

OGMCOAL DNR <ogmcoal@utah.gov>

Lila Canyon Mine- Federal Lease Modifications (Task #21793)

2 messages

Steve Christensen <stevechristensen@utah.gov> Tue, Nov 22, 2022 at 12:13 PM
To: Howard Strand <hstrand@osmre.gov>, Tom Medlin <tmedlin@osmre.gov>, Logan Sholar <lsholar@osmre.gov>, marcelo calle <mcalle@osmre.gov>, Elizabeth Shaeffer <eshaeffer@osmre.gov>, Charlie Kwak <ckwak@osmre.gov>, Erica Trent <etrent@osmre.gov>
Cc: OGMCOAL DNR <ogmcoal@utah.gov>, Dana Dean <danadean@utah.gov>, Justin Eatchel <jeatchel@utah.gov>

Good morning,

The Division has found the Lila Canyon Mines federal lease modification amendment to be administratively complete. I have provided the amendment with a Google-Drive link as well as attached our administrative completeness review worksheet. I reduced the PDF size of the amendment to hopefully make it a little more navigable. It's still a rather large file (53,935 KB). Please let me know if you have any difficulty opening/accessing the file.

At this time, the Division is requesting a federal mine plan review determination from OSMRE. If there is any additional information you need or questions that you may have, please feel free to contact me or Justin Eatchel (Lila Canyon Team Lead) 385 799-0029, jeatchel@utah.gov.

We look forward to working with you on this project.

Regards,
Steve

p.s. I hope you all have a wonderful and relaxing Thanksgiving.

11082022.21793.Reduced.pdf

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Steve Christensen
Coal Program Manager

M: (801) 538-5350
C: (385) 290-9937
E: stevechristensen@utah.gov

Utah Department of Natural Resources
Division of Oil, Gas & Mining

ogm.utah.gov

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ACRForm.pdf

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ogmcoal@utah.gov <ogmcoal@utah.gov> Tue, Nov 22, 2022 at 3:07 PM
To: stevechristensen@utah.gov, stevechristensen@utah.gov

Your message

To: stevechristensen@utah.gov
Subject: Lila Canyon Mine- Federal Lease Modifications (Task #21793)
Sent: 11/22/22, 12:13:12 PM MST

was read on 11/22/22, 3:07:31 PM MST

ADMINISTRATIVE COMPLETENESS REVIEW WORKSHEET
(R645-100)

DATE: 21 November 2022

REVIEWER(S): Justin Eatchel, Priscilla Burton, Todd Miller, Amanda Daniels, Kendra Hinton

APPLICANT: Emery County Coal Resources, Inc

MINE NAME: Lila Canyon Mine **TASK NO.:** 21793

"Administratively Complete Application" means an application for permit approval or approval for coal exploration, where required, which the Division determines to contain information addressing each application requirement of the State Program and to contain all information necessary to initiate processing and public review.

Directions: **The categories listed below correspond to the minimum requirements for information necessary to initiate processing and public review. If a category is checked the Applicant has met the Completeness requirement for that category. If a category is not checked, the Completeness requirements have not been met. If a category is Not Applicable, enter NA in check box. The comments column will identify the deficiency and what is necessary to correct it.**

			Comments
301-112	Identification of Interests	X	Ch. 1, Pg 1-1
100	Applicant's Business Structure	X	Ch. 1, Pg 1-1
210	Applicant's Name/Address/Phone	X	Ch. 1, Pg 1-2
220	Resident Agent's Name/Address/Phone	X	Ch. 1, Pg 1-3
230	Name/Address/Phone of AML Fees Payer	X	Ch. 1, Pg 1-2
300	Corporate Structure & Ownership	X	Ch. 1, Pgs 1-2 thru 1-5, Appx. 1-2
400	Identify Other Mining Operations in US	X	Ch. 1, Pg 1-4
500	Surface & Mineral Ownership	X	Ch. 1, Pg 1-4 thru 1-5
600	Ownership Contiguous to Permit	X	Ch. 1, Pg 1-6
700	MSHA Numbers	X	Ch. 1, Pg 1-6
800	Interest in Contiguous Lands	X	Ch. 1, Pg 1-6

301-113	Violation Information	X	Ch. 1, Pg 1-6
200	Suspension or Revocation Information	X	Ch. 1, Pg 1-6
300	List of Violations - **3 Previous Years**	X	Ch. 1, Pg 1-6
301-114	Right of Entry	X	Ch. 1, Pgs 1-6 thru 1-7, Appx. 1-7
301-115	Status of Unsuitability Claims	X	Ch. 1, Pg 1-11
301-116	Permit Term	X	Ch. 1, Pg 1-11
301-117	Insurance	X	Ch. 1, Pg 1-12
	Facilities and Structures Used in Common	X	Ch. 1, Pg 1-12
301-118	Filing Fee	X	Ch. 1, Pg 1-12
301-123	Notarized Signature of Responsible Official	X	Appx. 1-5
301-130	Information Collection: **Technical Data Accompanied by Names of Persons or Organizations that Collected and Analyzed the Data - Dates of Collections - and Analysis of the Data and Description of the Methodology Used to Collect and Analyze Data**	X	Ch. 1, Pgs 1-12 thru 1-13

301-200	Soils	X	
211	Description of Pre-mining Soil Resources	NA	
221	Prime Farmland Investigation	X	
222	Soil Survey	NA	
224	Substitute Topsoil Info (When Proposed)	NA	
230	Operation Plan **Topsoil Handling/Removal/Storage**	NA	
240	Reclamation Plan **Soil Redistribution/Stabilization**	NA	

301-300	Biology	X	
320	Vegetation Information	X	Ch. 3 p. 3, Appendix 3-1a
322	Fish and Wildlife Information	X	Ch. 3, p. 4, Appendix 3-8
323	Maps/Photos **Vegetation-Fish-Wildlife Areas**	X	Ch. 3 p. 12, Plate 3-2
330	Operation Plan **Vegetation-Fish-Wildlife Protection**	X	Ch. 3 p. 14
341	Reclamation Plan for Revegetation	X	Ch. 3 p. 23
342	Fish & Wildlife Plan for Reclamation Phase	X	Ch. 3 p. 28

301-400	Land Use and Air Quality	X	
411	Pre-Mining Land Use Information **(Includes Cultural Resources)**	X	Ch. 4 p. 2, Confidential File
412	Post-Mining Land Use Information	X	Ch. 4 p. 15

301-500	Engineering	X	
510 520	General Description of Operation Plan **(Maps, Locations, Cross-Sections, Narrative, Descriptions & Calculations)**	X	Ch. 5 Pgs 8 thru 32
522	Coal Recovery Description	X	Ch. 5 Pgs 32 thru 33
523	Mining Methods	X	Ch. 5 Pgs 33 thru 35
524	Blasting and Explosives Plan	X	Ch. 5 Pgs 36 thru 42
525	Subsidence Control Plan	X	Ch. 5 Pgs 42 thru 56
526	Mine Facilities Description **(Narrative, Plans, Maps)** **Including Existing Structures & Support Facilities**	X	Ch. 5 Pgs 57 thru 60
527	Transportation Facilities **(Including Plans & Maps)**	X	Ch. 5 Pgs 61 thru 62
528	Coal Mine Waste Plans **(Description & Designs)**	X	Ch. 5 Pgs 62 thru 65
529	Management of Mine Openings **(Design)**	X	Ch. 5 Pgs 65 thru 66
531	General Plans for Structures	X	Ch. 5 Pg 66
532	Sediment Control	X	Ch. 5 Pg 66
533	Impoundments	X	Ch. 5 Pgs 66 thru 67

301-534	Roads **(Plans, Drawings, Designs, & Specifications)**	X	Ch. 5 Pgs 67 thru 68
535	Spoil	X	Ch. 5 Pg 69
536	Coal Mine Waste	X	Ch. 5 Pgs 69 thru 70
537	Regraded Slopes	X	Ch. 5 Pg 70

540 541-542	Reclamation Narrative, Maps and Plans	X	Ch. 5 Pgs 70 thru 74
551	Casing and Sealing **Underground Openings**	X	Ch. 5 Pgs 73 thru 74, Appx. 5-6
553	Backfilling and Grading Description	X	Ch. 5 Pgs 74 thru 77

301-600	Geology	X	
621	Description of Geology **(Permit & Adjacent Area)**	NA	
622	Geologic Cross-Sections, Maps, and Plans	X	Updates made to Plate 6-1 through 6-5
630	Plans for Casing and Sealing Holes	NA	

301-700	Hydrology	X	
721	Description of Hydrologic Resources **(Permit and Adjacent Area)**	X	Appendix 7-12 has been added
722	Cross-Sections and Maps **Subsurface Water - Surface Water - Monitoring Stations - Wells**	X	Plates 7-1, 7-1a, 7-3, and 7-4 have been revised
723	Sampling and Analysis	X	Water monitoring Table 7-3 has been revised
724	Baseline Information **Ground Water - Surface Water - Geology - Climatological & Supplemental; If Needed**	x	Appendix 7-6 was update to include baseline sampling taken throughout 2022.
728	PHC Determination	X	Appendix 7-3 has been revised and Appendix 7-12 added
730	General Operation Plan **Minimize Disturbance to Hydrologic Balance & Compliance with Clean Water Act**	X	
731	Ground and Surface Water Protection	X	
732	Sediment Control Measures	X	No surface disturbance is proposed with this amendment

301-740	Plans and Designs **Operation and Reclamation Plan** **Sediment Control Measures**	X	No surface disturbance is proposed with this amendment
	Siltation Structures	X	
	Sediment Ponds	X	
	Other Treatment Facilities	X	
	Diversions	X	
	Road Drainage	X	
	Impoundments	X	
	Discharge Structures	X	
	Disposal of Excess Spoil	X	
	Coal Mine Waste	X	
	Disposal of Non-Coal Mine Waste	X	
	Casing and Sealing of Wells	X	

301-800	Bonding and Insurance	X	No disturbance proposed
820	Applicant **Have Adequate Bond at Permit Issuance**	X	Cover letter, MRP Ch. 8 Appx. 8-1
830	Bond Estimate and Calculations Provided	X	MRP Ch. 8 Appx. 8-1, pgs 16 thru 85
890	Certificate of Insurance Provided	X	MRP Ch. 8 Appx. 8-2

302-200	Special Categories of Mining	X	
210	Experimental Practices Mining	NA	
220	Mountaintop Removal Mining	NA	
230	Steep Slope Mining	NA	
240	Auger Mining	NA	
250	In Situ Processing Activities	NA	

302-260	Coal Processing Plants **(Not Located Within Permit Area of Mine)**	NA	
270	Variances From Approximate Original Contour Restoration Requirements	NA	
280	Variances for Delay in Contemporaneous Reclamation Requirement in Combined Surface and Underground Coal Mining Activities	NA	
290	Small Operator Assistance Program **(SOAP)**	NA	

302-300	Special Areas of Mining	X	
301	Prime Farmland	X	Appx. 2-1 States there are no Prime Farmlands anywhere within the permit.
302	Alluvial Valley Floors	X	Appx. 2-1 States there are no Prime Farmlands anywhere within the permit.

EMERY COUNTY COAL RESOURCES, INC.

Lila Canyon Mine
794 North 'C' Canyon Road
P.O. Box 910
East Carbon, UT 84520
Phone: (435) 888-4000
Fax: (435) 888-4002

November 4, 2022

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

Attn: Steve Christensen
Permit Supervisor

Re: Lila Canyon Mine, Emery County Coal Resources, Inc. C/007/013
Task # T-21793 Add Lease Modifications Turtle Canyon

Dear Mr. Christensen,

Please find attached the application to revise the Mining and Reclamation Plan (MRP) in order to add two (2) federal coal lease modifications to the permit area for the Lila Canyon Mine (Permit #C/007/013). These federal coal leases are #UTU-014218 (Tract 2) and #UTU-0126947 (Tract 2).

The lease modifications are currently included within the lease ownership data within the permit. This application seeks to add these lease modifications to the permit area so underground mining can proceed in these areas. The bonding for these lease modifications is currently included within the permit through previous submittals.

If you have any questions regarding this application, please feel free to call me directly at 435-650-1850.

Thank you for your time and attention.

Jesse Candelaria
Environmental Tech
Emery County Coal Resources, Inc.

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change ■ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: Emery County Coal Resources, Inc.

Mine: Lila Canyon Mine **Permit Number:** ACT/007/0013

Title: L22-005 task T-21793 Add Lease Mods Turtle Canyon

Description, Include reason for application and timing required to implement:

New lease modifications need to be added to the permit area to continue mining the reserve.

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

☒ Yes ☐ No 1. Change in the size of the Permit Area? Acres: 1256.53 Disturbed Area: _____ ■ increase ☐ decrease.
☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes ☒ No 6. Does the application require or include public notice publication?
☒ Yes ☐ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # _____
☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
☒ Yes ☐ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
☒ Yes ☐ No 13. Does the application require or include collection and reporting of any baseline information?
☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
☒ Yes ☐ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
☒ Yes ☐ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
☒ Yes ☐ No 19. Does the application require or include certified designs, maps or calculation?
☒ Yes ☐ No 20. Does the application require or include subsidence control or monitoring?
☒ Yes ☐ No 21. Have reclamation costs for bonding been provided?
☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach one (1) review copy 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.

Jese Candelaria — Print Name

Jese Candelaria — Environmental Tech. 11/4/2022
Sign Name, Position, Date

Subscribed and sworn to before me this 4th day of November, 2022

Stacy M Headley
Notary Public

My commission Expires: 1/9, 2023

Attest: State of Utah } ss:
County of Carbon

STACY M HEADLEY
NOTARY PUBLIC
STATE OF UTAH
COMMISSION # 703969
COMM. EXP. 01/09/2023

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APPLICATION FOR COAL PERMIT PROCESSING
Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: Emery County Coal Resources, inc.
Mine: Lila Canyon Mine **Permit Number:** ACT/007/0013
Title: L22-005 Task T-21793

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☐ Add	■ Replace	☐ Remove	Chapter 1 All Text and Tables
☐ Add	■ Replace	☐ Remove	Chapter 2 All Text and Tables
☐ Add	■ Replace	☐ Remove	Chapter 3 All Text and Tables
☐ Add	■ Replace	☐ Remove	Chapter 4 All Text and Tables
☐ Add	■ Replace	☐ Remove	Chapter 5 All Text and Tables
☐ Add	■ Replace	☐ Remove	Chapter 7 All Text and Tables
☐ Add	☐ Replace	☐ Remove	
■ Add	☐ Replace	☐ Remove	Appendix 1-2 Additional information
■ Add	☐ Replace	☐ Remove	Appendix 1-7 Additional information
■ Add	☐ Replace	☐ Remove	Appendix 1-9a New Appendix
■ Add	☐ Replace	☐ Remove	Appendix 1-9b New Appendix
■ Add	☐ Replace	☐ Remove	Appendix 1-10a New Appendix
■ Add	☐ Replace	☐ Remove	Appendix 3-1a New Appendix
■ Add	☐ Replace	☐ Remove	Appendix 3-8 New Appendix
■ Add	☐ Replace	☐ Remove	Appendix 4-4 New Appendix
☐ Add	■ Replace	☐ Remove	Appendix 7-3 Replace All
■ Add	☐ Replace	☐ Remove	Appendix 7-6 Additional information
■ Add	☐ Replace	☐ Remove	Appendix 7-12 New Appendix
☐ Add	☐ Replace	☐ Remove	
☐ Add	☐ Replace	☐ Remove	
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☐ Add	☐ Replace	☐ Remove	
☐ Add	☐ Replace	☐ Remove	

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

Appendix 1-2 Please place the additional information at the front of the current appendix.

Appendix 1-7 Please place the additional information at the back of the current appendix.

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APPLICATION FOR COAL PERMIT PROCESSING
Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: Emery County Coal Resources, Inc.
Mine: Lila Canyon Mine **Permit Number:** ACT/007/0013
Title: L22-005 Task T-21793 Add Lease Mods Turtle Canyon

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☐ Add	■ Replace	☐ Remove	Plate 1-1 Permit Area Map
☐ Add	■ Replace	☐ Remove	Plate 2-1 Soils Map
☐ Add	■ Replace	☐ Remove	Plate 3-1A Wildlife Habitat - Raptors Confidential
☐ Add	■ Replace	☐ Remove	Plate 3-1B Wildlife Habitat - Big Horn Sheep / Proghorn Antelope
☐ Add	■ Replace	☐ Remove	Plate 3-1C Wildlife Habitat - Elk
☐ Add	■ Replace	☐ Remove	Plate 3-1D Wildlife Habitat - Mule Deer
☐ Add	■ Replace	☐ Remove	Plate 3-2 Vegetation Map
☐ Add	■ Replace	☐ Remove	Plate 4-1 Surface Ownership Map
☐ Add	■ Replace	☐ Remove	Plate 4-2 Grazing Alottments
☐ Add	■ Replace	☐ Remove	Plate 4-3 Cultural Resources Map CONFIDENTIAL
☐ Add	■ Replace	☐ Remove	Plate 4-4 Federal Wilderness
☐ Add	■ Replace	☐ Remove	Plate 5-1 Previously Mined Areas
☐ Add	■ Replace	☐ Remove	Plate 5-3 Subsidence Control Map
☐ Add	■ Replace	☐ Remove	Plate 5-3a Subsidence Control Map with Raptor Data CONFIDENTIAL
☐ Add	■ Replace	☐ Remove	Plate 5-4 Coal Ownership Map
☐ Add	■ Replace	☐ Remove	Plate 5-5 Mine Map with Projections
☐ Add	■ Replace	☐ Remove	Plate 6-1 Project Area Geologic Map
☐ Add	■ Replace	☐ Remove	Plate 6-2 General Geology Map
☐ Add	■ Replace	☐ Remove	Plate 6-3 Coal Thickness Isopachs
☐ Add	■ Replace	☐ Remove	Plate 6-4 Cover and Structure Map
☐ Add	■ Replace	☐ Remove	Plate 6-5 Coal Sections
☐ Add	■ Replace	☐ Remove	Plate 7-1 Permit Area hydrology
☐ Add	■ Replace	☐ Remove	Plate 7-1a Permit Area hydrology / Geology Map
☐ Add	■ Replace	☐ Remove	Plate 7-3 Water Rights map
☐ Add	■ Replace	☐ Remove	Plate 7-4 Water Monitoring Locations Map
☐ Add	☐ Replace	☐ Remove	
☐ Add	☐ Replace	☐ Remove	
☐ Add	☐ Replace	☐ Remove	

Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.	**Received by Oil, Gas & Mining**

CHAPTER 1

LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

Emery County Coal Resources, Inc.
Lila Canyon Mine

~~May 2021~~
July 2022

CHAPTER 1
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CHAPTER 1

LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

1.1.0 Minimum Requirements

1.1.1 Introduction

This chapter provides information regarding ownership and control of the Lila Canyon Mine, located approximately 28 miles southeast of Price, Utah (see Plate 1-1). The compliance status of the operator at other locations is also provided herein.

The Lila Canyon Mine underwent a change in ownership on September ~~15~~16, 2020. Therefore, this chapter also provides information pursuant to R645-030-300 of the Utah Administrative Code regarding the transfer of permit rights associated with that change in ownership. Documentation regarding the transfer of these permit rights from UtahAmerican Energy, Inc. (the former owner) to Emery County Coal Resources, Inc. (the current owner) is provided as part of the Asset Purchase Agreement provided in Appendix 1-1.

1.1.2 Identification of Interests

The applicant and operator of the Lila Canyon Mine is Emery County Coal Resources, Inc. (hereinafter referred to as "ECCR"). The corporate structure associated with ECCR is indicated in Figure 1-1. ECCR is wholly (100%) owned by ACNR Mining Corporation which itself is wholly owned by American Consolidated Natural Resources, Inc. which itself is wholly owned by Murray American Consolidated Natural Resources Holdings, Inc. which itself is wholly owned by ACNR Holdings, Inc. Invesco Oppenheimer Senior Floating Rate Fund, a publicly-traded fund, is the only entity that owns more than 10% of ACNR Holdings, Inc. No person owns 10% or more of Invesco Oppenheimer Senior Floating Rate Fund. ECCR is a Delaware corporation registered to do business in the State of Utah.

1.1.2.1 Business Entity

ECCR, ACNR Mining Corporation, American Consolidated Land Resources, Inc., Murray American Consolidated Natural Resources Holdings, Inc., and ACNR Holdings, Inc. are all corporations organized under the laws of the State of Delaware.

1.1.2.2 Applicant and Operator

The applicant and operator for this permit application is:

Emery County Coal Resources, Inc.
46226 National Road
St. Clairsville, OH 43950
Facility Phone: (435) 888-4000
Headquarters Office Phone: (740) 338-3100

Payment of abandoned mine land reclamation fees, if any, will be the responsibility of the President of ECCR. Inquiries regarding the payment of this fee should be directed to this individual at the mailing address and phone number indicated above. The person currently occupying this position is indicated in Section 1.1.2.3.

1.1.2.3 Officers and Directors

The officers and directors of ECCR (FEIN 85-1504720), American Consolidated Natural Resources, Inc. (FEIN 85-1621594), and ACNR Mining Corporation (FEIN 85-1468710) are:

Name	Title	Date position was assumed
Robert D. Moore	Director	11 Sep 2020
James R. Turner, Jr.	President	11 Sep 2020
Anthony C. Vcelka, II	Treasurer	11 Sep 2020
F. Andrew Balcar	Secretary	11 Sep 2020
Guy Shelledy	Vice President, Engineering	11 Sep 2020

The officers and directors of ~~Murray~~ American Consolidated Natural Resources Holdings, Inc. (FEIN 85-1621749) are:

Name	Title	Date position was assumed
Robert D. Moore	Director, President, CEO	11 Sep 2020
Anthony C. Vcelka, II	Treasurer	11 Sep 2020
F. Andrew Balcar	Secretary	11 Sep 2020
Jeremy J. Harrison	Chief Financial Officer	11 Sep 2020
James R. Turner, Jr.	Chief Operating Officer	11 Sep 2020
Jason Adkins	Vice President, Human Resources	29 Jan 2021
Eric Grimm	Exec. Vice President, Operations	11 Sep 2020

The officers and directors of ACNR Holdings, Inc. (FEIN 85-1622371) are:

Name	Title	Date position was assumed
Robert D. Moore	Director, President, CEO	11 Sep 2020
Eugene I. Davis	Director	10-11-2020
Eugene I. Davis	Chairman of the Board	10-19-2010
Rafael Wallander	Director	10-19-2020
Robert E. Murray	Director	11 Sep 2020 End 10-16-20
Phillip J. Cavatoni	Director	11 Sep 2020
Richard D. Robinson	Director	11 Sep 2020
Jeffrey Ogden	Director	11 Sep 2020
Lawrence M. Clark, Jr.	Director	11 Sep 2020
Anthony C. Vcelka, II	Treasurer	11 Sep 2020
F. Andrew Balcar	Secretary	11 Sep 2020
Jeremy J. Harrison	Chief Financial Officer	11 Sep 2020
James R. Turner, Jr.	Chief Operating Officer	11 Sep 2020
Jason Adkins	Vice President, Human Resources	29 Jan 2021
Eric Grimm	Exec. Vice President, Operations	11 Sep 2020

All officers and directors are active in the companies listed above. Paul B. Piccolini served as Vice President of Human Resources for Murray American Consolidated Natural Resources Holdings, Inc. and ACNR Holdings, Inc. from September 11, 2020 until January 29, 2021. Coal mining and reclamation operations with which the above officers and directors have been involved within five years preceding the date of this application are detailed Appendix 1-2.

The addresses and phone numbers for the officers and director of ECCR, ACNR Mining Corporation, American Consolidated Natural Resources, Inc., Murray American Consolidated Natural Resources Holdings, Inc., and ACNR Holdings, Inc. are the same as those of the applicant. None of the officers or directors of ACNR Holdings, Inc. or any of its tiered subsidiaries have an ownership position in any of those companies.

Written correspondence to ECCR regarding the operations should be addressed to:

~~PJ Jensen~~Jesse Candelaria, Resident Agent
Emery County Coal Resources, Inc.
P.O. Box 910
East Carbon, UT 84520-0910
Phone: (435) 888-4026

1.1.2.4 Coal Mining and Reclamation Operation Permit Applications

The following list represents permits issued to ECCR, along with applicable identification numbers of those permits:

Permit	Issuing Authority	Status
UPDES Permits (Minor Municipal Permit No., UT0026018, Biosolids Permit No. UTL0000000, Sedimentation Pond Permit No. UTG040024)	Utah Dept. Environmental Quality, Division of Water Quality	Approved
Certificate of Insurance and Business Authorization	Utah Industrial Development Commission	Approved
Mining and Reclamation Permit No. (C007013)	Utah Department of Natural Resources, Division of Oil, Gas and Mining	Update Pending

No other mining permits have been filed by the applicant or operator in any State in the United States.

1.1.2.5 Legal or Equitable Owner of the Surface and Mineral Properties to be Mined

A surface property ownership map of the permit and contiguous areas is presented as Plate 4-1. Contact information for the indicated surface owners and/or managers of record is as follows:

Josiah K Eardley
2433 S HWY 10
Route 1, Box 119
Price, Utah 84501

~~Bronco Coal Company~~
~~P.O. Box 217~~
~~Cleveland, Utah 84518~~

Emery County Coal Resources, Inc.
46226 National Road
St. Clairsville, Ohio 43950

U.S. Bureau of Land Management
Utah State Office
324 South State
Salt Lake City, Utah 84111

Utah School and Institutional Trust Lands Administration (SITLA)
675 East 500 South Suite 500
Salt Lake City, Utah 84114-5703

~~College of Eastern~~Lyman Family Farm, Inc.
3940 North Traverse Mountain Boulevard #200
Lehi, Utah ~~Foundation~~84043
~~451~~
First Light Development, LLC
2910 Glenbriar Drive
St. Charles, Illinois 60174

William Marsing Livestock, Inc.
4330 East ~~400 North~~8900 South
Price, Utah 84501

The owners of subsurface minerals within the permit and contiguous areas are shown on Plate 5-4. Contact information for the indicated subsurface owners and/or managers of record is as follows:

Emery County Coal Resources, Inc.
46226 National Road
St. Clairsville, Ohio 43950

~~Bronco Coal Company~~
~~P.O. Box 217~~
~~Cleveland, Utah 84518~~

Utah School and Institutional Trust Lands Administration (SITLA)
675 East 500 South Suite 500
Salt Lake City, Utah 84114-5703

U.S. Bureau of Land Management
Utah State Office
324 South State
Salt Lake City, Utah 84111

~~College of Eastern~~Lyman Family Farm, Inc.
3940 North Traverse Mountain Boulevard #200
Lehi, Utah ~~Foundation~~84043
~~451 East 400 North~~
~~Price, Utah 84501~~

First Light Development, LLC
2910 Glenbriar Drive
St. Charles, Illinois 60174

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No area within the lands to be affected by operations at the Lila Canyon Mine is under a real estate contract. ECCR's right to enter the property and conduct operations thereon is not the subject of current litigation.

1.1.2.6 Owners of Record of Property Contiguous to Proposed Permit Area

~~In addition to some of the surface~~The owners of record ~~within the permit area, the following owner~~ of surface lands ~~is~~ contiguous to the permit area boundary~~:~~ are listed in Section 1.1.2.5, and shown on Plate 4-1.

~~William Marsing Livestock, Inc.~~
~~4330 E 8900 N~~
~~Price, Utah 84501~~

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1.1.2.7 MSHA Numbers

The following MSHA identification numbers are associated with the Lila Canyon Mine:

Horse Canyon:	42-00100
Lila Canyon:	42-02241
Refuse Pile:	1211-UT-09-02241-01

1.1.2.8 Interest in Contiguous Lands

The applicant ~~neither~~ owns ~~nor controls, directly or indirectly,~~ a legal equitable interest in ~~any~~those lands contiguous to the permit area shown on Plate 4-1 as being owned by ECCR.

1.1.3 Violation Information

Neither ECCR nor any of its affiliates having any interest, either legal or equitable, in the Lila Canyon Mine site have had a State or Federal mining permit suspended or revoked in the five years preceding the date of submission of this application, or have forfeited a performance bond or similar security deposited in lieu of bond revoked. There are no outstanding Notices of Non-compliance associated with mining, air, or water permits issued to ECCR or related entities. Within the past three years, ECCR has had no violation notices or cessation orders pertaining to air or water environmental protection laws, rules, or regulations promulgated by United States or individual State governments in connection with any coal mining and reclamation operation.

1.1.4 Right-of-Entry Information

A copy of the purchase agreement conveying the assets of certain subsidiaries of Murray Energy Holdings, Inc to American Consolidated Natural Resources, Inc. (also known as the Stalking

Horse Agreement) is provided in Appendix 1-1. This agreement included right-of-entry to the assets which are now held by ECCR. The Agreement was approved by Order dated August 31, 2020 issued by the U.S. Bankruptcy Court for the Southern District of Ohio in re Murray Energy Holdings Co. et al., Case No. 19-56885. A copy of the Assignment to ECCR from Murray Energy Holdings Co., dated as of September 16, 2020 and recorded on September 24, 2020 as Entry No. 423463 in the official records of Emery County, Utah, is provided in Appendix 1-8. Assignments of Federal and State leases allowing ECCR right-of-entry to Lila Canyon Mine resources are provided in Appendix 1-9 and Appendix 1-10, respectively. Copies of the federal coal leases are provided in Appendix 1-9a and 1-10a, respectively.

In 2021, Emery County Coal Resources, Inc. obtained modifications to federal coal leases #UTU-014218 and #UTU-0126947. The land and coal located within these federal leases is owned and managed by the United States Bureau of Land Management (BLM). Only portions of these coal lease modifications are a part of the permit area, as noted on Plates 4-1 and 5-4. Copies of the lease modification documents are included within Appendix 1-9a. An environmental assessment (EA) addressing modifications to Federal Coal Leases #UTU-014218 and #UTU-0126947 is provided in Appendix 1-9b.

Correspondence from the U.S. Bureau of Land Management is provided in Appendix 1-6 and Appendix 1-7 regarding the right of entry to the Federal lease areas associated with the Lila Canyon Mine. The Lila Canyon Mine is located on lands for which ECCR has a right of entry. The disturbed area associated with the Lila Canyon Mine is delineated on Plate 1-2. ECCR currently holds approximately ~~8,206.468~~224.86 acres of State and Federal coal leases, rights-of-way, and surface area access rights as indicated on Plates 4-1 (Surface Ownership) and 5-4 (Coal Ownership) and further described in Table 1-1. An additional coal lease ~~and right-of-way~~ (totaling approximately 4,~~209.86~~191.46 acres) ~~are~~is pending, as indicated in Table 1-1.

TABLE 1-1
Summary of Surface and Subsurface Entry Rights
Associated with the Lila Canyon Mine

Lease Type	Original Effective Date	Lease Number	Description	Rights Claimed
Federal Lease	19 Jun 1946	UTSL-066l45	1404.20 Acres; Twp. 16S/Rng. 14E Sec. 3: NE¼SW¼, SE¼ Sec. 3: Lots. 1-3, 7-~~1~~ ~~1~~11 Sec. 10: E½ Sec. 11: W½ Sec. 14: NW¼ Sec. 15: N½NE¼, SE¼NE¼	Underground mining and surface access
Federal Lease	1 Dec 1963	UTU-0126947 Tract 1	1059.81 Acres; Twp. 16S/Rng. 14E Sec. 13: E½	Underground mining and surface access

Lease Type	Original Effective Date	Lease Number	Description	Rights Claimed
			Sec. 24: E½ Sec. 25: N½NE¼, SE¼NE¼ Twp. 16S/Rng. 15E Sec. 19: Lots 3-4 Sec. 19: SE¼SW¼ Sec. 30: Lots 1, 2 Sec. 30: E½ NW¼, SW¼NE¼	
Federal Lease	1 March 2021	UTU-0126947 Tract 2	954.80 Acres; Twp. 16S/Rng. 15E Sec. 18: S½SE¼SW¼, SW¼SW¼SE ¼ Sec. 19: Lot 2, W½NW¼NE¼, SE¼NW¼NE¼, SW¼NE¼, E½NW¼, W½SE¼, SE¼SE¼, W½NE¼SE¼, NE¼SW¼ Sec. 29: S½NW¼, SW¼NW¼NW¼, SW¼, W½SW¼SE¼, SW¼NW¼SE¼ Sec. 30: SE¼, N½NE¼, SE¼NE¼	Underground mining and surface access
Federal Lease	31 Dec 1947	UTSL-066490 Tract 1	2440.00 Acres; Twp. 16S/Rng. l4E Sec. 11: E½ Sec. 12: W½ Sec. 13: W½ Sec. 14: E½, SW¼ Sec. 15: E½SE¼ Sec. 22: NE¼NE¼ Sec. 23: N½, E½SW¼, SE¼ Sec. 24: NW¼, W½SW¼ Sec. 26: N½NE¼	Underground mining and surface access
Federal Lease	1 June 2011	UTSL-066490 Tract 2	5.00 Acres; Twp. 16S/Rng. 14E Sec. 15: SE¼SE¼NW¼SE¼, NE¼NE¼SW¼SE¼	Underground mining and surface access
Federal Lease	1 Feb 1955	UTU-014217	40.00 Acres; Twp. 16S/Rng. l4E Sec. 25: SW¼ NE¼	Underground mining and surface access
Federal Lease	1 Feb 1955	UTU-014218 Tract 1	320.00 Acres; Twp. 16S/Rng. l4E Sec. 12: E½	Underground mining and surface access
Federal Lease	1 March 2021	UTU-014218 Tract 2	317.84 Acres; Twp. 16S/Rng. 15E Sec. 7: Lot 4 Sec. 18: Lots 1 – 4, W½NE¼NW¼, W½SE¼NW ¼, SE¼SE¼NW¼, NE¼SW¼,	Underground mining and surface access

Lease Type	Original Effective Date	Lease Number	Description	Rights Claimed
			N½SE¼SW¼ Sec. 19: Lot 1	
Federal Lease	1 Apr 1950	UTSL-069291	280.00 Acres; Twp. 16S/Rng. 14E Sec. 24: E½SW Sec.25: NW¼ Sec. 26: SE¼NE¼	Underground mining and surface access
Federal Lease	N/A (Appl. Date 1 Mar 2002)	UTU-80043 Williams Draw LBA (Pending)	4191.46 Acres Twp. 16S/Rng. 14E Sec. 25: S½ Sec. 26: SE¼ Sec. 35: NE¼ Twp. 17S/Rng. 14E Sec. 1: lots 1-3, 6-8, S½NE¼, SE¼NW¼, E½SW¼, SE¼ Sec. 12: NE¼, E½NW¼, NE¼SW¼, N½SE¼ Twp. 16S/Rng. 15E Sec. 30: Lots 3, 4, E½SW¼ Sec. 31: All Twp. 17S/Rng. l5E Sec. 5: Lots 3, 4, SW¼, S½NW¼ Sec. 6: All Sec. 7: All Sec. 8: W½	Underground mining and surface access
State Lease	1 Oct 2018	ML-53812-OBA	1280.00 Acres; Twp. l6S/Rng. 14E Sec. 36: ALL Twp. 16/Rng. l5E Sec. 32: ALL	Underground mining and surface access
Federal ROW	27 Jul 2001	UTU-77122 ROW	40.00 Acres Twp. 16S/R. l4 E Sec. 15: NW¼SE¼, S½SE¼, E½SW¼	Surface access (Surface Facilities)
Federal ROW	7 Apr 2010	UTU-087514 ROW	54.60 Acres Twp. 17S/R.13E Sec. l: S½SE¼ Sec. 12: W½NE¼, E½SW¼, SW¼SW¼ Twp. 16S/R. l4E Sec. 15: S½SW¼ Sec. 21: N½NE¼, SW¼NE¼, E½SW¼, SW¼SW¼ Sec. 28: W½W½ Sec. 29 SE¼SE¼ Twp. 17S/R.14E Sec. 6: SE¼NW¼ Sec. 6: Lots 2, 3, 5, 6, 7	Surface access (138kV Power Line)
Federal ROW	4 Feb 2011	UTU-088259 ROW	0.413 Acre Twp. 17S/Rng. l3E Sec. 12: SE¼SW¼	Surface access Transrupter Station)

Lease Type	Original Effective Date	Lease Number	Description	Rights Claimed
Federal ROW	7 Apr 2010	UTU-087862 ROW	3.00 Acres Twp. 17S/R. 13E Sec. 12: SE¼SW¼ Sec. 13: W½NE¼, SE¼NE¼, NE¼NW¼ Twp. 17S/R. 14E Sec. 18: Lots 3, 4 Sec. 19: Lots 1, 2 Sec. 19: SE¼NW¼, NE¼SW¼	Surface access (Transrupter Station Road)
Federal ROW	25 Oct 2016	UTU-091789 ROW	2.50 Acres Twp. 16S/R. 14E Sec. 15: SE¼SW¼	Surface access (Roadway and Pond #1 Dam)
Federal ROW	15 Sep 2010	UTU-088125 ROW	4.30 Acres Twp. 16S/R. 14E Sec. 15: S½SW¼ Sec. 21: N½NE, ¼ SW¼NE¼, E½SW¼, SW¼SW¼ Sec. 28: W½W½ Sec. 29: SE¼SE¼ Twp. 17S/R. 14E Sec. 6: SW¼NW¼ Sec. 6: Lots 2,3,5,6,7	Surface access (Overhead Fiber Optic Line)
Federal ROW	~~N/A (Appl. Date 6 Aug. 2020)~~30 Nov 2021	UTU-095176 ROW ~~(Pending)~~	18.40 Acres Twp. 16S/Rng.14E; Portions of: Sec. 3: SE¼NE¼SE¼, N½SE¼ Sec. 10: SW¼NE ¼, E½NW¼, N½SE¼ Sec. 14: SW¼NW¼, N½SW¼, SE¼SW¼ Sec. 23: N½NE¼, SE¼NE¼ Sec. 24: NW¼SW¼, SW¼SW¼, SE¼SE¼SW¼ Sec. 25: W½NW¼, NW¼SE¼, SW¼SE¼	Surface access

The total permit area associated with the Lila Canyon Mine is ~~4,664.32~~5,920.85 acres as shown on Plate 1-1. The permit area is described as follows:

T16S R14E

Section 10: Portions of SE1/4
Section 11: E1/2 and portions of W1/2
Section 12: All
Section 13: All
Section 14: All
Section 15: Portions of E1/2 and portions of SW1/4
Section 22: NE1/4 NE1/4
Section 23: N1/2, SE1/4, and E1/2 SW1/4
Section 24: All
Section 25: N1/2

Section 26: E1/2 NE1/4

T16S R15E

Section 18: Lots 3 and 4, S1/2SE1/4SW1/4, and SW1/4SW1/4SE1/4
Section 19: Lots 1 - 4, E1/2W1/2, SW1/4NE1/4, S1/2NW1/4NE1/4, NW1/4NW1/4NE1/4, W1/~~2 SW1~~2SE1/4 ~~and~~, SE1/~~4 SW1~~4SE1/4, and W1/2NE1/4SE1/4
Section 29: SW1/4NW1/4 and W1/2NW1/4NW1/4
Section 30: ~~NW1/4~~Lots 1 and ~~SW1~~2, E1/2NW1/4, and NE1/4

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1.1.5 Status of Unsuitability Claims

The permit area is not located within an area that has been designated as unsuitable for mining and reclamation operations, nor is it within an area under study for designation in an administrative proceeding under R645-103-300, R645-103-400, or 30 CFR Part 769.

ECCR will not conduct mining operations within 300 feet of a currently occupied dwelling but ~~-~~will conduct mining or mining-related activities within 100 feet of a public road. A letter from Emery County providing permission to construct facilities and operate coal mining activities within 100 feet of a public road is provided in Appendix 1-4.

1.1.6 Permit Term

It is anticipated that this permit will be for a term of 5 years. Operations for recovery of coal from the Lila Canyon Mine are determined by economic and working conditions. The timing of termination of mining is, therefore, unknown. The anticipated total acreage to be affected during the permit term is ~~37.02~~40.11 acres.

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1.1.7 Insurance and Proof of Publication

A Certificate of Insurance issued to ECCR is provided in Appendix 1-5. The following announcement will be published in the ETV News, a newspaper of general circulation in Carbon and Emery Counties, following notification that the Division had determined that this permit application is administratively complete. This announcement will be published at least once a week for four consecutive weeks. Proof of publication of this announcement will be provided in Appendix 1-5.

NOTICE OF PERMIT APPLICATION
EMERY COUNTY COAL RESOURCES, INC.

Notice is hereby given that Emery County Coal Resources, Inc., 46226 National Road St. Clairsville, OH 43950, has submitted an application to the Utah Division of Oil, Gas and Mining (the "Division") to recover coal from the Lila Canyon Mine located approximately 28 miles southeast of Price, Utah. The disturbed area for this facility is located in Section 15, Township 16 S., Range 14 E., SLBM and contains approximately 37.02 acres.

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The Division has determined that this application is administratively complete. A copy of the permit application is available for public inspection at the following location:

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

Written comments, objections, or a request for an informal conference regarding the above application should be directed to the Division at the above address within the next 30 days.

1.1.8 Filing Fee

The permit filing fee was paid upon submittal of the application.

1.2.0 Permit Application Format and Contents

The permit application contains clear, concise, current information, in the format of the DOGM regulations.

1.3.0 Reporting of Technical Data

All technical data submitted in the permit application is accompanied by the names of persons or organizations that collected and analyzed the data. The technical data also contains the dates of collection and analysis of the data, and descriptions of the method used to collect and analyze

data, as indicated in subsequent sections of this application. Professionals qualified in the subject planned or directed the technical analyses.

1.4.0 Maps and Plans

The maps submitted in this permit application comply with the format required by the regulations. The permit area boundary shown on the maps submitted in this permit application is an approximate but adequate representation of that boundary.

1.5.0 Completeness

The Applicant believes the information in this application to be complete and correct.

FIGURES

APPENDIX 1-1

Asset Purchase Agreement and
Permit Transfer Documentation

APPENDIX 1-2

Current and Previous Coal Mining Permits

APPENDIX 1-8

Assignment of Leases from Murray Energy Holdings
to Emery County Coal Resources

APPENDIX 1-9

Federal Lease Assignment

APPENDIX 1-9a

Federal Coal Leases

APPENDIX 1-9b

Environmental Assessment
for
Lease Modifications to Federal Coal Leases
#UTU-014218
and
#UTU-0126947

APPENDIX 1-10

State Lease Assignment

APPENDIX 1-10a

State Coal Leases

Horse Canyon Extension
Lila Canyon Mine

Chapter 2
Soils

Volume 1 of 7

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Appendix 2-2 Soil Descriptions NRCS
Appendix 2-3 Soil Survey (1998)
Appendix A1 Detailed Soil Survey Map
Appendix A2 Salvaged Soils Map

R645-301-200. Soils.

210. Introduction.

211. Premining soil sources description.

212. Information in this chapter includes soil characteristics, chemical and physical analyses, and their interpretations for soils management and reclamation plans. Information is both qualitative and quantitative in nature.

Evaluation of suitable soil materials, stockpiling, and reclamation procedures are presented in section 220, 230, 240 and 250.

220. Environmental Description.

Environmental setting:

The proposed Lila Canyon Mine location is in eastern Emery County, Utah on the east side of the Price River drainage basin at the western edge of the Book Cliffs. The Book Cliffs are oriented northwest-southeast in the vicinity of the proposed permit area. The mine surface facilities would be located at the mouth of Lila Canyon, mostly on an alluvial pediment surface. Lithology is primarily sedimentary rocks of sandstone and shale. Below the steep slopes of the Book Cliffs are alluvial pediments and shale exposures. The elevation differences in the area of the mine site range from approximately 5,800 at the mouth of Lila Canyon to over 8,800 feet on top of Lila Point. Elevations of the proposed mine facilities site range from 5,800 feet to 6,500 feet.

The average annual precipitation in the area of the mine site is 12-14 inches with the majority of the precipitation occurring from October to March. The mean annual air temperature is 45-47 degrees F and the average frost-free period is 80 to 120 days. The basic vegetation is a pinyon-juniper and grass type.

221. Prime Farmland Investigation.

A Prime Farmland Investigation was conducted by Leland Sasser, Soils Scientist for the USDA Natural Resource Conservation Service (NRCS) in January of 1998. Mr. Sasser confirmed that no such lands are present

with the described permit area. This is due to the lack of a developed irrigation system on the arid soils present, as well as the high erodibility of soils present within the area. It has been determined that no alluvial valley floors are present on the proposed disturbed areas of the Lila Canyon Mine Project. This determination was made by the use of detailed soil surveys and site observations. Also, the order 3 intensity level soil survey by the National Resources Conservation Services shows no alluvial valley floors in the area. A copy of these negative determinations is included as Appendix 2-1.

A determination of "not present" was determined for the areas of modifications to Federal Coal leases #UTU-014218 and #UTU-0126947. See page A-3 of Appendix A of the environmental assessment for these lease modifications (Appendix 1-9b).

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222. Soil Survey.

222.100. An order 3 intensity level soil survey for Emery County is currently in progress by the USDA, National Resources Conservation Service (NRCS). Soil mapping at a scale of 1:24,000, along with map unit descriptions, has been provided by NRCS to cover the entire Lila Canyon Mine project area. This soil map is presented as Plate 2-1. The detail is suitable for general planning and evaluation purposes over the mining project area.

Since more specific information was needed for the area to be disturbed at the proposed mine facilities site; a detailed soil survey was conducted by Daniel Larsen, Soil Scientist, Environmental Industrial Services in August 1998. Additional information was collected near the ventilation break outs on June 15, 1999. The detailed soil survey report is presented in Appendix 2-3. A soils map, soil descriptions, and laboratory soil testing data are included. The detailed soils map for the mine facilities site (disturbed area) is presented in Plate 2-2.

222.200. Soil types for the proposed project area are identified on Plate 2-1 and in Appendix 2-3. At the mine facilities site the dominant soil is the Strych series. The order 3 intensity soil survey information provided by the Natural Resources Conservation Service identifies four soil map units at the mine surface facilities site:

BNE2 Strych very bouldery, fine sandy loam, 3 to

20 percent slopes

BMD Strych very stony fine sandy loam, 3 to 30 percent slopes

NGG2 Gerst-strych-badland complex, 30 to 70 percent slopes

RZH Rock outcrop-Atchee-Rubbleland Complex

The detailed soil survey of the facilities site identifies six soil map units:

SBG - Strych boulder fine sandy loam, 5 to 15 percent slopes (grass)

VBJ - Strych very bouldery fine sandy loam 5 to 15 percent slopes (juniper)

XBS - Strych extremely bouldery sandy loam, 10 to 45 percent slopes

RBL - Rubbleland-Strych-Gerst complex, 20 to 70 percent slopes

DSH - Strych fine sandy loam variant, 3 to 8 percent slopes

RBT - Rock outcrop - Travessilla family complex.

These unit designations are specific to this inventory. The Travessilla family has been revised by NRCS and based the changes the Atchee series is more appropriate in Map Unit RBT (personal conversation with Leland Sasser. July, 1999).

Permit Area “B” Soils

Soils in Permit Area “B” include the following Soil Map Units identified in the Soil Survey of the Emery Area, Utah by the Natural Resource Conservation Services:

	DHG2	Comodore-Datino Complex

DSG 2 (HUG)	Midfork-Tingey-Comodore Complex
GNA	Neto fine sandy loam
KXH	Podo-Rock outcrop Complex
MHE (MSC)	Podo sandy loam, 1 to 8 percent slopes
MRG	Vassilla-Rock outcrop-Gerst Association
MTH	Cabba-Guben-Rock outcrop Complex
MUE	Cabba-Podo-Doney Complex
NGG2	Gerst-Strych-Badland Complex
NVF2	Gerst-Rubbleland-Badland
NXC	Lazear-Rock outcrop Complex, High rainfall
RR	Rock outcrop
RWG	Rock outcrop-Rubbleland-Vassilla Complex
RZH	Rock outcrop-Atchee-Rubbleland Complex
UMF2	Guben-Pathead-Rabbitex Association
VOH	Guben-Rock outcrop Complex

222.300. Soil descriptions from the NRCS order 3 mapping are contained in Appendix 2-2. Soil descriptions from the detailed soil survey of the facilities site are given in Appendix 2-3.

The soils at the proposed Lila Canyon mine facilities site have formed dominantly in deep, stony and bouldery deposits on an alluvial fan and adjacent mountain toe slopes under a semi-arid climate. Rock fragments (gravel to boulders) are composed almost entirely of sandstone.

Notable features related to soils at the site are the high percentage of stones and boulders that are present on the surface and the relatively hot and dry site conditions. Minimal topsoil development and an accumulation of carbonates in the subsoil are typical characteristics of these soils along with a high rock fragment content. Soil textures are typically fine sandy loam or sandy loam. Thin layers of sandy clay loam and loamy sand are intermittently present.

The dominant soils are well drained and have moderately rapid permeability. Soil erosion potential is moderately low over most of the area, but ranges from low to severe (on shale exposures). Rooting depths observed were mostly at 30 to 48 inches.

222.400 Present and potential productivity determinations of the existing soils conducted by Mr. George Cook of the NRCS in the summer of 1998 are presented in Appendix 3-2.

223. The soil survey was conducted according to the standards of the National Cooperative Soil Survey as described in the Soil Survey Manual (Soil Survey Staff, 1993), the National Soil Survey Handbook, (soil Survey Staff, 1993), and Keys to Soil Taxonomy, seventh edition (Soil Survey Staff, 1996).

224 Soil inventories indicate that no borrow area will be needed for substitute topsoil. There is an adequate amount of suitable soil as indicated by root distribution and soil characteristics over the proposed area to be disturbed.

230. Operation Plan.

231. General Requirements.

231.100 In reference to topsoil in this plan, it is considered to be the soil down to a maximum depth of 18". The typically dark colored A horizon often referred to as topsoil is very thin (< 6 inches) under the environmental conditions of the project site. Topsoil generally consists of the A and B horizon materials that have suitable characteristics for plant growth and show natural rooting present within the soil. Of the salvageable soil identified, the upper 6 to 12 inches is the most suitable. Below this depth, there is generally an increase in carbonates and rock fragments. However, this layer supports plant roots and is not considered as substitute topsoil in this case.

Where topsoil is to be salvaged, the soils will be removed with one or more of the following types of equipment: crawler-tractor, grader, front-end loader, and/or trackhoe. A soil scientist will provide on-site consultation during the topsoil removal process to maximize harvest of quality topsoil. Topsoil material will be hauled by truck and stockpiled at designated storage areas located near, but away from the mine yard. This will allow the soil materials to be located away from mining activities to minimize the potential impacts from mine-related activities. The storage areas will be located away from any drainage areas. Drainage ditches will be located along the sides of the stockpiles to divert drainage away from the stockpile surface. Drainage will be diverted by ditches to the downslope end of the stockpile and will be treated by silt fences prior to entering the undisturbed drainage. Refer to Plates 5-2 and 5-7 for the location of the proposed topsoil storage area. Refer to Appendix 7-4 for details of the drainage control designs proposed for these alternate sediment control areas (ASCAs).

During stripping and handling the soils will be in a loose or friable condition. If the soil sticks to the equipment, the soil will be allowed to dry to a friable state prior to removable. If the soil is too dry and hard to handle, water will be added until the soil is wetted to a loose and friable condition.

The stockpiled material will be loosely piled and have an irregular, pitted surface to help retain runoff from precipitation events and to reduce erosion.

The stockpile will be seeded and mulched during the first favorable period for revegetation. Species selected would give an effective, quick-growing vegetative cover to protect it from wind and water erosion. The seed mix to be utilized for stockpile revegetation is presented in Table 3-4. If supplemental seeding is needed, it will be done the following year. If seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding. Side slopes will be monitored for erosion and will be repaired if erosion appears to be excessive.

Undisturbed islands located within the disturbed area will not be disturbed unless the mine reclamation plan is amended to allow for the disturbance. The islands will be signed as undisturbed to help protect them from any disturbance.

231.200. Soil inventories indicate that no topsoil substitutes will be needed.

231.300. Topsoil will be tested as per Section 243. If testing identifies a potential problem, additional samples may be collected to determine the extent and severity of the problem.

Vegetation monitoring will compare the results of plant growth on the replaced topsoil with the growth on the in-place soil materials. If there is a distinct difference between the two areas, the Operator will consult with the DOGM to determine the nature of the problem and will make corrections as recommended for improvement.

231.400. Construction of the topsoil storage site will begin by removing any large boulders and existing vegetation. Diversion ditches will be installed after the stockpiles are in place to channel drainage away from the stockpiles. Once the topsoil stockpile has been created with the material removed during construction of the proposed mine site, it will be reseeded and will remain in place until final reclamation occurs.

The surface of the stockpile will be left rough and irregular to increase retention of rainfall and snow melt. Seeding will be done following placement of the topsoil, and between Sept. 15 and Jan. 15, to take advantage of winter moisture. If seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding.

A silt fence or berm/ditch configuration will be installed at the perimeter of the pile to protect it from water erosion and vehicular traffic. Maintenance of the topsoil pile, during the life of the mining operation, will consist of: seeding the new stockpile, reseeding if erosion or other elements cause a loss of vegetation, and maintenance of the ditches and/or silt fence in the stockpile areas.

232. Topsoil and Subsoil Removal

232.100 Prior to topsoil removal, eight five gallon buckets of screened 1/4" cryptobiotic soil will be recovered and stored in a cool dry place for redistribution on the topsoil pile. Topsoil material will be removed from those areas of the mine yard where material will be excavated in order to achieve final yard configuration and which have been identified as suitable topsoil for reclamation based on the soil

survey. This includes the access road to and around the topsoil pile. This material will be used to construct a berm around the topsoil pile.

The following volumes represent soil resources that may be available for salvage, storage and subsequent redistribution during reclamation. The actual amount salvaged will be reported to DOGM following topsoil removal and stockpiling operations.

AVAILABLE SOIL RESOURCES

Map Unit	Potential Salvage Depth In.	Potential Acres	Potential Estimated Volume YD3	**Actual Salvage Depth In.**	**Actual Salvaged Acres**	**Actual Salvaged Top Soil YD3**
SBG	48	12.92	83377	**18**	**11.73**	**24475**
VBJ	30	9.62	38801	**18**	**8.81**	**12711**
XBS	12	10.39	16763	**12**	**8.08**	**18016**
DSH	40	1.56	8389	**18**	**1.49**	**3514**
RBL	8	5.53	5948	**8**	**3.86**	**7949**
RBT	6	0.09	73	**6**	**0.02**	**30**
TOTAL(2)		40.11	153350		**33.99**	**66695**
Bank to Loose Cubic Yards *1.18 (Amount topsoil pile is designed to hold.)						**78700**(1)

(1) An additional 800 yd^3 will come from the access road around the topsoil pile. This material will be placed in the berm around the topsoil pile.

The actual topsoil salvage will consist of removing a surface layer up to 18 inches thick over the disturbed area. If shale is encountered within 18 inches only the soil above the shale will be salvaged. (Plate 2-3). This would cover about 33.99 acres where soil would be salvaged and stored in the topsoil stockpile.

Total volumes of soil stored in the topsoil pile would be approximately 78,700 bank cubic yards. Removal of stones and boulders would be considered in volume estimates where they are part of the soil layer removed.

The stockpile has been sized to allow for bulking or swell of the soil as it is removed from the bank state to the loose state. A bulking number of 1.18 has been used. The area allowed for topsoil storage is 66,695 bank cubic yards x 1.18 which equals 78,700 loose cubic yards to be placed on the topsoil pile.

Boulders of approximately three feet in diameter and larger will be separated from the topsoil and piled or placed at appropriate locations such as adjacent to roads, pads etc. No attempt will be made to collect the large boulders into common piles. Boulders above ground level are in addition to topsoil volumes and may account for approximately 10,000 cubic yards.

~~UEI~~ECCR is not stockpiling large stones “boulders”. Boulders will be pushed to the side and left during construction and then upon reclamation the boulders will be pushed back into the approximate location form which they came. Rocks of 36" or less will be stored in the topsoil pile with the soil and will be redistributed with the soil.

The approximate 78,700 loose cubic yards of topsoil will be stored in a topsoil pile as shown on Plate 5-2. This topsoil pile will be approximately 350' long and 250' wide with 2:1 slopes. The height of topsoil pile needed is approximately 31 feet. The pile as designed has the capability of storing well over the required 78,700 cubic yards. See Figure 1 for topsoil pile calculations.

Soil from the proposed ventilation break out sites near the coal outcrop will not be salvaged. The slope above the north breakout fan is approximately 70%. Rock cover on the surface is approximately 60%. As a result of the very limited ground disturbance, and lack of access, soil cannot be reasonably salvaged. At these small isolated sites soil will not be salvaged or stored (See R645-301-232.700 and 232.710).

The sequence for topsoil removal in general, would be starting from the lower elevations of the site and working up slope. Surface disturbance may not be required on all of the acreage identified as the disturbed area. After removal of the topsoil to be salvaged, underlying soil materials will be used as fill or left in place.

All practical precautions will be taken during design, construction, and reclamation to assure that shales or shale material will not be pushed over the top of or mixed with subsoils. Contamination of the subsoil with shale will not be permitted. The certified soils specialist, or by a person who is determined qualified by the operator and the Division, on site during the construction and reclamations phases will carefully observe the construction and reclamation phases and prevent to the extent possible the mixture of shales and subsoils. Additional topsoil removal, in excess of 18" minimum, may be necessary to prevent the shale from contaminating the subsoil.

232.200. Since topsoil is sufficient this section does not apply.

232.300. The surface soil down to 18" or to the shale whichever is the least will be removed and stored.

232.400. This section is addressed in 232.700.

Lila Canyon Topsoil Calculations

Pile Height (in feet)	Pile Length (in feet)	Pile Width (in feet)	Area (in feet)	Volume LxW (in cubic yards)	Plus Slope Volume (in cubic yards)	One Foot Total Lift Volume (in cubic yards)	Total Cumulative Volume (in cubic yards)
0	350	250	87,500	0.00	0.00	0.00	0.00
1	346	246	85,116	3,152.44	44.15	3,196.59	3,196.59
2	342	242	82,764	3,065.33	43.56	3,108.89	6,305.48
3	338	238	80,444	2,979.41	42.96	3,022.37	9,327.85
4	334	234	78,156	2,894.67	42 .37	2,937.04	12,264.89
5	330	230	75,900	2,811.11	41.78	2,852.89	15,117.78
6	326	226	73,676	2,728.74	41.19	2,769.93	17,887.70
7	322	222	71,484	2,647.56	40.59	2,688.15	20,575.85
8	318	218	69,324	2,567.56	40.00	2,607.56	23,183.41
9	314	214	67,196	2,488.74	39.41	2,528.15	25,711.56
10	310	210	65,100	2,411.11	38.81	2,449.93	28,161.48
11	306	206	63,036	2,334.67	38.22	2,372.89	30,534.37
12	302	202	61,004	2,259.41	37.63	2,297.04	32,831.41
13	298	198	59,004	2,185.33	37.04	2,222.37	35,053 .78
14	294	194	57,036	2,112.44	36.44	2,148.89	37,202.67
15	290	190	55,100	2,040.74	35.85	2,076 .59	39,279.26
16	286	186	53,196	1,970.22	35.26	2,005.48	41,284.74
17	282	182	51,324	1,900.89	34.67	1,935.56	43,220.30
18	278	178	49,484	1,832.74	34.07	1,866.81	45,087.11
19	274	174	47,676	1,765.78	33.48	1,799.26	46,886.37
20	270	170	45,900	1,700.00	32.89	1,732.89	48,619.26
21	266	166	44,156	1,635.41	32.30	1,667.70	50,286.96
2	262	162	42,444	1,572.00	31.70	1,603.70	51,890.67
23	258	158	40,764	1,509.78	31.11	1,540.89	53,431.56
24	254	154	39,116	1,448.74	30.52	1,479.26	54,910.81
25	250	150	37,500	1,388.89	29.93	1,418.81	56,329.63
26	246	146	35,916	1,330.22	29.33	1,359.56	57,689.19
27	242	142	34,364	1,272.74	28.74	1,301 .48	58,990.67
28	238	138	32,844	1,216.44	28.15	1,244.59	60,235.26
29	234	134	31,356	1,161.33	27.56	1,188.89	61,424.15
30	230	130	29,900	1,107.41	26.96	1,134.37	62,558.52
31	226	126	28,476	1,054.67	26.37	1,081.04	63,639.56
32	222	122	27,084	1,003.11	25.78	1,028.89	64,668.44
33	218	118	25,724	952.74	25.19	977.93	65,646.37
34	214	114	24,396	903.56	24.59	928.15	66,574.52
35	210	110	23,100	855.56	24.00	879.56	67,454.07
36	206	106	21,836	808.74	23.41	832.15	68,286.22
37	202	102	20,604	763.11	22.81	785.93	69,072.15
38	198	98	19,404	718.67	22.22	740.89	69,813.04
39	194	94	18,236	675.41	21.63	697.04	70,510.07
40	190	90	17,100	633.33	21.04	654.37	71,164.44
41	186	86	15,996	592.44	20.44	612.89	71,777.33
42	182	82	14,924	552.74	19.85	575.59	72,349.93

Figure 1

232.410. This section is addressed in 232.700.

232.420. This section is addressed in 232.700.

232.500. Topsoil will be considered as the upper 18 inches of soil in most cases. Subsoil ranging in thickness from 12 to 30 inches from cutslope sites will be used as fill material for site development and replaced in an approximate original sequence during reclamation.

In order to verify subsoil depths, soil pedestals or other survey methods will be utilized for proper identification. Pedestals of undisturbed soil will be left at selected locations as reference points to show the type of soil thickness that has been removed from the slope cut areas. Records will be maintained to keep track of what materials are removed and where they are placed (topsoil storage or fill). Pedestals will vary in size depending on depth of cut. They will be designed to maintain stability of the soil column.

These soil pedestals may have to be removed once they have been properly logged to facilitate the mining operation.

An As-Built map will be prepared to show where soil materials have been used as fill material. This will include thickness records for topsoil, subsoil, and substrata. This information will be used to verify subsoil salvage depths according to Salvageable Soils Map Appendix A-2 of Appendix 2-3. This as built map is incorporated into the Mining Reclamation Plan as Plate 2-3a.

If shale is encountered in the slope cuts, the shale material will be separated from the other soil and returned to or near its original position upon reclamation.

Subsoils that are stored as pad material will be protected by a surface that is covered by asphalt, concrete, or gravel. The subsoil material will be under parking areas, buildings, roads, and storage sites. Graveled areas will have an impervious membrane placed between the subsoil and gravel. Precautions will be taken to avoid contamination. In the unlikely event visual observations indicate that subsoil has become contaminated from oil and grease, salts, or other visual contaminates, the contaminated soil will be disposed of at a sanitary landfill site (probably East Carbon).

232.600. Topsoil will be removed from excavation areas and stockpiled prior to construction activity. Vegetation and boulders that might interfere with topsoil salvage will be removed prior to removal and stockpiling of the topsoil.

The topsoil will be removed in two Phases. The first phase will remove topsoil, vegetation and boulders in an area large enough to allow for mining of diligence tons. The second phase which will remove the remainder of the approved topsoil and vegetation as per the MRP. The timing between phases is undetermined at this time and will be dictated by coal demand and market. The areas identified for disturbance left undisturbed after phase 1, will be treated as per the MRP.

232.700. It is anticipated that topsoil can be salvaged on areas to be disturbed. Approximate thickness of subsoil by Soil Map Unit are: SBG - 30 inches, DSH - 22 inches, and VBJ - 12 inches.

232.710. Soil removal from some local sites may be difficult due to rockiness and steep slopes. The area between the rock slopes and the ROM coal stockpile is an area of concern. In the area between the rock slopes and ROM coal stockpile the disturbance is minimal. The topsoil will not be removed from this area due to steep slopes. To protect this area from coal contamination the conveyor will be enclosed. Jersey Barriers will be installed to prevent the coal stockpile from encroaching this area. Topsoil will be removed in all areas of disturbance except for the area between the ROM coal pile and the rock slopes where either one or two bents will be constructed. Available underlying soils will be salvaged from stony disturbed areas. Areas too steep and rocky for equipment and where it would be unsafe or impractical for construction activities will not be included in the topsoil salvage plan.

Within the existing drainage channel and below culverts UC-5, UC-6 and UC-7, a woven geotextile liner shall be installed, prior to any fill material application, to protect in-situ soils from disturbance. Please see Chapter 5, Section 520; Appendix 5-9; and Plates 5-7E-1 through 5-7E-7 for further information.

232.720. No substitute soil materials will be needed.

233. Topsoil Substitutes and Supplements.

233.100. Soil inventories indicate that no substitute topsoil material will be necessary. Available soil material on the site is adequate for reclamation purposes.

233.200 Preliminary inventories show that no topsoil borrow area is needed.

233.300. This section is addressed in 233.400.

233.310. This section is addressed in 233.400.

233.320. This section is addressed in 233.400.

233.330. This section is addressed in 233.400.

233.340. This section is addressed in 233.400.

233.400 Soil Inventories show that no topsoil or topsoil substitute borrow area will be needed. Adequate amounts of suitable soil for plant growth are present based on root distribution and soil characteristics.

234. Topsoil Storage.

234.100. It will not be possible to redistribute the topsoil immediately. Therefore, the topsoil will be stockpiled for the purpose of final reclamation of the mine site. The rock storage areas are shown on Plate 5-2.

Access to the ventilation break outs will be from inside the mine. There will be minimal surface disturbance with the breakouts so no topsoil will be salvaged. Refer to the Surface Area map Plate 5-2 for the approximate location of the ventilation breakouts.

Presently there is not a subsoil stockpile required for this project, therefore, details are not provided.

234.200. Section 232.100 contains information on the topsoil stockpile.

234.210. The stockpile site selected is on the Strych soil. It is a well drained and stable site on cobbly alluvium.

234.220. The stockpile will be located and protected to avoid contamination. Unacceptable compaction will not be permitted. In areas where undisturbed soils are in close proximity to coal mining or reclamation activities, "Undisturbed Area" signs will be placed at or near the contact between disturbed and undisturbed. Quarterly inspections will be made to insure there is not an accumulation of coal dust or coal related debris. In the event coal dust is observed, water sprays according to air quality permit (DAQE-702-99) or alternative measures such as wind fence, or broadening of the topsoil salvage area will be employed to control the coal dust and fines.

234.230. The stockpile will be mulched and seeded with the seed mix presented in Table 3-4. Up to 1% by volume of the sifted soil crusts will be added to each load of Wood fiber mulch applied to the top soil pile. The slopes will have an irregular, pitted surface to help retain precipitation and minimize runoff. Silt fencing will be placed at the base of the stockpile. Topsoil stockpiles and other interim reclamation will be seeded when weather conditions are ideal, or prior to November 30th.

234.240. Plans are to leave the topsoil in place for the life of the mine.

240. Reclamation Plan.

241. Reclamation of the proposed disturbed area will begin once all surface facilities and structures have been demolished and removed. Disturbed areas will be restored to approximate original contour. Disturbed areas will be re-graded using pad material. Subsoil from Soil Map Units SBJ, DSH, and VBJ that are used as construction fill will be identified and used during reclamation as root zone subsoils. This information will be collected during the original grading operation and incorporated into the As-Built drawing referred to in Section 232.500. The grading sequence with regards to subsoil will be as follows:

a. Grade all areas where no subsoil is being stored.
b. Replace subsoil on areas from which it was removed.
c. Rip the subsoil to a minimum of 16 inches.
d. Replace topsoil.
e. Replace boulders
f. Gouge the topsoil.

After the disturbed areas have been recontoured and retopsoiled they can then be revegetated.

Sediment control during reclamation will be met by continued use of the sediment pond located below the yard area. All main culverts and an adequate amount of fill to maintain existing headwalls will be left intact during this reclamation phase.

After approximate original contour (AOC) is achieved, the surface will be prepared. The soil will be sampled in a maximum of five locations to be determined jointly by the Division and the Operator. The sampled soil will be analyzed for the parameters descried in tables 3 and 7 of the January 2008 “Guidelines for Management of Topsoil and Overburden”.

Where practical, the disturbed area will be scarified prior to soil redistribution. The rippers found on the rear of a cat will be used to scarify the disturbed area. The total surface where practical will be ripped on a maximum spacing of 6' to a depth of 16 inches. Pocking, after topsoil redistribution, will be the primary method used to roughen the surface. Pocking consists of imprinting the surface with a pattern of depressions as per Figure 1 in Appendix 5-8. The purpose of these pocks is to capture and retain water (moisture), and provide a cradle for seedlings and other plant materials. To enhance the ability of the soil to absorb moisture, best technology currently available at the time of reclamation will be applied to the soil surface.

In order to regenerate naturally existing soil organisms and assist in reactivating soil activity, an inoculum will be applied to the soil to reestablish soil bacteria, mycorrhizae and mycelium. To enhance soil microbial establishment and promote more rapid stabilization of the soil the seed mixture (as listed in Chapter 3) will be either hand broadcast over the area or sprayed using a hydromulcher. A wood fiber mulch will be hydro sprayed over the seed bed, then the surface will be sprayed with a tackifier. See Appendix 5-8.

242. Soil Redistribution.

242.100 Topsoil materials that were previously stockpiled will be redistributed on the same areas in a thickness which approximates the reclaimed thickness on the scarified, postmining regraded surface. For example if 8" of topsoil is removed from one area and 16' from another area reasonable efforts will be made to replace 8" where the 8" was removed from and 16" where the 16" was removed from. (See Plate 2-3 Soil Salvage and Replacement). The material will be hauled to the regraded area by dump truck or loader. The material will be placed using a front-end loader, crawler tractor, and/or trackhoe on steeper slopes and/or crawler tractor on the flat areas. After the backfill is placed to approximate original contour and the topsoil is respread, the site will be revegetated. Boulders will be replaced to achieve a near natural surface condition. The backfill will include subsoil material which was used as fill during the operational phase. Using as-built drawings, refer to 232.500, the subsoil will be replaced to its approximate original position prior to replacement of topsoil from the topsoil stockpile. Subsoil will be replaced in its approximate position in the reconstructed soil profile.

242.110. This section has been addressed in 242.100.

242.120. This section has been addressed in 242.100.

242.130. This section has been addressed in 241.

242.200. This section has been addressed in 242.100.

242.300. This section has been addressed in 242.100.

242.310. This section has been addressed in 242.100.

242.320. This section has been addressed in 242.100.

243. Soil Nutrients and Amendments. Nutrients and soil amendments will be applied to the redistributed material if deemed necessary by assessment of the laboratory analyses. Nutrients and amendments will be added, to make the redistributed soil similar to the undisturbed soils and aid in establishment of the vegetative cover. The nutrients will be added by hydro seeding.

The topsoil will be sampled and tested prior to replacement. Sampling will either be performed by a Certified Soil Scientist or by a person who is determined qualified by the operator and the Division. Grab samples will be collected from the stockpile after its height is reduced to 10 feet at the deepest end. Four or five grab samples should be sufficient to determine what the effects of darkness, compaction, and sterility have been on the fertility of the topsoil. The grab samples will be analyzed for nitrogen, phosphate and potassium. Fertilizer, if needed, will be applied to the topsoil prior to seeding and mulching activities.

244. Soil Stabilization.

244.100 Exposed surface areas will use vegetative stabilization where practical to control erosion and fugitive dust. Revegetative efforts (including regrading, topsoiling, fertilizing and mulching) will be conducted prior to the end of October.

244.200 After approximate original contour (AOC) is achieved, the surface will be prepared. Pocking will be the primary method used to roughen the surface. Pocking consists of imprinting the surface with a pattern of depressions as per Figure 1 in Appendix 5-8. The purpose of these pocks is to capture and retain water (moisture), and provide a cradle for seedlings and other plant materials.

In the event that soil crusts form on the topsoil stockpile, the Permittee will add up to 2 ounces of the sifted soil crusts to each load of Wood fiber mulch which will be applied to the reclaimed areas that have been regraded and covered by topsoil or substitute topsoil. (See Appendix 5-8).

Below culverts UC-5, UC-6 and UC-7, the in-situ topsoil, below the geotextile fabric and fill material, will require particular processes for soil stabilization. Please see Chapter 5, Section 520; Appendices 5-8 and 5-9; and Plate 5-7E-7 for more information.

244.300. Any rills and gullies of an excessive nature, which form on regraded and retopsoiled areas and disrupt the approved postmining land use or cause or contribute to a violation of water quality standards for receiving streams, will be filled, regraded or stabilized. The area will then be reseeded.

244.310. This section has been addressed in 244.300.

244.320. This section has been addressed in 244.300.

250. Performance Standards.

251. All topsoil, subsoil and topsoil substitutes or supplements will be removed, maintained and redistributed according to the plan given under sections 230 and 240.

252. All stockpiled topsoil, subsoil and topsoil substitutes or supplements will be located, maintained and redistributed according to plans given under sections 230 and 240.

WordPerfect Document Compare Summary

Original document: S:\Lila\2022\L22-001 - Add Lease Mods\Originals\Chapter 3.wpd
Revised document: S:\Lila\2022\L22-005 - LW Mining Add Lease Mods\Chapter 3 Edits - LW Mining Add Lease Mods.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 42 Deletions, 28 Insertions, 0 Moves.

Horse Canyon Extension
Lila Canyon Mine

Chapter 3
Biology

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300. BIOLOGY

310. Introduction.

311. Vegetative, fish, and wildlife resources of the permit area and adjacent areas are described in section 320.

312. Potential impacts to vegetative, fish and wildlife resources and methods proposed to minimize these impacts during coal mining and reclamation operations are described in sections 330 and 340.

313. Proposed reclamation designed to restore or enhance vegetative, fish and wildlife resources to a condition suitable for the designated post-mining land use are described under section 340.

320. Environmental Description.

321. Vegetation Information: The permit application contains the following vegetation information.

321.100. This section presents a discussion of the vegetation resources in the Lila Canyon Mine Extension Area and adjacent areas. The work was authorized initially by Kaiser Steel Corporation in 1982 and was referred to as the "South Least Tract." In 1985 Kaiser Coal incorporated a portion of the data from the South Lease and expanded it to include the Horse Canyon mine permit area. In 1990 this data was again updated and used to formulate the Mine Reclamation Plan for the Horse Canyon mine site and adjacent disturbance. This information can be found in the Horse Canyon MRP.

The Lila Canyon mine permit area encompasses a portion of the reclaimed Horse Canyon Mine and virtually all of the South Lease area (See Plate 1-1 Permit Area Map). Aerial photography was used to map the vegetation within the permit area.

A vegetation inventory was commissioned by UtahAmerican Energy, Inc. in 2003 to determine vegetation resources specific to the Lila Canyon Mine surface area. A copy of the report is included in Appendix 3-1.
Vegetation mapping for the areas encompassing the

federal lease modifications for lease #UTU-014218 and #UTU-0126947, as well as the potential future lease area south of the permit area, collectively known as Williams Draw, was performed in 2021 by Mt. Nebo Scientific, Inc. A copy of the report from that survey is included in Appendix 3-1a.

As requested by the Division, Canyon sweetvetch, Cliffs blazing star and creutzfeldt-flower will be surveyed for at least the year construction begins or one year prior to construction.

321.200. A determination of the productivity of the land within and around the permit extension area was implemented by Dean Stacy, Range Management Specialist for the NRCS Natural Resources Conservation Service, and is included in Appendix 3-2. Productivity of the vegetation in the grass-shrub resource area was 450#/acre. The pinyon juniper area to be disturbed the production was estimated to be 250 to 350 #/acre. The pinyon Juniper area, within the disturbed area, will be reclaimed to a grass shrub community.

322. Included in the permit extension application is fish and wildlife resource information for the extension area and adjacent areas.

322.100. The scope and detail of the fish and wildlife resource information presented in this chapter is sufficient to design the protection and enhancement plan.

322.200. Site specific resource information necessary to address the respective species or habitats is included.

322.210. The United States Fish and Wildlife Service publish yearly, in the federal Register, lists of endangered and threatened species. TABLE 3-1 cites federally listed threatened or endangered species which may occur in this area of Utah. Three species listed are potential inhabitants of the general area of Lila Canyon; the black-footed ferret, MSO, and bald eagle.

The 2000 model for Mexican Spotted Owl Habitat

was used to identify potential MSO habitat. The results can be found in Appendix 3-4.

The proposed addition to the permit area does not contain habitat for southwestern willow flycatchers. There are no perennial water sources or riparian areas in either the current permit area or the proposed addition, and according to verbal information from ~~UEI's~~ECCR's consultant, there are few, if any, willows or similar riparian-type vegetation associated with the seeps and springs in the proposed addition to the permit area. There may have been a few willows or shrubs, but there were no dense patches as would be required by southwestern willow flycatchers.

Lila Canyon Mine will have below-ground electrical power lines. These lines will be constructed to minimize potential hazards to all raptors new to the site, all will be designed and constructed in accordance with the guidelines set forth in Environmental Criteria for Electric Transmission Systems or as approved by DOGM.

322.220. The permit area for Lila Canyon Mine is located within the Price River Resource Area. Surface water in the adjacent areas drains into Grassy Trail Creek and Cottonwood Wash, both tributaries of the Price River. The environment around the 40.~~26~~11 acre mine site is within the Upper Sonovan life zone. The dominate Vegetation communities within the proposed disturbed area are pinyon-juniper and grass-shrub. Community types surrounding the proposed disturbed area are primarily pinyon-juniper, mixed conifer, spruce-fir, grass, and sagebrush-grass.

The Upper Sonovan life zone can provide habitat for approximately one hundred and forty-two species of wildlife. Two separate reports by the Utah Division of Wildlife Resources (DWR) identify species having potential to inhabit the region. The species that is considered to be of high interest in the local area is the Pronghorn.

Pronghorns are found as year-long residents within and adjacent to the permit area. These animals were transplanted to this site by the DWR in 1972 and are part of the Icelander Antelope Herd Unit II. Pronghorn prefer open sagebrush-desert and shrub-grassland habitats in areas of the Western United States. They are primarily browsers but are known to forage on grasses and forbs during spring and summer (FWS, 1978).

The pinyon-juniper woodlands, and interspersed sagebrush parks are winter range for mule deer. Many of the drier slopes are essentially juniper stands of scattered trees. The mule deer winter use is restricted to periods when snow is available or surface water is present during snow melt in the early spring, and the UDWR has rated this winter range as high priority.

- Elk winter range is located at higher elevations than that of the disturbed area and is not a factor in the disturbed site.

- Other wildlife in the pinyon-juniper woodlands are reptiles, passerine birds, lagomorphs, and small rodents.

- The talus slopes in the canyon are home to rodents and reptiles. They are also used by chukars. Snake dens are unknown in the talus slopes.

- The cliffs are generally north-facing and have potential as raptor nesting sites. Spring raptor inventories were initiated in the spring of 1998. The results of the annual raptor surveys are included in Appendix 3-5.

TABLE 3-1

FEDERALLY LISTED ENDANGERED AND THREATENED ANIMAL SPECIES

Mammals	
Black-footed ferret (1)	(Mustela nigripes)
Birds	
Bald eagle (2)	(Haliaeetus leucocephalus)
*Southwestern willow flycatcher (2)	
Mexican Spotted Owl (3)	(Strix occidentalis lucida)
Fish	

Colorado squawfish	(Ptychocheilus lucius)
Bonytail Chub	(Gila elegans)
Humpback Chub	(Gila cypha)
Razorback Sucker	(Xyrauchen texanus)

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(1) No confirmed sightings have occurred in Utah in recent years.

(2) Nests in Utah.

* No suitable nesting habitat within the permit area.

(3) Nests in Utah. (See Appendix 3-4 for Mexican Spotted Owl Habitat Survey Plan)

(A complete list of all potential T&E species found in Emery County is included in Appendix 3.3)

The intermittent / ephemeral stream channels lack riparian vegetation; thus many bird species of high federal interest would not utilize this area; example southwestern will flycatcher. The lack of trees or large shrubs precludes the use of woodpeckers. The stream channels do not support fish or an established invertebrate fauna.

The UDWR has submitted general information to be included in the wildlife plans of previous permit applications. Their information covers all the biogeological areas found on the Tavaputs Plateau which includes the Upper Sonoran, Transition, Canadian, and Hudsonian life zones. As noted previously only the Upper Sonoran life zone is represented within the permit area.

This UDWR general information is included in this application because it provides an overall description of the wildlife and wildlife habitats in the general area. The information is also useful in providing habitat information for design of the reclamation of the disturbed area. Thus the past wildlife habitat conditions can be emulated by reclamation and wildlife accommodated as they return to the mine site area upon final reclamation. (See Appendix 3-6, abbreviated)

The DWR has submitted information over the years in commenting on the various wildlife plans submitted in prior permit applications.

The ranking of wildlife values on coal-producing lands in Utah are found in Table 3-2 and are in the following list. The four rankings are in effect until June 30, 2006. The new rankings will have only two categories as shown.

Current

1 = Crucial-critical habitat
2 = High priority habitat
3 = Substantial value habitat
4 = Seasonal - Limited

After June 2006
1= Crucial
2= Substantial

Table 3-2 Ranking of Wildlife Habitat (Prior to 2004)

Species	Management Area
Rocky Mt. Big Horn (Seasonal)	5,411 Acres
Elk (Winter habitat)	19,840 Acres
Elk (Summer habitat)	1,280 Acres
Mule Deer (Critical)	9,280 Acres
Mule Deer (Year Long)	16,000 Acres
Pronghorn Antelope (Year Long)	12,160 Acres

It is important to note that the actual disturbed area (approximately 40.~~26~~11 total acres) is not critical elk or deer winter range, but is habitat for Rocky Mountain Big Horn Sheep.

According to DWR, Rocky Mountain Bighorn Sheep spend all year along the escarpments in the Lila Canyon area of the Book Cliffs. DWR and the Division visited the proposed disturbed area on June 11, 2002. Prior to the visit, the DWR representative was concerned that sheep may need to move further up the cliff when traveling the escarpments because of the mine and that sheep would likely leave the area. After the visit, the DWR representative felt that the sheep use of Lila Canyon may not be affected. The change in opinion may be due to the fact that the DWR representative was not familiar with the specifics of the mine plan until the site visit.

Rocky Mountain Big Horn Sheep appear to have a low tolerance for disturbance. Considering the low population density and the abundance of suitable similar habitat this impact appears to be slight.

The loss of range for Big Horn Sheep is

mitigated and is defined in the Environmental Assessment submitted in association with the Right-Of-Way applications.

The USFWS recognizes that the permit area is within range of endangered species, including the black-footed ferret, MSO, and the bald eagle (Letter dated February 4, 1998, Appendix 3-3).

Raptor surveys were initiated in 1998 and continue annually with the exception of 2004. These surveys were initiated before ground-breaking of the Lila project. The results of these surveys are in Appendix 3-5. The entire Book Cliffs escarpment within the permit area was inventoried for cliff nesting raptors. In addition, a 1-mile buffer zone was inventoried around areas of potential development.

An active golden eagle nest, with young, was documented during the 1999 spring raptor survey. In 2005 nest 946 contained a chick that was possibly dead. USFWS, Laura Roma, UDWR, Chris Colt, and BLM, Dave Mills determined, during the EA process, that there was a high probability these nest sites would be abandoned. A cooperative agreement with the regulatory agencies and UEI was finalized and is made part of the mitigation for the Lila Canyon EA. One nest discussed above, also lies in an area of potential subsidence which is a mute point due to its close proximity to the mine site. Since the nests are located so close to the mine surface facility and that there was a high probability these nest sites would be abandoned, these nests will be mitigated by a prey base off-site vegetation treatment project approved by the USFWS, UDWR and BLM (See page 19 for BLM mitigation information).

Although it was predicted that these nests might be abandoned, the Operator will coordinate closely with USFWS, DWR, and the Division to avoid “take” of golden eagles prior to

construction and during operations. Immediately following any raptor survey that shows that the eagles are tending nests or nesting, the operator will contact the USFWS and DOGM. The agencies will immediately coordinate to determine appropriate measures.

Although the Operator will avoid "take", the operator agreed to the BLM-lead mitigation project that is based on the premise that there is sufficient nest sites in the area to accommodate the population base. The limiting factors appears to be available prey base. Mitigation is designed to enhance the prey base while concurrently enhancing habitat for big game, deer, elk, and bighorn sheep.

It is estimated that mining operations will use an average of approximately 81 acre feet of water annually. The USFWS considers that this volume of water will adversely affect the four endangered Colorado River fish. ~~UEI~~ECCR will report actual water depletion values annually in their annual report.

The USFWS recovery program is reasonable and prudent alterative to avoid the likelihood of jeopardy to these fish.

322.230. All known species or habitats needing special protection have been addressed.

322.300. Copies of the MRP have been submitted to the Division to allow for distribution to USFWS.

323. Maps or aerial photographs of the permit area and adjacent areas have been provided. Plates 3-1~~ and~~A through 3-1~~A~~D are maps that show all critical habitat, raptor nests and all special habitat features. These plates will be updated on an as needed bases to reflect current conditions such as new raptor nests and/or changes in wildlife use.

323.100. The location of the proposed reference area is shown

on Figure 1 of Appendix 3-1. Appendix 3-1 is the report for the 2003 vegetation inventory. The reference area for the mine site disturbance was established during the summer of 2003. The reference area was chosen in an area which represents the natural premining conditions of the permit area. The reference area will facilitate the determination of successful revegetation and the resultant final bond release for the Applicant.

323.200. Monitoring locations are shown on Plate 3-1 and can also be found on the raptor inventory map in Appendix 3-5.

323.300. Protection facilities: There will be no facilities used exclusively for the protection or enhancement of fish and wildlife.

323.400. Plate 3-2 Identifies each vegetative type and plant community. The sample locations used during the vegetation inventory can be found on Figure 1 of Appendix 3-1. Wildlife use areas can be correlated to vegetation with the incorporation of the Wildlife Map, Plate 3-1.

Appendix 7-8 provides a description of each water monitoring location. In Summary monitoring locations L-6-G, L-7-G, and L-11-G have a habitat overstory of Douglas Fir-Mountain Brush association. Water monitoring location L-8-G has a habitat of predominantly pinyon - juniper and sagebrush grass associations. Water monitoring locations L-9-G, L-10-G, and L-12-G have some minor wet meadow habitat with an overstory of pinyon-juniper and sagebrush grass immediately adjacent along each side of the sites. Water monitoring sites L-16-G and L-17-G are both seeps and have a habitat of a mix of grasses and salt desert shrub with some invasive tamarisk.

Sites L-1-S, L-2-S, L-3-S, L-13-S, L-14-S and L-15-S are dry washes with a habitat consisting of sagebrush with an overstory of pinion-juniper.

Monitoring site L-4-S and L-5-G are for sediment pond discharge and for the mine discharge and have a habitat consisting of an overstory of pinion-juniper.

330. Operation Plan. A plan for protection of vegetation, fish and wildlife resources follows:

331. The Lila permit area is approximately ~~5544~~5,343.~~01~~19 acres, of which only approximately 40.~~26~~11 acres are within the surface disturbance area. All incidental disturbance, which will not be utilized in operations, will be revegetated with an interim seed mix proven beneficial to wildlife. The revegetation plan is addressed in Section 341 and the seed mixes are addressed in Tables 3-4 and 3-5. Revegetation will occur the first desirable period following disturbance and/or abandonment.

332. The extent and degree of subsidence will be in large dependent on both the amount of overburden as well as the mining method. Employees and or consultants of the operator have numerous years of experience mining the Bookcliffs and Wasatch areas and none have observed nor are aware of any negative impacts on wildlife or vegetation, as a result of subsidence, with the exception of

1) Escarpment Failure which is not anticipated.

2) Disruption of Surface and / or Ground Water, which is not anticipated.

(1) Escarpments will be protected by implementing escarpment barriers. An escarpment barrier of a minimum of 200', within which no second mining will take place, will be used to protect escarpments immediately above the coal seam and protect against unplanned holeouts.

(2) Disturbance of Surface and / or Ground Water. Considering~~,~~ the permit area has no surface water with the exception of intermittent or ephemeral flow associated with precipitation events and / or snow melt, subsidence should have no adverse effect. The ephemeral stream channels, in the area's of potential subsidence, will be monitored to insure there are no adverse impacts to the ephemeral flow.

No negative impacts to vegetation are anticipated. However,

vegetation will be monitored in conjunction with subsidence monitoring, utilizing infrared aerial photography once every five years for those areas that are undermined. This will be done in accordance with the subsidence control plan. (See Section 525). Any loss of or diminished appearance of vegetation will be noted, confirmed on the ground, and a corrective plan to mitigate the loss will be submitted to the Division of Oil, Gas, and Mining for their approval and concurrence prior to implementation.

It is anticipated that the saturated zone will most certainly produce some water when intercepted in the course of mining. The effect could be positive in the event the mine were to discharge surplus water to the surface. Assuming the water quality was suitable for wildlife, a valuable enhancement fixture could be sustained at a minimum through the life of the mine. While it is possible subsurface disruption of ground water could occur as a result of subsidence it is problematically slight. (See Appendix 7-3 Probable Hydrologic Consequences (PHC).)

The losses of wildlife habitat and or vegetation through subsidence is not anticipated. The mined portion of the permit area will be monitored visually each spring for evidence of subsidence. In the event vegetation and or wildlife habitat where impacted; mitigation could take the form of: 1) habitat enhancement - through selected manipulation of existing undisturbed areas to increase productivity of preferred forage species, and 2) off site water sources such as construction of guzzlers and stock water impoundments.

Each of the above would need to be analyzed on a site specific bases, taking all agencies (UDWR, UDOGM, and BLM) input into a viable, workable, course of action to be implemented by the mine and as stipulated in the Lila Canyon EA.

Table 3-3
Time Table of Reclamation

April 16, 2028	Begin Demolition
November 15, 2028	Complete Demolition
April 16, 2029	Commence Earthwork
August 30, 2029	Completion of Phase 1 (Earthwork) Lower Area
September 1, 2029	Begin Earthwork Road / Portal Upper Area
October 1, 2029	Seeding and Mulching (Weather dependent) Completion of Earthwork Upper Area
November 1, 2029	Fencing
November 15, 2029	Reclamation Completed
July 2033	Ocular Estimates of Success (Remedial seeding if necessary September 2034)
October 2031	Planting Seedlings (If Needed)
July 2035	Quantitative Vegetation Inventory
August 2037	Quantitative Vegetation Inventory Site and Reference Area
August 2042	Quantitative Vegetation Inventory of Referenced Area and Project Site, Bond Release Criteria

The tentative life of a mine is twenty years depending on market and mining conditions. As such, the time table is generic and no set year will be specified for the cessation and abandonment of operations.

333. Major Impact: The major impact to the wildlife in and around Lila Mine site will be loss of habitat. The loss of habitat will occur during the construction of the site, and will be residual throughout the life of the mine. The operational activities at the site will impact the wildlife slightly. But as observed at operations located in both the Book Cliffs and Wasatch plateau, most of the wildlife in the area will either accept or adjust their behavior to coexist with the operation.

The examples below are just some of the observations that the operator has experienced that demonstrates most wildlife accepts or adjusts to coexist with mining operations:

At U.S. Fuel Company, deer were observed crawling under railcars. Deer were observed fawning just inside old portals for three consecutive years.

At Genwal, deer have been observed on a consistent basis crossing a perennial stream to drink from the sediment pond. Bear and elk have been observed on numerous occasions from the bathhouse, office, and parking lot grazing only a few hundred feet away.

At Beaver Creek, deer have been observed drinking from the sediment pond on an almost daily basis. Bear, lion and elk were observed from the bathhouse offices. Deer were observed crawling under low conveyors instead of using a 10' elk crossing only 20' away.

At Kaiser, Rocky Mountain Bighorn Sheep were observed from the mine office on a regular basis.

At Horse Canyon, Bighorn Sheep have been observed in and around the #1 and #2 sediment ponds. The Bighorns have been photographed grazing directly across the road from the inactive mine facilities.

Dust abatement and dust control as outlined in Chapter 5, such as covered conveyors, water sprays, and the minimization of large stockpiles will adequately protect adjacent undisturbed area within and surrounding the surface facilities.

It was determined that all nests within a ½ mile radius of the surface facilities have a high probability of being abandoned by indirect

disturbance associated with mine activities. The Lila Canyon EA # UT-070-99-22, outlines mitigation recommended through a cooperative effort between Utah Department of Wildlife Resources, Bureau of Land Management, U.S. Fish and Wildlife and UtahAmerican Energy, Inc. where mitigation would be implemented to increase prey base off-site. The construction of alternative nests was considered to be ineffective. Eagle distribution was not limited by suitable nest sites but by available prey.

An MSO two-year calling survey will be completed according to Appendix 3-4. Results as described in Appendix 3-4 will be reported to the Division, UDWR, and USFWS. This two-year survey will include four night time surveys with no more than one survey prior to end of April and at least three surveys prior to end of July. Results will be submitted to USFWS, DWR, and the Division immediately following of each night time survey. If owls are observed, the agencies will immediately coordinate to determine appropriate measures.

Construction at the mine to upgrade drainage controls and to construct the road will have a minor impact on wildlife in the area. The impact will mainly be increased human activity associated with the construction and a small, less than 42.6 acre, loss of habitat for the mine site, roads and sedimentation pond. These impacts will have little or no affect on the wildlife because they will be completed in an environmentally sound manner.

~~UEI~~ECCR will instruct all personnel as to current regulations regarding the use of off-road vehicles, firearm regulations, and where current UDWR proclamations are available. This training will be part of the annual refresher offered to all employees. The company will encourage strict compliance with these regulations.

DWR will be notified of any road kills involving large game and request to have them removed to safeguard raptors. Mine personnel will be instructed to remove road kills a safe distance from the road way.

The Lila Canyon Mine has agreed to mitigate the loss of wildlife habitat as well as the potential loss of habitat use due to disturbance.

This mitigation is under advisement of the wildlife professionals of both the BLM and the Utah Division of Wildlife Resources. The mitigation designed will offset impacts to bighorn sheep, mule deer, elk, and chukker specifically. The mitigation committed to in association with the Lila Mine EA is :

(1) Install two guzzlers
(2) Participate in a BLM habitat enhancement program on 76.14 acres-conversion from Pinyon/Juniper to shrubs, forbs, and grasses.

NOTE: The 76.14 acres is less than the EA 2000 EA acres of 93.11. This difference is a result of the EA evaluating more acreage than what will actually be disturbed. The 2000 EA considered what it calls the Lila Canyon Road which will not be constructed, thus not disturbed. The Lila Canyon Road, not being constructed, refereed to in the EA, contains 16.97 acres. The actual acres for habitat enhancement will be 93.11 -13.23 - 3.74 = 76.14 acres of enhancement.

The overseeing agency for the EA mitigation/enhancement will be the BLM. The implementation dates, and project locations will not be determined until the BLM notice to proceed is given, after permit approval. The Permittee will submit the BLM mitigation plan as an Appendix to this volume within one year of the initial mine construction. The BLM plan will include: project goal, expected benefits, project procedures, company commitment, implementation dates, project location and agencies contacts.

333.100. This section is addressed in 333. And 333.300.

333.200. This section is addressed in 333. And 333.300.

333.300 The goal of the mine is to construct all facilities and conduct mining in such a manner to minimize adverse impacts to wildlife. These measures will include but are not limited to:

1. Interim revegatation with desirable plant species for wildlife, with the exception of transportation corridors.

2. Speed limits on all roads to lesson potential for possible animal/vehicular collisions.

3. Wildlife awareness training to be incorporated into the annual safety training for all employees.

4. Possible restrictions on firearms on the mine site, and restrictions on off road vehicle usage to lesson disturbance.

5. The Operator will ensure that DWR surveys for cliff nesting raptors within proposed facilities areas at least two years prior and one year following construction. The Operator will conduct annual raptor surveys.

   As part of normal mining operation requirements, the Permittee must submit all results of the raptor surveys to the Division in Annual Reports and must immediately contact the Division, BLM, and USFWS following any raptor survey that shows that eagles are tending nests or nesting. The agencies will immediately coordinate to determine if the Permittee must implement appropriate measures. If the agencies recommend mitigation, the Permittee must submit all plans to the Division for incorporation into Appendix 3 of the MRP.

6. An active golden eagle nest, with young, was documented during the 1999 spring raptor survey. The nest is located in the left fork of Lila Canyon within the 1-mile buffer zone. (See Plate 3-1). A consultation with USF&W, BLM, and UDWR was held in the fall of 1999. Line of site and potential mitigation was addressed during this meeting. The results of this consultation are addressed in Sec 322.220 and the Lila Canyon EA. This nest was not active in 2000, 2001, 2002, or 2003. A survey was not done in 2004. In 2005 nest 946 contained a possibly dead chick. (See Appendix 3-5 for updated inventories)

7. The Operator will adhere to exclusionary periods when initiating construction and final reclamation projects. The exclusionary periods include: raptors (Feb 1 - July 15), Bighorn sheep lambing (May 1 - June 15), and Pronghorn (May15 - June 20).

   In the event of unforeseen changes in construction or mine plans, or in the case of emergency situations that may force the Permittee to conduct activity near or within the

0.5 mile buffer zone of raptor nest and during raptor exclusionary periods (February 1 to July 15 for golden eagles), the Permittee will immediately contact the Division, BLM, DWR, and USFWS. The agencies will immediately coordinate to determine appropriate measures that may include conducting ground surveys, in coordination with DWR, to determine if birds are tending nests or nesting and possibly determine the life stage of the offspring; developing a mitigation plan, in coordination with the agencies, for possible impacts to nests or birds; or ceasing operations until the end of breeding season to avoid 'take'. If the agencies recommend surveys, the Permittee must submit all survey results to the Division in Annual Reports. If the agencies recommend mitigation, the Permittee must submit all mitigation plans to the Division for incorporation into Appendix 3 of the MRP.

The Applicant does not plan to monitor any wildlife species during the life of the operation with the exception of raptors. Spring raptor surveys will be conducted at a minimum of a 1-mile radius around any new or potentially disruptive mining activity, 2-years prior and annually after the proposed activity. The Operator will contact the USFWS and the Division immediately following raptor surveys if raptors are observed tending nests or nesting.

The mine will emphasize their commitment to legal requirements of firearm and off-road vehicle-use by employees. This type of program has been adopted by the operator and will continue throughout the operation. An education program aimed at minimizing potential negative impacts by employees will be presented during the Operators annual retaining programs. Employees will be informed about the wildlife in the area and about which species are protected. They will be counseled to refrain from poaching or harassing animals and about the need to preserve the wildlife. They will also be instructed on the danger of animals on the road during dusk and night hours and consequently the need to reduce speed to avoid colliding with animals difficult to see in these periods of poor light. All threatened or

endangered wildlife sighted within or adjacent to the permit area will be reported to the appropriate state and / or federal agency.

The location and construction of the haulage road, as well as measures for the protection of surface hydrology, from sedimentation, including the sedimentation pond and other drainage control structures, are discussed in Chapter 7, Hydrology.

Any waters discharged from the facility will be monitored in accordance with UPDES Permit No.UTG040024. Major disturbances will be scheduled to avoid deer / antelope fawning times.

No use of pesticides or chemicals that have serious consequences to plants or wildlife will be used on the permit area, unless recommended by a regulatory agency and under their direction.

Prevention of fires and their spreading outside the permit area will be accomplished through; water sprays, and fire extinguishers located at all facilities . Wild fires will be addressed by the appropriate state and federal agencies. Operation and reclamation activities will be done in compliance with the Endangered Species Act of 1973. As instructed by the Bureau of land Management and the Utah Division of Wildlife Resources, fencing will be removed when DOGM determines that all reclamation standards have been met. Further measures taken to enhance wildlife habitat during reclamation are discussed under the “Reclamation Plans” section of this chapter.

The interim reseeding of small areas will provide some small amounts of additional forage and

seed. Reseeding will particularly benefit rodents and passerine birds seeking seeds in this sparse vegetative

type. The seeding of sediment pond slopes usually provides a bonus crop of seeds as the plants are watered by intermittent runoff.

Within the disturbed area, there are areas of undisturbed ground such as in topsoil storage areas. These areas will be posted so as to preclude trespass by vehicles and/or mine equipment. In addition, dust control will be practiced throughout the life of the mine to minimize impacts from blowing dust .

The sediment ponds on the disturbed area will hold water during short periods and will provide some additional surface water for wildlife. The stored water may prolong use of that portion of the winter range by deer because water is often the limiting factor on dry winter ranges. Migrating small birds and mourning doves will also utilize this water to recuperate during their flights, as well as a small indigenous flock of chukkers. In the event the water in the pond were to contain any material which would be hazardous to wildlife (ex: oil, grease), the material would be removed by the use of petroleum selected filtration material. The filtration material will be used when an apparent sheen is visible on the pond. If hazardous materials are observed the Division will be notified immediately to develop a protection plan for wildlife. The pond will be monitored visually daily by surface personnel for signs of oil and grease.

340. Reclamation Plan.

A reclamation plan for final revegetation is presented below.

341.100. TABLE 3-3 is a timetable of reclamation activities upon cessation of operation. The tentative life of a mine is twenty years depending on market and mining conditions. As such, the time table is generic and no set year will be specified for the cessation and abandonment of operations.

341.200. This section is addressed in 341.210.

341.210. TABLE 3-4 indicates the species and amounts per acre of seeds to be used in revegetation.

The seed mixture used to revegetate the disturbed areas at Lila Canyon Mine is given on TABLE 3-4, along with the rates of application. The seed mixture was developed for the disturbed area with respect to a number of considerations. Climatic conditions of area and the availability of water were reviewed to assess the need for drought-tolerant species. The vegetation information was evaluated to determine the seed mixture needs corresponding to productivity, cover and diversity requirements. Data was gleaned from the soils report to select species adapted to the physical and chemical characteristics of the potential seedbed.

341.220. The disturbed area will be reclaimed after all operations have ceased at the mine site and all pertinent structures have been removed. The coal will be loaded out and the surface will be left relatively free of debris. The area will be recontoured to approximate pre-mine configurations. The soil will then ripped to a depth of 16 -18 inches.

The previously salvaged top soil will then be redistributed over the total disturbed area. Soil depth and soil cover are addressed in Chapter 2.

The seedbed will be prepared by completing the final grading and again either gouged or ripped to a depth of 6-18 inches or to bedrock. Ripping the soil will be completed at a speed that maximizes the action of the ripper shanks and promotes spoil material disruption to the required depth.

During the final ripping or gouging process, seedbed material will be collected and sent to a laboratory for analysis to determine fertilizer requirements. The fertilizer recommendations will

be added to the soil at the specified rate of application. Seed and fertilizer will be distributed utilizing a hydroseeder . Fertilizer and seed will not be mixed during hydroseeding operations.

Hydroseeding operations will not be conducted when wind velocities would interfere with the even distribution of the material. All efforts will be made to attain an even distribution of seed. (See Appendix 5.8)

Once Hydroseeding is complete, the area will be hydromulched, see Appendix 5-8 and Section 341.230.

The area will be seeded and fertilized (if needed) with the recommended species (see TABLE 3-4), and nutrients at the specified rate of application. At present a general recommendation indicates that 100 pounds per acre of 16-16-8 will need to be added as a nutrient.

All efforts will be made to insure the quality of materials purchased for reclamation activities are maintained throughout all work. Commercially purchased seed will have the seed names, lot number, percentages of purity, germination, hard seed and percentage of maximum weed seed count clearly marked on each container. No seed will be accepted if they contain seeds of a state-recognized noxious weed species. Sources for “common” seed should be those with climatic and elevational characteristics as close to site characteristics as possible. Legume seed will be inoculated with the correct Rhizobium.

341.230. The site will be hydro-seeded with seed and an initial 500#/acre of mulch and 100#/acre of tac agent. Followed shortly by an additional 1500 to 2000#/acre of mulch. Finally, an additional 100#acre of tac and fertilizer, choice and application rate to be determined by the testing in section 243, will be applied. Fertilizer and

seeds will not be mixed together during the hydro-mulching operations.

341.240. There will be no irrigation or supplementary water used during or after the revegetation of the area. There are no planned pest or disease control measures for the mine site reclamation. Pest or disease control measures may be included in this plan if results from the test plot and / or reference area indicate a need. The measures will be consistent with proper rangeland and wildlife management.

341.250. A reference area for the mine site disturbance was established adjacent to the proposed facilities during the summer of 2003 (Figure 1, Appendix 3-1). The reference area was chosen in an area which represents the natural premining conditions of the permit area. This reference area will facilitate the determination of successful revegetation and the resultant final bond release for the Applicant.

Comparisons of the revegetated area and the reference area will be made using the data obtained from the ninth and tenth year sampling. This data will be used to obtain statistical information that will show the site meets the requirements for bond release.

341.300. The methods outlined have a proven performance based on the successful reclamation of the Horse Canyon Mine in the immediate drainage to the north (less than two miles) in like habitat and aspect.

The Operator will conduct a study to determine the optimum time for seeding warm seasons species (refer to page 29).

Table 3.4/3.5
INTERIM AND FINAL RECLAMATION SEED MIX
Recommended Seed Mix for Lila Canyon Mine

Species	Latin Name	Seeds/lb	# Seeds per Acre Planted	%Mix Planted	Seeding Rate Lbs / acre	Seeds / ft^2
Grasses						
Needle And Thread	Stipa Comata	115,000	230,432	5	2.00	5.3
Indian Ricegrass	Achnatherum humenoides	141,000	282,269	6	2.00	6.5
Basin Wild Rye	Leymus cinereus	130,000	129,373	3	1.00	3.0
Galleta	Hilaria jamesii	314,500	313,632	6	1.00	7.2
Bluebunch Wheatgrass	Pseudoroegneria spicata	140,000	139,392	3	1.00	3.2
Slender Wheatgrass	Elymus trachycaulus	159,000	317,988	6	2.00	7.3
Blue Gamma	Bouteloua gracilis	825,000	827,640	17	1.00	19.0
Subtotal						51.4
Forbs						
Blue Flax	Linum lewisii	293,000	294,030	6	1.00	6.8
Palmer Penstemon	Penstemon palmeri	610,000	152,460	3	0.25	3.5
Globemallow	Sphaeralcea ambigua	500,000	250,470	5	0.50	5.8
Indian Paintbrush	Castilleja linariaefolia	4,915,000	479,160	10	0.10	11.0
Fringed Sage	Artemisia frigida	4,536,000	435,600	9	0.10	10.0
Subtotal						37.0
Shrubs						
Wyoming Big Sage	Artemisia tridentata	2,576,000	653,400	13	0.25	15.0
Green Rabbitbrush	Chrysothamnus nauseosus	400,000	41,382	1	0.10	1.0
Fourwing Saltbush	Atriplex canenscens	52,000	43,560	1	0.84	1.0
Winterfat	Ceratoides lanata	56,700	56,628	1	1.00	1.3
Shadscale	Antriplex confertifolia	64,900	64,904	1	1.00	1.5
Cliffrose	Cowania mexicana	64,600	64,469	1	1.00	1.5
Black Sage	Artemisia nova	907,200	230,868	5	0.25	5.3
Subtotal						26.5
TOTAL PER ACRE		**16,799,900**	**5,007,658**	**100**	**16.39**	**115**

342. Fish and Wildlife. A fish and wildlife plan follows:

342.100. The sediment ponds will be maintained through the life of the operation and will be removed when effluent criteria is met following reclamation.

342.200. Rangeland for domestic stock is the secondary intended postmining land use with wildlife habitat as the primary land use. Plant species appropriate for enhancing the wildlife habitat were selected on the basis of known wildlife requirements including nutritional value for fish and wildlife, use as cover for fish and wildlife and ability to support and enhance fish and wildlife habitat. The Pinyon/Juniper area will be enhanced and reclaimed to the Grass/Shrub community type. The habitat type provides excellent winter range for big game, as well as, an increase in rodent populations which in turn are beneficial to raptors. The Lila Canyon EA has stipulated that in excess of 70 acres of wildlife habitat will be enhanced to help offset negative impacts.

342.210. This section is addressed in 342.200.

342.220. This section is addressed in 342.200.

342.230. This section is addressed in 342.200.

342.300. This section is not applicable.

342.400. This section is not applicable.

350. Performance Standards

351. All coal mining and reclamation operations will be carried out according to plans provided under R645-301-330 through R645-301-340.

352. Lila Canyon Mine will implement contemporaneous reclamation on all areas that are disturbed through construction or in the course of mining that will not be utilized for future activity that constitutes continued disturbance.

353. General Requirements. The Permittee will establish on regraded areas and on all other disturbed areas a vegetative cover that is in accordance with the approved permit and reclamation plan. The first available season following abandonment / completion the area will be seeded and mulch in accordance with the approved reclamation plan.

353.100 The contemporaneous seed mix TABLE 3-5 is capable of self-regeneration.

The seed mix in Table 3-5 is designed to be compatible with native plant species and beneficial to the animals indigenous to the area for both forage and cover.

All seed used in contemporaneous revegetation will be certified and in compliance with all state and federal laws governing seeding.

353.130. The vegetative cover will be at least equal in extent of cover to the natural vegetation of the area; and

353.140. Capable of stabilizing the soil surface from erosion.

353.200. The reestablished plant species will:

353.210. Be compatible with the approved postmining land use:

353.220. Have the same seasonal characteristics of growth as the original vegetation:

353.230. Be capable of self-regeneration and plant succession:

353.240. Be compatible with the plant and animal species of the area; and:

353.250. Meet the requirements of applicable Utah and federal seed, poisonous and noxious plant; and introduced species laws or regulations.

353.300. The Division may grant exception to the requirements of 353.220 and 353.230 when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

353.400. There are no prime farm lands within the permit area or anticipated crop lands.

354. Timing: Seeding will occur between September 30 and may proceed up until March 30 depending on snow and frost condition

DOGM has expressed a concern over the fall planting of the warm season species, Blue grama and Galleta. Both of these species are in evidence at the Horse Canyon Site, which was reclaimed in the fall of 1991. However, ~~UEI~~ECCR is committed to use these species in the interim seed mix, adjacent to the sediment pond. Area 1, the Southeast corner, and Area 4 the Northwest corner of the pond disturbance, will be seeded mid summer (July) following the construction. Area 2, the Southwest quarter and Area 3 the Northeast quarter of the disturbance, will be seeded late fall (October) following construction. The line separating the four areas will be staked on the ground. Ocular estimates of the success of the reclamation will be implemented each fall for 3 years following the reclamation. In year 4, if there appears to be an apparent difference in success, a quantitative sample will be taken. The sample will identify both species composition as well as overall vegetative cover for both areas.

If in the event a conclusion as to the timing of planting results in a significant degree of success, the reclamation plan can be modified during the 5 year renewal process.

355. Mulch will be applied on the same bases as indicated for permanent reclamation.

356. Standards for Success:

356.100 Success of revegetation will be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the extent of cover of the reference area.

356.110. Standards for success, statistically valid sampling techniques for measuring success, and approved methods are identified in the Division's "Vegetation Information Guidelines, will be followed closely. (See “Lila Canyon Vegetation Inventory” found in Appendix 3-1)

356.120. Standards for success recommended in the “Vegetation Information Guidelines” will be followed closely. *(*See “Lila Canyon Vegetation Inventory” found in Appendix 3-1)

356.200. Standards for success will be applied in accordance with the approved postmining land use of wildlife and incidental use by domestic stock.

356.210. This Section does not apply since the area is post mining wildlife habitat, with incidental use by domestic stock.

356.220. This Section does not apply since there are no agriculture lands within the permit area and no prime farm lands. See Chapter 2, Appendix 2-1 (Prime Farmland Letter).

356.230. Success of vegetation will be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows:

The requirements for cover, productivity and woody plant density are, at least 90% of the cover, woody plant density and productivity of the reference area with 90% statistical adequacy. The site will be sampled in a manner similar to the

method used to sample the reference area.

Diversity will be determined with the following method:

1) All species encountered with at least a 20% frequency in the vegetation sampling will be categorized into life forms. The life form categories that will be used are native grass, native broadleaf forbs, native shrub, desirable introduced, and undesirable. Undesirable species are those generally classified as weeds or that are poisonous to livestock. If there is any question whether a species should be considered undesirable, the Division and ~~UtahAmerican~~Emery County Coal Resources, Inc. will consult with the Emery County Weed Department.

2) The standard will be that the reclaimed area must have at least as many native grass, native broadleaf forbs, and native shrub species occurring at 20% or greater frequency as the reference area. For example, if the reference area has 3 native shrub species occurring at 20% or greater frequency, the reclaimed area must also have this many species. The species do not need to be the same.

Essentially the same method would be used to judge seasonality, but the only categories would be warm and cool season.

Erosion control relative to both vegetation density and species composition would be based on effluent standards as committed in the UDPES permit. All drainages leading away from the permit area will be sampled as often as practical. When effluent standards are met, the vegetation will have demonstrated its erosion control effectiveness. Woody plant density for

the entire area will be established with 1,500 plants per acre, unless the Divisions consultation with area agencies determines a different density.

356.231. (See Section 256.230)

356.232. Tree stocking / woody plant density will meet or exceed UDOGM guidelines for bond release.

356.233. Success standards for vegetative ground cover: (See Section 256.230)

356.240. This Section does not apply since no portion of the permit area will be used for industrial, commercial or residential use.

356.250. No pre-law mining occurred on the Lila Canyon Permit area.

356.300. Lila Canyon Mine is committed to maintain siltation structures until vegetative cover is adequate to allow runoff to meet affluent limits as directed by UDOGM at a minimum two years following vegetation establishment.

356.400. Lila Canyon Mine will have all disturbance associated with removal of siltation structures seeded and mulch in accordance with the approved revegetation plan.

357. Revegetation: Extended Responsibility Period.

357.100. The period of extended responsibility for successful vegetation will begin after the last year of seeding, fertilization, irrigation, or other work, excluding approved husbandry practices.

357.200. Vegetation parameters will equal or exceed the approved success standard during the growing seasons for the last two years of the responsibility period. The period of extended responsibility will continue for five or ten years based on precipitation data.

357.210. Since Lila Canyon has an average annual precipitation of less than 26.0 inches this section is not applicable.

357.220. The mine plan area averages nine inches at the lowest elevation (area of greatest disturbance) to fourteen to sixteen inches at the highest elevation. Lila Canyon Mine will assume the ten year bond liability period.

357.300. Husbandry Practices - General Information

357.301. Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed area extending the bond liability period on a site specific case scenario.

357.302. Husbandry practices proposed for the reclaimed areas are not necessitated by inadequate grading practices, adverse soil conditions, or poor reclamation procedures.

357.303. The Division will consider the entire area that is bonded within the same increment, as defined in R645-301-820.110, when calculating the extent of area that may be treated by husbandry practices.

357.304. If it is necessary to seed or plant in excess of the limits set forth under R645-301-357.300, the Division may allow a separate extended responsibility period for these reseeded or replanted areas in accordance with R645-301-820.330.

357.310. Reestablishing trees and shrubs

357.311. Trees or shrubs may be replanted or reseeded at a rate of up to a cumulative total of 20% of the required stocking rate through 40% of the extended responsibility period.

357.312. Lila Canyon Mine has incorporated wood plant / tree seeding into the seed mix (see TABLE 3-4). If after two years following seeding and mulching it is apparent that woody plant density / tree cover appear to be insufficient for bond release; the mine may elect to re-enter selected areas and augment the direct seeding with either / or containerized or bare root seedlings, this determination will need to be made on a site specific bases. The goal for bond release is the establishment of 1500 woody plants per acre.

357.320. Based on similar reclamation projects in adjacent areas, the need to control weeds other than by selected removal is unlikely. In the unlikely event that weed control is required by chemical means, R645-357357.321 will be followed. In the unlikely event that weed control is required by Biological means, R645-357.323 will be followed. In the unlikely event that weed control is required by mechanical means, R645-357.322 will be followed.

357.321. In the unlikely event that weed control is required by Chemical means, R645-357.321 will be followed by mine personnel.

357.322. In the unlikely event that weed control is required by Mechanical means, R645-357.322 will be followed by mine personnel.

357.323. In the unlikely event that weed

control is required by Biological means, R645-357.323 will be followed by mine personnel.

357.324. In the unlikely event that weed control practices damage desirable vegetation, R645-357.324 will be followed by mine personnel.

357.330. Wildlife habitat is the priority post mining land use. As such, control of wildlife is not anticipated.

357.331. Wildlife habitat is the priority post mining land use. As such, control of wildlife is not anticipated.

357.332. Mine personnel do not anticipate a need to implement control measures for small mammals or insects. However, in the unlikely event that control is necessary, R645-357.332 will be followed. The Division must approved animal control methods sited in R645-357.332.

357.340. Natural Disasters and Illegal Activities Occurring After Phase II Bond Release. Where necessitated by a natural disaster, excluding climatic variation, or illegal activities, such as vandalism, not caused by any lack of planning, design, or implementation of the mining and reclamation plan on the part of the Permittee, the seeding and planting of the entire area which is significantly affected by the disaster or illegal activities will be allowed as an accepted husbandry practice and thus will not restart the extended responsibility period. Appendix C of the Division's "Vegetation Information Guidelines" references publications that show methods used to revegetate damaged land.

Examples of natural disasters that may necessitate reseeding which will not restart the extended responsibility period include wildfires, earthquakes, and mass movements originating outside the disturbed area.

357.341. The extent of the area where seeding and planting will be allowed will be determined by the Division in cooperation with the Permittee.

357.342. All applicable revegetation success standards will be achieved on areas reseeded following a disaster, including R645-301-356.232 for areas with a designated postmining land use of forestry or wildlife.

357.343. Seeding and planting after natural disasters or illegal activities will only be allowed in areas where Phase II bond release has been granted.

357.350. No Irrigation is anticipated.

357.360. Rills and gullies in excess of eight inches width and / or depth will be repaired on a seasonal bases. Repairs will be made in such manner that minimizes additional disturbance and yet is cost effective based on site specific conditions.

357.361. After the first 20% of the extended responsibility period but prior to the end of the first 60% of the responsibility period or until Phase II bond release, whichever comes first, highly erodible area and rill and gully repair will be considered augmentative, and will thus restart

the responsibility period, if the area to be repaired is greater than 3% of the total disturbed area or if a continuous area is larger than one acre.

357.362. The extent of the affected area will be determined by the Division in cooperation with the Permittee.

357.363. The area affected by the repair of highly erodible areas and rills and gullies is defined as any area that is reseeded as a result of the repair. Also included in the affected areas are interspacial areas of thirty feet or less between repaired rills and gullies. Highly erodible areas are those areas which cannot usually be stabilized by ordinary conservation treatments and if left untreated can cause severe erosion or sediment *damage.*

357.364. The repair and/or treatment of rills and gullies which result from a deficient surface water control or grading plan, as defined by the recurrence of rills and gullies, will be considered an augmentative practice and will thus restart the extended responsibility period.

357.365. The areas of concern on the initial reclamation are those natural drainage channels which will be reconstructed during the earth moving phase of reclamation. Specific design and specifications are included in Chapter 7 (Drainage Design). All regraded areas in excess of three percent slope will be sacrificed to aid in the

retention of moisture and minimize erosion. Areas in excess of 3:1 slopes will receive additional mulch and tac to facilitate vegetation establishment.

358. Protection of Fish, Wildlife Values: Mine personnel will be trained annually on environmental awareness, a portion of the training will deal with wildlife concerns, such as avoidance during stress periods, caution in driving to and from work during peak usage periods, recognition of any threatened and endangered species etc. Speed limits will be posted to minimize vehicular / wildlife accidents. In addition, all suitable water encountered during mining will be discharged in such a manner to make it available to wildlife.

358.100. Appendix 3-3 is a letter from U.S. Fish and Wildlife Service identifying all threatened and endangered species that could occur in the permit area or within a one-half mile proximity. All mine personnel will be trained about these species and notify the environmental coordinator at the mine. The environmental coordinator will confirm, if possible, the identification, notify USFWS and the Division, and then take what ever actions are necessary to safeguard both the species and it's habitat.

In addition, a threatened and endangered species inventory will be conducted prior to any disturbance. Historical as well as current threatened and endangered inventories are included in Appendix 3-4.

Prior to any new surface disturbance a raptor inventory will be conducted to ensure that no raptors or their nests or young would be adversely impacted through any mining or mine related activity. A copy of historical raptor data as well as current survey results are attached as Appendix 3-5.

A one-half mile buffer zone of no new disturbance during critical nesting periods will be maintained during that portion of the year that the nest sites are active.

As part of normal mining operation requirements, the Permittee must submit all results of the raptor surveys to the Division in Annual Reports and must immediately contact the Division, BLM, and USFWS following any raptor survey that shows that eagles are tending nests or nesting. The agencies will immediately coordinate to determine if the Permittee must implement appropriate measures. If the agencies recommend mitigation, the Permittee must submit all plans to the Division for incorporation into Appendix 3 of the MRP.

In the event of unforeseen changes in construction or mine plans, or in the case of emergency situations that may force the Permittee to conduct activity near or within the 0.5 mile buffer zone of raptor nest and during raptor exclusionary periods (February 1 to July 15 for golden eagles), the Permittee will immediately contact the Division, BLM, DWR, and USFWS. The agencies will immediately coordinate to determine appropriate measures that may include conducting ground surveys, in coordination with DWR, to determine if birds are tending nests or nesting and possibly determine the life stage of the offspring; developing a mitigation plan, in coordination with the agencies, for possible impacts to nests or birds; or ceasing operations until the end of breeding season to avoid 'take'. If the agencies recommend surveys, the Permittee must submit all survey results to the Division in Annual Reports. If the agencies recommend mitigation, the Permittee must submit all mitigation plans to the Division for incorporation

358.200. No coal mining and reclamation operations will be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nests, or any of the eggs.

358.300. This section is addressed in 358.200.

358.400. There are no wetlands and / or riparian areas within the area of potential disturbance.

358.500. Each operator will, to the extent possible using the best technology currently available:

358.510. All power and transmission lines will be designed with the best technology available to safeguard raptors.

358.520. All structures; fences, conveyors etc., will be designed to allow free movement of large mammals except in those areas where it is necessary to preclude large animals for their own safety; example: power substations, oil storage area etc.

358.530. All structures; fences, conveyors etc., will be designed to allow free movement of large mammals except in those areas where it is necessary to preclude large animals for their own safety; example: power substations, oil storage area etc.

WordPerfect Document Compare Summary

Original document: S:\Lila\2022\L22-001 - Add Lease Mods\Originals\Chapter 4.wpd
Revised document: S:\Lila\2022\L22-005 - LW Mining Add Lease Mods\Chapter 4 Edits - LW Mining Add Lease Mods.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 119 Deletions, 115 Insertions, 0 Moves.

Horse Canyon Extension
Lila Canyon Mine

Chapter 4
Land Use & Air Quality

Volume 3 of 7

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CHAPTER 4

400 LAND USE AND AIR QUALITY

410. Premining and Postmining Land Use: Pre-mining land use of the Lila Canyon permit area includes grazing, wildlife habitat, coal mining, and limited recreation, such as hunting. Other than grazing no agricultural activities have been or are currently being performed in the permit area.
Post-mining land use will not differ from land use as defined prior to the construction of the mine. Post-mining land use will include grazing, wildlife habitat, and recreational activities.

411. Environmental Description

411.100 Pre-mining land use of the Lila Canyon permit area includes grazing, wildlife habitat, coal mining, and limited recreation, such as hunting. Other than grazing no agricultural activities have been or are currently being performed in the permit area.

411.110 Pre-mining land use of the Lila Canyon permit area includes grazing, wildlife habitat, coal mining, and limited recreation, such as hunting. Other than grazing, limited agricultural activities have been or are currently being performed in the permit area. The mine permit area has not been conducive to agricultural practices due to lacking water sources, the steep, rugged terrain, and poor soil types.

To help minimize confusion a summary of Lila Canyon Permit Extension acreage is listed below:

Total federal and state coal currently held by the permittee:
5,549.016,821.65 acres. Shown on Table1-1.

Total Ppermitted surface acres:
5,992.07343.19 acres is a combination of federal, state and private lands. S shown in Table 4-2, 4-2A, and described in Section 116.100.

Surface disturbance area:

40.~~26~~11 acres discussed is Section 116.100, Section 542.200, Appendix 5-8. Includes areas of undisturbed within the disturbed area.

Top Soil removal / Actual Disturbance:

3~~7~~3.~~02~~99 Acres discussed in Section 232.100. This is the actual area~~-~~ anticipated to be disturbed for the life of the mine.

The permit area for the Lila Canyon mine is depicted on Plate 4-1. Included in this map are: the boundary of the permit area, the area which will include surface facilities, and the new portals. Existing roads, power lines, and railroads are identified. Private, federal, and state ownership are also identified on this plate. Wildlife habitats have been identified on Plate 3-1 and grazing allotment boundaries are depicted on Plate 4-2.

Table 4-1 lists the various owners of land within and around the permit area. The permit area is approximately ~~5992.07~~5,343.19 acres. Within the permit area, ~~1446~~537.~~64~~20 acres comprise private land and ~~289~~60.0~~6~~0 acres comprise ~~s~~State lands. The remaining 4,~~256~~745.~~37~~99 acres is federal land owned and managed by the United States Bureau of Land Management (BLM). Table 4-2 describes the surface ownership and Table 4-2A describes the coal ownership of the permit and surrounding area.

In 2018, Emery County Coal Resources, Inc. acquired coal lease #ML-53812-OBA from the State of Utah School and Institutional Trust Lands (SITLA), see Appendix 1-10a. The State of Utah owns the land and coal in this lease area. SITLA manages the land and coal for the State of Utah. The coal and land contained within this lease is not a part of the permit area as noted on Plates 4-1 and 5-4.

In 2021, Emery County Coal Resources, Inc. received modifications to federal coal leases #UTU-014218 and #UTU-0126947, see Appendix 1-9a. The land and coal located within these federal leases is owned and managed by the BLM. Only portions of these coal lease modifications are a part of the permit area as noted on Plates 4-1 and 5-4.

Lila Canyon lies within a region identified by the BLM as the Range Valley Mountain Habitat Management Plan Area (U-6-WHA-T4). This region was designated as such by a technical committee comprising state, federal, local government agencies and private citizens. This Habitat Management Plan area was established in September 1991 to provide management for the wildlife species of the area, including federally protected wildlife and plant species, big game, upland and small game waterfowl, unique and limited high value wildlife habitat, and access management. Big game and raptor habitat within the Lila Canyon Mine permit area, along with the Range Valley Mountain HMA, have been identified on Plate 3-1.

Table 4-1

ENTITY	OWNER	LAND USE
Federal Government	U.S. Bureau of Land Management	Range Valley Mountain Habitat Management Plan U-6-WHA-T4 *Federal Coal Leases:* ~~*U-0126947*~~ ~~*U-014217*~~ ~~*U-014218*~~ ~~*SL-066145*~~ ~~*SL-066490*~~ ~~*SL-069291*~~ UTU-0126947 (Tracts 1 and 2) UTU-014217 UTU-014218 (Tracts 1 and 2) UTSL-066145 UTSL-066490 (Tracts 1 and 2) UTSL-069291 *Federal Grazing Allotments*: Little Park Coon Spring Cove Icelander Range Creek ~~*Areas of*~~*Federal Wilderness* ~~*Character*~~ ~~Turtle~~Desolation Canyon ~~WSA~~Wilderness
State Government	State of Utah	*State Coal Leases:* ML-53812-OBA
County Government	Emery County*	
Private	Josiah and Etta Marie Eardley ~~Intermountain Power Agency~~ ~~Bronco Coal Company~~ ~~College of Eastern Utah~~ ~~Brent Davies*~~Lyman Family Farm, Inc.* First Light Development, LLC* William Marsing Livestock, Inc.* Levada EF Five, LLC* Emery County Coal Resources, Inc.	

*Close proximity to permit area

Table 4-2
Surface Ownership Permit Area ~~Both Horse Canyon and Lila Canyon~~

Township	Range	Section	State Acres	Federal Acres	Private Acres
~~ABABAB~~15~~6~~ S	14 E				
		~~3360.70 (2)49.00 (4)3423.62 (2)25.68 (4)25.20 (3)16 S14 E2248.300.763127.03 204.30 (4)4180.00 (4)520.00 (1)840.00 (1)9120.00 (4)~~10			~~28.2030.85 (1)~~76.00 (1)
		11		~~14.78~~108.86	~~120.19 (2)~~341.20 (2)
		12	40.00	600.00	
		13		640.00	
		14		640.00	
		15		15~~7~~8.~~50~~45	120.00 (1)
		22		40.00	
		23		560.00	
		24		640.00	
		25		320.00	
		26		80~~16 S15 E19110.00 30190~~.00	
				~~State Acres Federal Acres Private Acres~~	
16 S	15 E				~~A~~
~~B~~	~~A~~	~~B~~18	~~A~~20.00	~~B~~79.34	
		19		509.32	
		29		60.00	

		30		310.02	
SUB TOTAL			24860.300 0	404745.76 178.81408 6.36909.44 99	537.20
~~Total "A" Horse Canyon1327.75Total "B" Lila Canyon4664.32~~GRAND TOTAL			5992.075343.19		

Please note: (1) Emery County Coal Resources, Inc.
(2) Josiah and Etta Marie Eardley

Table 4-2A
Coal Ownership Permit Area ~~Both Horse Canyon and Lila Canyon~~
By Lease

Township	Range	Section	Federal Lease Number unless noted as Utah State Lease	State Acres	Federal Acres
~~Private AcresABAB AB15 S14 E33SL-04651260.70 49.90 (3)34SL-04651223.62 25.68 (3)25.20 (2)~~16 S	14 E	~~2248.300.76~~ 3	~~SL-066145~~UTSL-066145		~~221.27110.06 (4)4189.00 (4)5200~~.00 ~~(1)840.00 (1)9120.00 (1)~~
		10	~~SL-066145~~UTSL-066145		~~59.05~~76.00
		11	~~SL-066145~~UTSL-066145		~~134.97~~130.06
			~~SL-066490~~UTSL-066490		320.00
		12	UTSL-066490		320.00
			~~12SL-066490~~UTU-014218 - Tract 1		320.00
		13	UTU-0126947 - Tract 1		320.00
			~~U-014218320.0013U-0126947320.00SL-066490~~UTSL-066490		320.00
		14	~~SL-066145~~UTSL-066145		160.00

			~~SL-066490~~UTSL-066490		480.00
		15	~~SL-066490~~UTSL-066490		8~~0~~5.00
			~~SL-066145~~UTSL-066145		120.00
			BLM (Surface Only - No Coal)		7~~73~~.~~50~~45
		22	~~SL-066490~~UTSL-066490		40.00
		23	~~SL-066490~~UTSL-066490		560.00
		24	~~SL-066490~~UTSL-066490		240.00
			~~SL-069291~~UTSL-069291		80.00
			~~U-0126947~~UTU-0126947 - Tract 1		320.00
		25	~~SL-069291~~UTSL-069291		160.00
		~~Table 4-2A Continued Coal Ownership Permit Area Both Horse Canyon and Lila CanyonU-0126947~~	UTU-0126947 - Tract 1		120.00
			~~U-014217~~UTU-014217		40.00
		26	~~SL-066490~~UTSL-066490		40.00
			~~SL-069291~~UTSL-069291		40.00
16 S	15 E	~~19~~7	UTU-014218 - Tract 2		0.00
		18	UTU-014218 - Tract 2		69.34
~~U-0126947~~			UTU-0126947 - Tract 2		~~110~~30.00
		19	UTU-014218 - Tract 2		~~30~~34.73
~~U-0126947~~			UTU-0126947 - Tract 1		109.79
			~~190~~UTU-0126947 - Tract 2		364.~~00~~80

Table 4-2A (continued)
Coal Ownership Permit Area
By Lease

Township	Range	Section	Federal Lease Number unless noted as Utah State Lease	State Acres	Federal Acres
~~Private Acres~~		29	UTU-0126947 - Tract 2		60.00
		30	UTU-0126947 - Tract 1		190.02
			UTU-0126947 - Tract 2		120.00
				~~A~~	~~BABAB~~

SUB TOTAL	~~248.300.76499 .614663.56579 .84~~0.00	~~Total "A" Horse Canyon1327.75Total "B" Lila Canyon4664.32~~5343.19
GRAND TOTAL	~~5992.07~~5343.19	

Please note: (1) ~~UEI~~Emery County Coal Resources, Inc.
(2) Josiah and Etta Marie Eardley
~~(3) Bronco Coal Company~~
~~(4) CEUF~~

Federal coal leases relative to the Lila Canyon Mine permit area are depicted on Plate 5-4. There are six federal coal leases comprising the permit area, and three lease modifications; all of which are assigned to ~~Utah American Energy~~Emery County Coal Resources, Inc. The acreage for each lease and lease modification is presented on Table 1-1.

Grazing allotments in the Lila Canyon Mine permit area are depicted on Plate 4-2. These grazing allotments have remained unchanged for the past 10 years. The permit area is located primarily within the Little Park Allotment, and to a lesser extent within the Cove Allotment. Table 4-3 , along with Plate 4-2, describes the allotments, owners, acreage, and animal unit month (AUM's).

The boundary of the ~~Turtle~~Desolation Canyon Wilderness ~~Study Area (WSA)~~ in relation to the permit area is shown on Plate 4-4.

Table 4-3 Grazing Allotments

ALLOTMENT#	ALLOTMENT	OWNER	ACREAGE	AUM's
24031	Cove	Boyd Marsing	12,754	750
34029	Coon Spring	Boyd Marsing	6,879	300
437039	Icelander	James Jensen Dix Jensen	43,897	3016
34066	Little Park	Edwin Jensen Glen Jensen	18,473	242
24096	Range Creek	Waldo Wilcox	43,900	284

411.120 Land use Description

The Lila Canyon Mine permit area has not and does not support a diversity of land uses due to soil types, topography, and hydrology of the area. The land surface of the permit area consists of rugged, southwest facing cliffs of the Book Cliffs. Many of which are deeply dissected by steep ephemeral drainages. The elevation in the mine permit area ranges from approximately 5,600 feet to 5,800 feet near and around the surface facilities site, to approximately 6,500 feet at the proposed portals location. The elevations along the ridge top predominantly range between 8,800 feet and 9,300 feet. The elevation at the top of Lila Canyon, near the mouth of the creek, is 8,530 feet. Large boulders and sandstone slabs clutter the sides and bottoms of cliff areas, as a result of cliff weathering. The base of the Book Cliffs consists of Mancos Shale Lowlands, of numerous southwesterly oriented ridges and drainages.

Three noteworthy drainages lie within and around the permit area. Grassy Wash originates in the area between Horse Canyon and Lila Canyon and flows southwest and south toward the Price River. The transportation and utility corridor will depart from Highway 191, Route 6 at the northeast corner of Section 1, Township 17S Range 13E and progress in the northeast direction to the mine permit area. The new road will cross the Grassy Wash drainage near the southwest corner of section 29, Township 16S Range 14E. The Marsh Flat drainage originates within close proximity of the mine permit area at Township 16S Range 14E Section 35. This drainage flows in the southwest direction toward the Price River. The Little Park Wash bisects the permit area in the north-south direction. This drainage enters the north boundary of the permit area at an approximate elevation of 7,600 feet and leaves the southern bound of the permit area at an approximate elevation of 6,200 feet. This drainage essentially parallels the western edge of the Book Cliffs and flows throughout the permit area at elevations of above 6,400 feet. Little Park Wash eventually drains into the Price River about eight miles down gradient of the southern

bound of the mine permit area.

Water uses within the mine permit area are limited to stock watering, mining, and domestic uses at mine sites. Sources for water within and around the Mine Permit area include various springs, ephemeral washes, Little Park Wash, Horse Canyon Creek, and one underground water well historically used for sprinkling purposes for operation and maintenance of the mine. A water rights search was conducted for the mine permit area and is included within Table 7-2.

Due to topography, limited available water resources, soil types, limited access, and remote location, it is evident that the land within the mine permit area historically has not been capable of supporting a diversity of uses. The greatest variety of compatible uses for this land is a combination of recreation, wildlife habitat, grazing, and coal mining.

411.130 According to Bryant Anderson, administrator of Emery County Planning and Zoning (Anderson, 1998), all land within the Mine Reclamation Permit area is zoned M&G-1 for mining and grazing. Grazing is the most pervasive existing use of the land in the Lila Canyon area.

The BLM is the land manager for most of the area within the permit. The permit area consists of 5,~~992.07~~343.19 acres, of which the BLM manages ~~4256~~4,745.~~37 of the~~99 acres. Within the permit area, there are ~~1446~~537.~~64~~20 privately owned acres, and ~~289~~60.0~~6~~0 State owned acres. Refer to Plate 4-1 for ownership boundaries.

The former Turtle Canyon Wilderness Study Area (WSA) ~~overlaps~~, which overlapped a small portion of the permit area, was released by Congress back to multiple use management by Section 1234 and 1231 of Public Law 116-9, the "John D. Dingell, Jr. Conservation, Management, and Recreation Act" (March 12, 2019). Thus, the Turtle Canyon WSA no longer exists. The newly established Desolation Canyon Wilderness does not overlap the permit area. No surface facilities or associated impacts will occur

within the ~~WSA~~wilderness area.

411.140. Cultural and historical resources investigations have been performed in the vicinity of the permit area in the past. Significant studies include "An Archaeological/Historical Inventory of Kaiser Steel corporation Horse Canyon Mine Lease, East Carbon County, Utah". This report was written in March 1986 by Don Southworth and Asa S. Nielson for the Mining and Reclamation Plan submitted to the Division by Intermountain Power Agency. A cultural Resource Inventory of the Kaiser Steel Corporation South Lease Mine Property and a Test Excavation (42EM1343 in Emery County, East Central Utah conducted by Rebecca Rauch (1981). These and additional survey reports of the area are included in Appendix 4-1.

Detailed archeological ground surveys were conducted at the Lila Canyon mine site and associated disturbed area, by Montgomery Archaeological personnel. These surveys were conducted in 1998, 1999, and 2006 and are included within Appendix 4-1.

Within the Horse and Lila Canyon Permit areas and the nearby Southern portion of the Kaiser Steel Corporation South Lease mine property, there are five known historic resources that are either on or eligible for listing on the National register. There is one listed site (42EM1222) 2.5 miles from the facility area. One eligible site (42EM1343) has been recovered and another (42EM2517) will be recovered prior to construction. The other two eligible sites (42EM2255 and 42EM2256) are not expected to be impacted by operations.

411.141. Historic resources are depicted on Plate 4-3.

411.141.1 The locations of listed or eligible cultural and historical resources in the area are discussed in Appendix 4-1 and shown on Plate 4-3.

There are no publicly owned parks.

411.141.2 No cemeteries are located in or within 100 feet of the proposed permit area.

411.141.3. No land within the proposed permit area is within the boundaries of any units of the National System of Trails or the Wild and Scenic Rivers System.

411.142. Consultation efforts for cultural and historical resources are in process. Final concurrence from the SHPO will be included in this MRP prior to permit approval.

~~UEI~~ECCR will also include measures to prevent or minimize adverse impacts to listed sites within the permit area, if sites are discovered during the consultation process.

411.143. The Operator has provided archeology survey reports. Three of these surveys included intensive survey and analysis of areas that would be directly impacted by the Lila Canyon mining operations.

Two other surveys include spot surveys and analysis of areas that are expected to have a low probability of indirect mining impacts to the surface.

411.144 Of the 22 cultural and historical sites identified in the area, only one, 42EM1222, is listed on the National Register of Historic Places. This site is approximately 2.5 miles from the Lila Canyon surface facility and therefore, impacts are not expected to occur at this site.

BLM will develop a recovery plan for 42EM2517 that will occur after mine plan approval and before construction.

411.200. Previous mining and exploration activities have occurred within the proposed permit area within the last twenty years. In the mid-1950's, the road along the bottom of Lila Canyon was constructed to allow exploration of the resources. The road intersects the Horse Canyon Highway approximately 1.4 miles to the north and loops back to the south to intersect

Highway 191 and 6 to the south (see Plate 4-1). Two sealed breakouts (Plate II-2 of Horse Canyon Plan) are located in the left fork of Lila Canyon where the Lila Canyon fan was installed in the 1950's. The Lila Canyon fan was used until the closure of Horse Canyon post 1977, and therefore, the current Coal Regulatory Program has jurisdiction over this disturbance and it is included in the permit area.

411.210. Coal was removed from the outcrop of Horse Canyon and transported back through the Horse Canyon Mine. Excavation indicates only a small amount of coal was previously removed.

411.220. In the past, coal was removed from the Sunnyside Seam.

411.220. Because the old portal has been sealed, it is difficult to ascertain the total amount of coal which had been removed.

411.240. The exact date of the coal outcrop excavations is unknown. It is believed that coal was removed during the late 1950's or early 1960's.

411.250. The land use prior to outcrop excavation was the same as currently exists within the area. Wildlife habitat, grazing, and coal exploration was previously and is currently the predominant land use in the area.

412. Reclamation Plan

412.100. Post mining land use will be the same as currently exists today, that being: wildlife habitat, grazing, and limited recreational activities.

412.110. After all mining activity has been completed and the disturbed area regraded and reseeded, the site will enter a post reclamation phase. During the first ten years, the site will be monitored for vegetative success and erosion control. The reclaimed, revegetated area may be fenced to discourage livestock grazing until final reclamation has been achieved and the reclamation bond released.

Support activities to achieve the post-mining land use plan included: site monitoring, remedial actions including regrading, reseeding, remulching and replanting; and fencing as necessary to restrict access and grazing on the site until the reclamation bond has been released.

412.120. After the reclamation bond has been released, the property will be returned to the care of the surface land owners, which, for the most part, is the BLM. Management of the site will be according to the BLM's current range management plan for the region existing at that time.

412.130. Since premining land use is the same as postmining land use this section is not applicable.

412.140. This post-mining program is in accordance with the Emery County and BLM management framework plans. See Correspondence with Emery County Zoning Administrator, Bryant Anderson, and the BLM, regarding the zoning of lands within the Lila Canyon Extension included within Appendix 4-2. A Large Scale Industrial Site Plan was required by the county for any significant mining or industrial operations. A copy of the approval for the Large Scale Industrial Site Plan can be found in Appendix 4-2.

Based on the desire expressed by the BLM and/or Emery County, at the time of reclamation of the mine site, mine personnel would agree to work with the BLM and/or Emery County to achieve future land use objectives.

412.200. A Large Site Plan Approval has been filed with Emery County regarding the plans to mine coal in the Lila Canyon area. The approval process and a copy of this application are included in Appendix 4-2. A copy of the BLM post mine land use determination can be found in Appendix 4-2.

412.300. The mine operator does not propose to leave fills containing excess spoil.

413. Performance Standards

413.100 All disturbed areas will be restored to the conditions equal to or better than existed prior to disturbance.

413.200 Wildlife habitat and grazing will resume following reclamation activities of the mine site. No alternative postmining land uses, nor higher or better uses are being proposed.

413.300. No alternative post-mining land use is being proposed at this time.

414. Premining Land use: It is the operations intent to return the mine properties to its pre-mine use. The reclamation practices to be implemented as outlined in chapter five have a proven record of success.

420. Air Quality.

421. Compliance with the Clean Air Act: Mining and reclamation operations will be conducted in compliance with the requirements of the Clean Air Act and other applicable state, federal statues.

422. Compliance Efforts: Appendix 4-3 contains the "Intent to Approve" and the actual "Approval Order" for the air quality permit obtained from the Utah Bureau of Air Quality. The initial air quality permit is for 1.5 million tons. Revisions to the air quality permit will be made to accommodate future increases in production.

423. Since Lila Canyon Mine is an underground operation this section is not applicable.

423.100 Since Lila Canyon Mine is an underground operation this section is not applicable.

423.200 Since Lila Canyon Mine is an underground operation this section is not applicable.

424. Since Lila Canyon Mine is an underground operation this section is not applicable.

425. Since Lila Canyon Mine is an underground operation this section is not applicable.

REFERENCES

Stephens, Don, U.S. Bureau of Land Management, Federal Coal Leases Map, 1990.

Division of Water Rights, PLAT program

Emery County Recorder's Office

Appendix 4-4

Turtle Canyon CR Report

To the CONFIDENTIAL File

WordPerfect Document Compare Summary

Original document: K:\Lila\2022\L22-001 - Add Lease Mods\Originals\Chapter 5.wpd
Revised document: K:\Lila\2022\L22-001 - Add Lease Mods\L22-001b - Add Lease Mods - 1st Mining Only\Chapter 5 Edits - L22-001b - CM Mining Only.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 27 Deletions, 27 Insertions, 0 Moves.

Horse Canyon Extension
Lila Canyon Mine

Chapter 5
Engineering

Volume 4 of 7

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Chapter 5

500. ENGINEERING

510. Introduction

This section presents the engineering portion for the Lila Canyon Extension to the Horse Canyon Mine Reclamation Plan and is based upon previous publications, permit applications for the adjacent Sunnyside and South Lease areas and design which follows basic engineering standards. The objective of this chapter is to provide sufficient engineering design to support the mining and reclamation plan for the Lila Canyon Mine (ACT/007/013) and to satisfy the rules found in R645-301-500. All of the activities associated with the coal mining and reclamation operations are designed, located, constructed, maintained, and reclaimed in accordance with the operation and reclamation plan. The engineering section of the permit application is divided into the introduction, the operation plan, operational design criteria, reclamation plan, and performance standards. All design criteria associated with the operation and reclamation plans have been met.

511. General Requirements.

511.100 The permit application includes a description of the proposed coal mining and reclamation operations with appropriate maps, plans, and cross sections.

511.200 A description of the proposed mining operation and its potential impacts to the environment as well methods and calculations utilized to achieve compliance with design criteria are addressed within this chapter.

511.300 A description of the proposed reclamation plan is included in this chapter.

512. Certification

512.100. Cross Sections and Maps that require certification have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, with assistance from experts in related fields when needed. Cross Sections and Maps will be updated as needed or required by the Division. Listed below are some of the maps and cross sections that have been certified by a qualified registered

professional engineer.

512.110. A map showing the extent of known existing mine workings and the approximate year mined has been included and certified by a qualified registered professional engineer and included as Plate 5-1.

512.120. All Surface facilities (temporary and long-term) and operations are shown on the appropriate maps, and have been certified by a qualified registered professional engineer.

512.130 Maps showing final surface configuration with cross sections have been included and certified by a qualified registered professional engineer. (See Plate 5-6, 5-7c, and Appendix 5-4)

512.140 Appropriate hydrology drawings and cross sections have been certified by a qualified registered professional engineer. (See Chapter 7)

512.150 Geologic cross sections and maps that are required to be certified, have been certified by a qualified registered professional engineer. See Chapter 6 and Plate 7-1B.

512.200 Plans and Engineering Designs which may include: Excess spoil piles, durable rock fills, coal mine waste, impoundments, primary roads and variances from approximate original contour. These Plans and Designs have been certified by a qualified registered professional engineer if appropriate.

512.210 Lila Canyon Mine is an underground operation, therefore it is anticipated that no excess Spoil will be produced. This section does not apply.

512.220 The professional engineer experienced in the design of earth and rock fills has certified that the durable rock fill

design will ensure the stability of the fill and that the fill meets design requirements.

512.230 The professional engineer experienced in the design of coal mine waste piles has certified the design of the coal mine waste disposal facility. (See Appendix 5-7)

512.240 Prudent engineering practices are used in the design and construction of impoundments in the permit area. The impoundment designs have been certified by a qualified registered professional engineer. (See Plates 7-6a and 7-6b)

512.250 The professional engineer has certified the design and construction or reconstruction of primary roads as meeting the appropriate design criteria.

512.260 The operator is not requesting a variance from the approximate original contours (AOC).

513. Compliance With MSHA Regulations and MSHA Approvals.

513.100 Neither Coal processing waste dams nor embankments are anticipated during the term of this permit. Therefore, this section is not applicable.

513.200 Planned impoundments and sedimentation ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a). Therefore, this section is not applicable.

513.300 Underground development waste transported to the surface, coal processing waste and excess spoil will not be disposed of underground. However, material such as overcast material, rock falls, and slope material, not transported to the surface, may be disposed of underground according to the appropriate MSHA regulations.

513.400 Refuse piles meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215 and all appropriate R645 regulations. (See Appendix 5-7)

513.500 Shafts, drifts, adits, tunnels, exploratory holes, entryways or other opening to the surface from the underground will be capped, sealed, backfilled or otherwise properly managed consistent with MSHA, 30 CFR 75.1711.

513.600 Surface water discharges into the underground mine workings is not anticipated or planned, Therefore, this section is not applicable.

513.700 Surface mining within 500 feet to an active underground mine is not planned nor anticipated. Therefore, this section does not apply.

513.800 Coal mine waste fires plans will be submitted to MSHA and the Division for their approval prior to extinguishing any coal mine waste fires. (See Appendix 5-3)

514. Inspections

All engineering inspections, except the quarterly inspections of impoundments not subject to MSHA, will be conducted by a qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer.

514.100 Lila Canyon is an underground operation and it is not anticipated that any spoil will be produced. Therefore, this section does not apply.

514.200 Refuse Piles. A professional engineer or specialist experienced in the construction of similar earth and waste structures will inspect the refuse pile during construction.

514.210 Regular inspections by the engineer or specialist will also be conducted during placement and compaction of coal mine waste materials. If it has been determined that a danger of harm exists to the public health and safety or the environment, more frequent inspections will be conducted. Inspections will continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.

514.220 The refuse pile inspections will be performed at least

quarterly throughout construction and during the following construction periods:

514.221 In addition to quarterly inspections, an inspection will be performed during foundation preparation which includes the removal of all organic material and topsoil;

514.222 Since no under-drain or protective filter systems are planned, this section is not applicable.

514.223 In addition to quarterly inspections, an inspection will be performed during the installation of the final surface drainage systems.

514.224 In addition to quarterly inspections, an inspection will be performed after the final grading and the facility has been revegetated.

514.230 The division will be provided a certified report prepared by, or under the supervision of, the qualified registered professional engineer after each inspection. The report will certify that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and R645 Rules. This report will include statements stating the appearances of instability, structural weakness, and other hazardous conditions if found. (See Appendix 5-1)

514.240 Since protective filters and under-drain are not required in the current design criteria this section is not applicable.

514.250 Required refuse pile reports will be retained at or near the mine site in an area convenient to the resident agent and the qualified registered professional engineer. Appendix 5-1 is an example of the refuse pile inspection form.

514.300 Impoundments

514.310 A professional engineer or specialist experienced in the construction of impoundments will inspect impoundments.

514.311 During construction, inspections will be made on a regular basis, and upon completion of the ponds. The inspections will be performed at least yearly. Inspections will continue yearly until the pond is removed or the performance bond is released.

514.312 After each inspection the qualified registered professional engineer will promptly provide to the Division a certified report. This report will state that the impoundment has or has not been constructed and maintained as designed and in accordance with the approved plan and the R645 Rules. The report will include a discussion of any appearances of instability, structural weakness or other hazardous conditions. All so included in the report will be the depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation and any other aspects of the structure affecting stability.

514.313 Required impoundment inspection reports will be retained at or near the mine site in an area convenient to the resident agent and the qualified registered professional engineer. Appendix 5-2 is an example of the impoundment inspection form.

514.320 Since the pond contained in the Lila Canyon Project is less than 20 feet high and stores less than 20 acre-feet of water, it is not subject to MSHA, 30 CFR 77.216. Therefore, this section does not apply.

515. Reporting and Emergency Procedures.

515.100 If a slide occurs, the operator will telephone DOGM to notify

them of the situation and recommend remedial measures to be taken to alleviate the problem. Additional remedial measures required by DOGM will be implemented.

515.200 During impoundment inspections, any potential hazards noted will be reported to DOGM, along with measures to be implemented to eliminate the hazard.

515.300 In the case of temporary cessation of operations the following will apply:

515.310 All provisions of the approved permit will be complied with during temporary cessation or abandonment.

515.311 In case of temporary cessation, the operator will support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit.

515.312 Since Lila Canyon Mine is an underground operation, this section does not apply.

515.320 Prior to a temporary cessation of coal mining and reclamation operations which is expected to last longer than 30 days, or when a temporary cessation is extended longer than 30 days, the operator will submit to the Division a notice of intention to cease or abandon operations. The following will be included in the notice of temporary cessation.

515.321 The temporary cessation notice will contain the exact number of surface acres and the horizontal and vertical extent of subsurface strata included in the permit area. In addition, a description of the reclamation activities accomplished and activities such as backfilling regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

515.322 Since the Lila Canyon Mine is an underground operation, this section does not apply.

516. Prevention of Slides: Since the Lila Canyon Mine is an underground operation, this section does not apply.

520. Operation Plan.

At first glance it would appear to a non-mining person that the best access to ~~UEI's~~ECCR's leases would be from the existing (sealed) Horse Canyon portals using the current Horse Canyon surface disturbance. However, the existing Horse Canyon site is not suitable for a large longwall operation. The old Horse Canyon Mine was not designed to produce 4.5 million tons as will be Lila. Some strategic pillars in the old mains were extracted upon retreat preventing any future access. The number of entries in the old works is not adequate for ventilation purposes. Portions of the old mine are flooded preventing reentry. The distance from the old portals to the current leases would result in unacceptable travel times for crews and supplies. Rehabilitating and maintaining an old mine is extremely hazardous and expensive. As a result of the conditions described above it has been determined that new portals at the Lila Canyon site are the most logical and only feasible access to the permittee's coal leases.

Lila Canyon Current Temporary / Long-term Mine Facilities List

Current temporary and long-term structures and facilities are shown on Plate 5-2. The Keyed Mine Facilities from Plate 5-2 are numbered as follows:

Buildings

1) Temporary Bath House
2) Temporary Office Trailer
3) Temporary Office / Shop Building
4) Temporary Storage Shed (Wooden)
5) Temporary Storage Building (Metal)
7) Temporary Office Building
9) Temporary Storage Tent with concrete floor
22) Temporary Crusher/Screen Building
33) Shop / Warehouse Building

Utilities

No Number *Mine Substation*
8) Potable Water Tank
10) Power Poles

11) Electrical Transformer
12) Overhead Power Transmission Lines
13) Buried Power Transmission Lines
28) Electrical Grounding Field
37) Non-Potable Water Storage Tanks
40) Concrete Electrical Junction Box
41) Temporary Concrete Septic Tank

Mine Facilities

14) Rock Dust Silo
16) Temporary Underground Reclaim Room
17) Temporary Concrete Retaining Wall
18) Temporary Loadout Conveyor (48")
19) Temporary Loadout MCC Building
20) Temporary Loadout Structure
21) Temporary Crusher Conveyor (48")
23) Temporary Crushed Coal Conveyor (48")
24) Temporary Crusher MCC Building
25) Temporary Concrete Dozer Trap
27) Temporary Concrete Equipment Pad
30) Existing ROM Coal Conveyor from Underground (60")
31) Steel Portal Canopy Structure
32) Concrete Conveyor Bay at Belt Portal
34) Mine MCC Building / Electrical Tower
35) Backup Ventilation Fans
36) Main Mine Ventilation Fan / Electrical Tower
39) Chain Link Fencing
43) Temporary Conveyor Counterweight Structure
44) Jersey Barrier Guard Rails
45) Concrete Trash Chute
46) Gantry Lift Assembly

Support Facilities

No Number *Mine Facilities Access Road / Truck Loadout Road*
No Number *Rock Slopes*
No Number *Sediment Ponds*
No Number *Slope Access Road / Portal Access Road*
No Number *New Storage Pad*
No Number *New Storage Pad Access Road*
No Number *New Storage Pad Service Road*
No Number *Topsoil Pile*
6) Temporary Concrete Walkway

15) Temporary Fuel Storage Tanks
29) Sediment Pond Spillway Structure
42) Temporary Loadout Light Board
38) Powder and Cap Magazines

Note: Long-Term Underground Pipes are not shown.
Note: Culvert locations are shown on Plate 7-5.

A description of current temporary and long-term structures and facilities:

BUILDINGS

1) Temporary Bath House

The temporary bath house is shown on Plate 5-2. This complex is made up of interconnected portable structures (trailers and metal intermodal structures) and a concrete and wood-framed shower area. Shower and toilet facilities for all male employees are at this location. Female employees utilize a separate, nearby temporary trailer for showers and toilet facilities (see #2 below). The bath house provides a location for underground miners to change from clean street clothes to clothing suitable for underground use. The area provides showers for employees for use after their scheduled work shifts so they can clean up prior to returning home. The trailers and metal intermodal structures rest upon stacked concrete blocks for stability and leveling purposes. Once the long-term bath house is constructed, the temporary bath house and all supporting structures will be removed.

2) Temporary Office Trailer

The temporary office trailers are prefabricated, self-contained, modular trailers, similar to those often seen on construction sites. The trailers can be moved using a vehicle with a tow hitch. Each trailer typically contains two (2) or three (3) offices and one (1) restroom. Each trailer is equipped with a waste water storage tank for the rest room. The waste water storage tank is emptied on a regular basis. One (1) temporary office trailer has been modified to provide shower and toilet facilities for female employees similarly to the temporary bath house (see #1 above). An admin trailer located on the lower pad will consist of two temporary trailers, side by side, with a concrete pad in between, covered by an aluminum awning. This will include a set of metal stairs that will descend to connect to the access road for easy access of guests. The office trailers are used by mine personnel in support positions to mine operations. Multiple trailers are currently used. The locations of these trailers are shown on Plate 5-2. Once long-term office areas are constructed, the temporary office trailers and all supporting structures will be removed.

3) Temporary Office / Shop Building

The Temporary Office / Shop Building is shown on Plate 5-2. The building is a prefabricated metal building on a concrete foundation system, with a 4" thick concrete floor slab. The building is split down the middle width-wise with one side being the shop area, and the other office space for mine personnel in support positions to mine operations. The shop area is used to perform minor equipment repairs. The building measures approximately 30' by 62'. Once long-term offices and the long-term Shop/Warehouse have been constructed, the temporary office / shop building will be raised. A temporary shop structure will be assembled on the Temporary Storage Pad and is located on Plate 5-2 As-Built Surface Facilities. This structure will consist of a 40'x60' tent, similar to the storage tent already on site, and two conex trailers. There will be a 40'x40'x8" concrete pad underneath it.

4) Temporary Storage Shed (Wooden)

The temporary wooden storage sheds measure approximately 8'x8'x8' and 10' by 20' by 8' high, with a wooden floor structure. The sheds are used to store various equipment and supplies needed for mine operations. Multiple sheds are currently used. The locations of these sheds are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage sheds will be removed.

5) Temporary Storage Building (Metal)

The temporary metal storage buildings are prefabricated, metal, intermodal container used for storage. These structures are sometimes referred to as “conex containers.” The containers are typically 20' to 40' long by 8' wide by 8.5' high. These structures are used to store various equipment and supplies needed for mine operations. The metal storage structures typically provide a higher level of security than do wooden sheds. Multiple metal storage buildings are currently used. The locations of these buildings are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage buildings will be removed.

7) Temporary Office Building

The temporary office / storage building is shown on Plate 5-2. The office space is used by mine personnel in support positions to mine operations. The building measures 20' by 12' by 10' high. The building is a wood frame on a concrete foundation. The floor is a 4" thick concrete slab. Once the long-term office areas and Shop/Warehouse have been constructed, the temporary office building will be razed.

9) Temporary Storage Tent with Concrete Floor

The temporary storage tent is constructed of an arched metal wall/roof structure covered with a canvas overlay. The tent rests on a 6" concrete floor slab. Two tents are currently in use at the mine site. One tent measures 30' by 30'. The

other measures 70' by 48'. The tents are used to store large wares and supplies needed for mining operations that need some protection from the weather. The temporary storage tents with concrete floors are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage tents and associated concrete floor slabs will be removed.

22) Temporary Crusher / Screen Building

The temporary crusher / screen building is shown on Plate 5-2, and houses the screen and crusher assemblies. The screen assembly sorts the coal as it enters the building, via the temporary crusher conveyor (see #21 below), between the larger lump sizes that need to be crushed (2"-8" in size) and the smaller nuggets that do not need to be crushed (less than 2" in size). The crusher assembly reduces the larger 2" to 8" sized coal lumps to nuggets measuring less than 2" in size. The coal that is now 2" or less in size falls onto the crushed coal conveyor (see #23 below) and exits the building. The building itself is constructed of a wide flange steel frame and rests on a 12" thick monolithic concrete slab base. The building measures approximately 48' by 22', and stands approximately 58' at its peak. The temporary crusher / screen building has been constructed to meet MSHA regulations. Once the long-term coal handling facilities have been constructed, the temporary crusher / screen building will be razed.

33) Shop / Warehouse Building

The shop / warehouse building is shown on Plate 5-2. This building will be a long-term structure used to repair machinery and vehicles associated with mine operations, and shall store various wares associated with mine operations. The building will be 120 feet long by 60 feet deep. The roof will be sloped for drainage. The facility will be approximately 36 feet high at the peak of the roof. The building will be constructed of a poured concrete footing and foundation system and floor. The walls and roof will be of pre-fabricated steel. Several roll-up type overhead doors will allow vehicles to enter the building for repair and maintenance. One bay will have overhead doors on the front and rear of the building to allow trucks to enter the building on one side, load or off load wares or equipment, then exit the building through the opposite side of the structure. The building will also house a large capacity overhead crane that will be used to lift heavy objects and equipment. This structure will remain throughout the life of the mine, and will be removed at the time of final reclamation.

UTILITIES

Mine Substation

The mine substation is shown on Plate 5-2, and provides power to surface and underground areas of the mine property. The substation includes approximately

four transformers setting on a concrete pad approximately 20' by 20' by 12" and fully fenced. The total fenced area of the substation is approximately 215' by 112'. Power is fed into the transformers at 138 KVA and will be transformed down to usable voltages for both the surface and underground facilities. It is anticipated that voltages of 110V, 220V, 440V will be used on the surface, and 12,470 volts will be utilized underground. The mine substation is constructed to fulfill all appropriate MSHA regulations. The Mine Substation will remain throughout the life of the mine, and will be removed during final reclamation.

8) Potable Water Tanks

The potable water tanks are shown on Plate 5-2. Potable water is purchased off-site and is transported to the mine site via tanker truck, which in turn fills the tanks. The potable water is stored in one 15' diameter by 20' high metal tank and two (2) 20' by 8' by 8' high conex-type cubic tanks . Water from these tanks are used for toilets and showering in the temporary bath house (see #1 above). The round tank is set on a 15' by 15' concrete pad designed for adequate support of the tank. The cubic tanks are self-contained and rest on native soil. The location of the potable water tanks can be found on Plate 5-2. The potable water tanks will remain throughout the life of the mine, and will be removed during final reclamation.

10) Power Poles

Multiple wooden power poles are utilized throughout the disturbed area. Locations of power poles are shown on Plate 5-2. The power poles are large, upright wooden poles used to support overhead power transmission lines and other wires as needed. The power poles will remain throughout the life of the mine and will be removed during final reclamation.

11) Electrical Transformer

An electrical transformer is used to adjust and transfer electrical energy in electric power applications. Each transformer rests on a 4" thick concrete slab of suitable size to support the weight of the transformer. The transformer feeds various mine facilities. Multiple transformers are currently utilized. Their locations are shown on Plate 5-2. Transformers will be removed as their respective temporary facilities are removed and replaced upon the completion of long-term facilities).

12) Overhead Power Transmission Lines

Within the disturbed area, both overhead and underground power lines will be utilized. Overhead power lines will be run where underground power lines are not feasible. Vertical power poles (see #10 above) support the overhead lines to provide adequate and safe clearances below the power transmission lines. The overhead power transmission lines have been spaced to protect raptors. As-built drawings will be provided upon completion of the long-term surface facilities.

Overhead power lines will be remain through the life of the mine, and will be removed upon final reclamation.

13) Buried Power Transmission Lines

Within the disturbed area both overhead and buried power lines will be utilized. Buried power transmission lines will be run where feasible. All buried power transmission lines will be run in conduits. As-built drawings will be provided upon completion of the long-term surface facilities. Long-term underground power lines will remain throughout the life of the mine. Upon final reclamation, the long-term underground power transmission lines will be abandoned and left in place. To protect the underground high voltage cable from damage caused by equipment on the main access road, an 8'x20' steel sled has been buried on top of the cable.

28) Electrical Grounding Field

The electrical grounding field is composed of a grounding grid and rods buried below the soil. The electrical grounding field has been designed and constructed to meet MSHA requirements and regulations. It is used to ground the Mine Substation (see above). The location of the electrical grounding field is shown on Plate 5-2. The electrical grounding field will remain throughout the life of the mine, and will be removed during final reclamation.

37) Non-Potable Water Storage Tanks

Three non-potable water storage tanks are used to store water for mine-related purposes including dust suppression on roadways and other points as required by the approved Air Quality Order. The location of the non-potable water storage tanks is shown on Plate 5-2. The non-potable water storage tanks will remain throughout the life of the mine, and will be removed upon final reclamation.

40) Concrete Electrical Junction Box

The location of the concrete electrical junction box is shown on Plate 5-2. The concrete electrical junction box is a buried 6' by 6' by 6' concrete box with 6" thick walls, top and floor. A steel manhole allows access to the interior of the box. Within the junction box, high-voltage connections are made that allow power to be transferred from the Mine Substation to the overhead power lines. The concrete electrical junction box will remain throughout the life of the mine, and will be removed upon final reclamation.

41) Temporary Concrete Septic Tank

The temporary concrete septic tank facilitates the existing employees working on rotating shifts. The tanks are used in conjunction with the tanks that are a part of the bath house trailer (see #1 above) and other temporary office trailers (see #2

above). The tanks will be pumped out regularly. Multiple tanks are currently used. The locations of these tanks are shown on Plate 5-2. The temporary concrete septic tanks will be removed upon the completion of the long-term office areas and long-term bath house facilities.

MINE FACILITIES

14) Rock Dust Silo

The Rock Dust Silo is a tower silo used to store bulk rock dust for use within the mine. Rock dust is used to reduce the combustible fraction of coal dust in the air within the mine. The silo is constructed of a steel container supported by a steel frame on a concrete foundation with a 6" thick concrete pad and apron. The rock dust silo will remain throughout the life of the mine, and will be removed during final reclamation.

16) Temporary Underground Reclaim Room

The temporary underground reclaim rooms form a portion of the temporary coal handling facilities for the mine. The reclaim rooms are buried concrete and steel structures, measuring approximately 20' by 17' by 17' high. The floor, roof, and all walls, except one (1) wall, are constructed of steel
reinforced concrete. The remaining wall is constructed of plate steel and steel angles, with an opening for a tubed conveyor structure. The roof of the structure has an opening and gate that allows coal to fall from the bottom of the stockpile above onto a conveyor belt for transportation to either the Crusher Building or Loadout Structure. Two (2) temporary underground reclaim rooms are currently in use. These structures are shown on Plate 5-2. At the completion of the long-term coal handline facilities' construction, the rooms will be filled with rocks and other backfill material, then left in-place after final reclamation.

17) Temporary Concrete Retaining Walls

The temporary concrete retaining walls form a portion of the temporary coal handling facilities for the mine. The walls are constructed of steel reinforced concrete, and provide support for conveyor assemblies emanating from the temporary underground reclaim rooms (see #16 above), and prevent coal stockpiles from encroaching into unwanted areas. Two (2) temporary concrete retaining walls are currently in use. Steel wide-flange posts will be embedded into the concrete wall, extending up from the retaining walls adjoining the concrete dozer trap (see #25 below) in the event that more coal storage capacity is required above the dozer trap. In this event, steel plates will be welded to the steel posts to extend the height of the retaining wall in this area. These structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary concrete retaining walls will be razed.

18) Temporary Loadout Conveyors (48")

The temporary loadout conveyors are a portion of the temporary coal handling facilities for the mine. The temporary loadout conveyors move crushed coal from the temporary underground reclaim room (see #16 above) and concrete dozer trap (see #25 below) below the crushed coal storage pile to the top of the temporary loadout structures (see #20 below) in order to fill coal haulage trucks. Two (2) loadout conveyors (#1 and #2) will be utilized. The conveyors will transport coal to the Temporary Loadout #1 and #2 respectively. The conveyor structures are steel frameworks running 48" conveyor belts. A large portion of conveyor #1 is contained within a 9' diameter steel plate tube that extends underground to the temporary underground reclaim room (see #16 above). Conveyor #2 extends from the temporary concrete dozer trap (see #25 below). The temporary loadout conveyors are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout conveyors will be removed.

19) Temporary Loadout MCC Building

The temporary loadout MCC building is a portion of the temporary coal handling facilities for the mine. The building is the Motor Control Center (MCC) for the temporary loadout conveyor #1 (see #18 above). The structure is a steel plate building measuring approximately 6' by 16' by 8' tall. The electrical control for the conveyor motor and other electrical components for the temporary loadout assembly #1 are housed within the MCC building. The temporary loadout MCC building is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout MCC building will be removed.

20) Temporary Loadout Structures

The temporary loadout structures are a portion of the temporary coal handling facilities for the mine. Two (2) temporary loadout structures will be utilized (#1 and #2). The loadout structures are wide flange steel-framed structures on concrete foundation systems, with 6" thick concrete pads and aprons. The MCC (similar to #19 above) for conveyor #2 (see #18 above) is located atop temporary loadout #2. The tops of the structures also support the motors that drive the respective temporary loadout conveyors #1 and #2 (see #18 above). Coal is transferred, via the temporary loadout conveyors, from the crushed coal stockpile to the top of the loadout structures, where it falls through a spreader assembly into coal haulage trucks below for delivery off-site. The temporary loadout structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout structures will be removed.

21) Temporary Crusher Conveyor

The temporary crusher conveyor is a portion of the temporary coal handling facilities for the mine. The temporary crusher conveyor conveys coal from the temporary underground reclaim room (see #16 above) below the ROM coal stockpile to the temporary crusher / screen building (see #22 above) for sorting and crushing. The conveyor structure is a steel framework running a 48" conveyor belt. A portion of the conveyor is contained within a 9' diameter steel plate tube that extends underground to the temporary underground reclaim room (see #16 above). The temporary crusher conveyor is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crusher conveyor will be removed.

23) Temporary Crushed Coal Conveyor (48")

The temporary crushed coal conveyor is a portion of the temporary coal handling facilities for the mine. The temporary crushed coal conveyor conveys coal from the temporary crusher / screen building (see #22 above) that has been sorted and crushed on the Upper Pad to the crushed coal stockpile on the Middle Pad. The conveyor structure is a steel framework, supported by steel bents on concrete foundations, running a 48" conveyor belt. The temporary crushed coal conveyor is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crushed coal conveyor will be removed.

24) Temporary Crusher MCC Building

The temporary crusher MCC building is a portion of the temporary coal handling facilities for the mine. The building is the Motor Control Center (MCC) for the temporary crusher / screen building (see #22 above). The structure is a steel plate building measuring approximately 6' by 16' by 8' tall. The electrical control for the conveyor motors and other electrical components for the temporary crusher / screen building are housed within the MCC building. The temporary crusher MCC building is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crusher MCC building will be removed.

25) Temporary Concrete Dozer Trap

The temporary concrete dozer trap is a portion of the temporary coal handling facilities for the mine. The structure will be composed of concrete walls with a steel roof structure. The wall facing the loadouts (north wall) will be open for the Loadout Conveyor #2 and for access to the equipment housed in the dozer trap. The roof of the structure has an opening and gate that allows coal to fall from the bottom of the stockpile above onto the

temporary loadout conveyor #2 for transport Temporary Loadout #2. These structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary concrete dozer trap will be removed.

27) Temporary Concrete Equipment Pad

The temporary concrete equipment pad is a portion of the temporary coal handling facilities for the mine. The pad is a 12" thick, steel reinforced concrete slab. The drive motor and take-up equipment for the temporary crushed coal conveyor (see #21 above) rest upon this concrete pad. The concrete equipment pad is shown on Plate 5-2. The concrete equipment pad will remain until final reclamation, at which point it will be buried with other concrete materials as described in the Reclamation Plan.

30) Existing ROM Coal Conveyor from Underground (60")

The ROM (Run of Mine) coal conveyor from underground is a part of the temporary AND long-term coal handling facilities for the mine. The ROM coal conveyor from underground ties into the coal conveyor system within the underground mine workings to convey mined coal from the working face to the surface. The surface portion of the ROM coal conveyor measures approximately 300' long. The assembly is a steel framework, supported by steel bents on concrete foundations, running a 60" conveyor belt. The ROM coal conveyor from underground is shown on Plate 5-2. The existing ROM coal conveyor from underground will remain through the life of the mine. The alignment and elevation of the conveyor structure are such that when the long-term coal handling system is constructed, the existing ROM coal conveyor structure will be extended to the future ROM coal stacking tube. The entire assembly (existing and future) will be removed upon final reclamation.

31) Steel Portal Canopy Structure

A steel portal canopy structure is constructed at each portal of the mine. The canopy consists of steel wide flange posts and beams, and sheathed with steel plate. The canopy structure protects the portals (openings) to the underground workings. The canopies are constructed to meet MSHA regulations. Multiple steel portal canopy structures are utilized for the mine. The locations of the steel portal canopies are shown on Plates 5-2 and 5-2a, and in Appendix 5-9. The steel portal canopy structures will each remain throughout the life of the mine, or until its respective portal is no longer necessary and is sealed and reclaimed; whichever comes first. All remaining steel portal canopy structures will be removed during final reclamation.

32) Concrete Conveyor Bay at Belt Portal

The concrete conveyor bay at the belt portal is a portion of the temporary AND long-term coal handling facilities for the mine. The bay was originally used to house the belt drive for the original ROM conveyor structure, which has since been removed. The concrete conveyor bay now cradles and

supports the westernmost end of the ROM coal conveyor from underground (see #30 above) at the surface. The concrete conveyor bay is shown on Plate 5-2. The concrete conveyor bay will remain in place for the life of the mine, and will be removed upon final reclamation.

34) Mine MCC Building / Electrical Tower

The Mine MCC (Motor Control Center) building is the main hub for electrical power running from the surface to the underground mine workings. Nearly all power to the underground mine equipment runs through this 21' by 12' by 11.5' tall, steel plate building. The Mine MCC building shares a concrete foundation with an electrical tower that is approximately 45.5' tall, and constructed of 10"x10" tube steel. The electrical tower receives overhead power lines extending from the Mine Substation (see above). Some power lines extend to the Main Mine Ventilation Fan (see #36 below), but most power runs to a transformer at the base of the tower, then into the Mine MCC Building for distribution to the underground mine workings. The Mine MCC Building, Electrical Tower and transformer all share a common poured concrete foundation. The Mine MCC Building / Electrical Tower assembly is shown on Plate 5-2. The Mine MCC Building / Electrical Tower will remain through the life of the mine, and the entire assembly and foundation will be removed upon final reclamation.

35) Backup Ventilation Fans

The original ventilation fans for the mine remain in-place on a concrete foundation. These fans are attached to Portal #0. When the main mine ventilation fan (see #36 below) came online, the original ventilation fans became the backup ventilation fans. The backup ventilation fans are 250 horsepower fans that will blow fresh air into the mine's underground workings in the event that the main mine ventilation fan (see #36 below) fails. The backup ventilation fans are shown on Plate 5-2. The backup ventilation fans and their respective concrete foundation will remain in-place through the life of the mine, and will be removed at final reclamation.

36) Main Mine Ventilation Fan / Electrical Tower

The main mine ventilation fan is a 1,500 horsepower blowing fan, located on the ledge that is the exposed top of the Sunnyside Sandstone, at the North Breakout of the underground workings. The fan's purpose is to blow fresh

air into the underground mine workings for mine personnel throughout the mine, and to ventilate all open areas within the mine. The fan blows into Portal #2 of the North Breakout. The main mine ventilation fan rests on a poured concrete foundation that it shares with a 35' tall electrical tower, similar to the electrical tower at the Mine MCC Building (see #34 above). Overhead power transmission lines (see #12 above) extend from the Mine MCC Building/Electrical tower (see #34 above) to provide power for the main mine ventilation fan. The main mine ventilation fan and associated concrete pad and electrical tower have been constructed to meet MSHA regulations and requirements. The location of the Main Mine Ventilation Fan is shown on Plate 5-2. The fan, electrical tower and concrete foundation will remain throughout the life of the mine, and will be removed upon final reclamation.

39) Chain Link Fencing

Six foot high chain-link fencing has been, and will be installed as shown on Plate 5-2. The fencing will be constructed to protect the public and wildlife from the Mine Substation (see above) and along sections of County Road RS-2477, along the western edge of the permit boundary. The fencing will remain throughout the life of the mine, and will be removed upon final reclamation.

43) Temporary Conveyor Counterweight Structures

The temporary conveyor counterweight structures add weight to conveyor belts to keep them taut during operation. The Temporary Loadout Conveyors (see #18 above) and the Temporary Crusher Conveyor (see #21 above) each have a temporary conveyor counterweight structure. The structure is constructed of a steel framework that guides the counterweight for the respective conveyor. The structure rests on a 12" thick, steel reinforced concrete slab. The locations of the temporary conveyor counterweight structures are shown on Plate 5-2. Upon the completion of the long-term coal handling facilities' construction, the temporary conveyor counterweight structures will be removed.

44) Jersey Barrier Guard Rails

A Jersey Barrier is a prefabricated, modular concrete barrier used to guide vehicular traffic and minimize damage in cases of incidental contact. When placed end-to-end, these barriers prevent vehicles from running off designated roadways. Jersey barrier guard rails are installed according to MSHA requirements. The locations of the jersey barrier guard rails are shown on Plate 5-2. The jersey barrier guard rails will be utilized throughout the life of the mine and will be removed upon final reclamation.

45) Concrete Trash Chute

The concrete trash chute is used for deposition and storage of trash until the refuse can be hauled to a nearby State-approved solid waste disposal area (landfill). The trash chute is constructed of concrete walls and floor; open at one end to allow for vehicles to dump and remove trash as necessary. Chain link fencing will be stretched horizontally across a portion of the top of the chute to prevent the wind from blowing lighter pieces of trash out of the enclosure. The location of the Concrete Trash Chute is shown on Plate 5-2. The concrete trash chute will remain through the life of the mine, and will be removed upon final reclamation.

46) Gantry Lift Assembly

The Gantry Lift Assembly is a stationary assembly consisting of two (2) lifting crane structures, working together to lift heavy equipment and machinery from a trailer that cannot be lifted by other equipment (i.e. a forklift or other mobile machinery). Each of the lifting crane structures is rated for forty (40) tons. A set of two poured, steel reinforced concrete footing and foundations will support the legs of both crane structures. Each footing and foundation assembly will extend approximately forty (40) feet in length. The location of the Gantry Lift Assembly is shown on Plate 5-2. The Gantry Lift Assembly will remain through the life of the mine, and will be removed upon final reclamation.

SUPPORT FACILITIES

Mine Facilities Access Road / Truck Loadout Road

The mine facility road, shown on Plate 5-2, begins at the edge of County Road 164 (Lila Canyon Road), and allows for access to the Lower Pad and the temporary loadout structure (see #20 above). The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities on the Lower Pad. Coal haul trucks use this road to access the temporary truck loadout (see #20 above) on the Middle Pad. All supplies will be hauled on a short portion of this road from the Lower Pad and Storage Area Pad to the slope access road. The road is paved with crushed granite and is regularly watered with a sprinkler system in order to minimize dust and provide a good surface for heavy truck traffic, as well as facility access. The facility access road is approximately 30' wide to provide for two-lane traffic, and has the appropriate drainage controls to insure long term life and low maintenance. The road has been constructed according to the appropriate R645-534 and R645-527 regulations. The road will remain throughout the life of the mine, and will be removed upon final reclamation.

Rock Slopes

Access to the underground workings of the Lila Canyon Mine is provided through two rock slopes driven from the top of the Mancos shale, sloping up to the intersection of the coal seam. One portal provides access for men, equipment and material to the mine. The second access slope contains the underground portion of run-of-mine belt line that attaches to the existing ROM Coal Conveyor from Underground at the surface (see #30 above) that transports mined coal to the run of mine stock pile at the Upper Pad. The two rock slopes incline upward at approximately 12%, from a starting elevation of approximately 6150'. The intersection of the coal seam and the rock slope takes place at approximately the 6,300 feet elevation. The lengths of the slopes were minimized by taking advantage of the coal seam dip which is approximately 12% to the east. The rock material removed from the slopes has been used as fill material for the pads of the surface facilities. The rock slope material / underground development waste contains mostly shale, sandstone and mudstone. Small traces of coal may be found, but the amount is insignificant. There are no known coal seams or significant rider seams found below the Sunnyside Seam in the Lila Canyon Portal Area. The rock slope and rock slope material fill locations are shown on Plate 5-2. The rock slopes will be sealed at the portals according to MSHA regulations at the completion of mining operations, and reclaimed per the Reclamation Plan.

Sediment Ponds

The sediment ponds have been designed to provide for adequate sediment protection for the project area. Surface water running off disturbed areas will be routed into the sediment ponds. The sediment ponds have been designed according to the appropriate R645 regulations, and the designs can be found in Appendix 7-4, and Plates 7-6a and 7-6b. Because the sediment ponds do not meet the requirement of 30 CFR 77.216(a), an MSHA number for the sediment ponds is not required. Sediment Pond #1 is located on the southwest corner of the property. Sediment Pond #2 is located on the northwest corner of the property. Both ponds are shown on Plate 5-2. Please refer to Chapter 7 for detailed information on drainage reporting to both ponds. Both sediment ponds will remain through the life of the mine, and will be removed during final reclamation according to the approved reclamation plan.

Slope Access Road / Portal Access Road

The slope access road connects to the facility access road near the northeast corner of the Middle Pad, and follows an alignment that takes into consideration grade and direct access. The slope access road is used to provide access to the rock slopes (see above), which in-turn provides access to the underground workings. The slope access road is used as access for all men, material and equipment needed within the mine. Since the slope

access road provides for frequent access for men, equipment and materials for a period of six months or longer, the slope access road is classified as a primary road and will be paved. The slope access road has been designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2. The slope access road will remain throughout the life of the mine, and will be removed during final reclamation. There are 3 convex traffic mirrors mounted on metal poles located along this road, to assist with visibility around corners.

Storage Pad

A supply and materials storage pad is constructed directly south of the Mine Substation (see above), but within the existing disturbed boundary line as shown on Plate 5-2. The pad is constructed similarly to the existing Lower, Middle and Upper Pads (see Chapter 2, Section 232.500), with a gravel covering. The storage pad is needed so large trucks delivering and/or collecting materials and supplies will not congest the parking and supply areas already in-place on the Lower Pad, or interfere with the Mine Facilities Access Road / Truck Loadout Road (see above) and trucks preparing to load coal or loaded trucks hauling coal from the mine site. Moving the delivery trucks to the storage pad will reduce vehicle congestion, and decrease the possibility of accidents resulting from said congestion. The storage pad will be utilized throughout the life of the mine, and will be reclaimed per the Reclamation Plan. There is a 3'x10' steel foot bridge connecting this storage pad to the undisturbed area between it and the substation. This is for foot traffic to access the rain monitoring gauge that is located in that area. The rain gauge is a single pole holding a rain collection data devise.

Storage Pad Access Road

The storage pad access road will extend from the Middle Pad to the Storage Pad (see above), which lies just south the Mine Substation (see above). The storage pad access road will be used to provide access between the two pads for mine personnel, equipment and supplies. Since the storage pad access road will provide access for men, equipment and materials for a period of six months or longer, the new storage pad access road is classified as a primary road, and will be paved. The new storage pad access road has been designed and will be constructed and maintained according to appropriate R645 regulations. The storage pad access road is shown on Plate 5-2. The storage pad access road will remain throughout the life of the mine, and will be removed upon final reclamation.

Storage Pad Service Road

The storage pad service road, shown on Plate 5-2, will begin at the edge of County Road 164 (Lila Canyon Road), and will allow for access to the storage pad (see above) directly south of the Mine Substation (see above). The first approximately 350 feet of the storage pad service road from County Road 164 (Lila Canyon Road) will be a reworking of the existing County Road RS-2477. The storage pad service road will then continue to the storage pad

(see above). The storage pad service road will be approximately 30 feet wide and provide access for trucks to deliver and/or collect supplies, materials or equipment related to mine activities, without

increasing congestion on the mine facilities access road / truck loadout road (see above). Since the storage pad service road will provide access for men, equipment and materials for a period of six months or longer, the storage pad service road is classified as a primary road, and will be paved. The storage pad service road has been designed and will be constructed and maintained according to appropriate R645 regulations. The storage pad service road is shown on Plate 5-2. The storage pad service road will be removed during the course of construction of the long-term coal handling facilities. The portion of the storage pad road that lies along the existing County Road RS-2477 may remain or be reclaimed. The BLM and Emery County will be consulted when appropriate, and the Division will be advised as to the course of action for the roadway (remain or be reclaimed). Access to the storage pad (see above) will be rerouted through the new truck loadout road when the long-term truck loadout road is completed. When this happens, the existing truck loop will become the new truck loading/unloading area for the future warehouse on the Upper Pad.

Topsoil Pile

The topsoil pile has been located on the southwest end of the surface facilities. The pile has been designed to contain adequate topsoil for redistribution according to the reclamation plan found in Chapter 5. The proposed location provides for good protection from wind contamination, as well as protection from mine related activities. The location of the topsoil pile is shown on Plate 5-2. The topsoil will be redistributed across the disturbed area according to the mine reclamation plan.

6) Temporary Concrete Walkway

Temporary concrete walkways have been constructed at temporary buildings, the temporary bath house (see #1 above) and temporary office trailers (see #2 above). The walkways are generally 6' wide by 4" thick. The locations of the temporary concrete walkways are shown on Plate 5-2. The temporary concrete walkways will be removed as their respective temporary buildings are removed.

15) Temporary Fuel Storage Tanks

The temporary locations of the fuel storage tanks are on the Middle Pad as shown on Plate 5-2. The tanks are bulk fuel storage tanks containing gasoline or diesel fuel for mine vehicles. The tanks are supported by steel legs above integral steel secondary containment basins. Upon completion of the long-term surface facilities' construction, the fuel tanks will be relocated to their long-term location on the Upper Pad. The fuel tanks will remain in their long-term locations for the life of the

mine, and will be removed upon final reclamation.

29) Sediment Pond Spillway Structure

As shown on Plate 5-2, and in Chapter 7, Sediment Ponds #1 and #2 each have a spillway structure constructed of corrugated metal pipe to allow for surplus water to exit the respective pond. Each spillway is equipped with an oil skimmer structure. Pond #1 has a 3'x30' steel catwalk leading out to the skimmer structures. See Plates 7-6a and 7-6b for detailed drawings. The sediment pond spillway structures will remain throughout the life of the mine and will be removed during final reclamation.

38) Powder and Cap Magazines

Powder and cap magazines will be mobile, temporary, and supplied by the explosive distributer. Upon reclamation, the powder and cap magazines will be returned to the distributer.

42) Temporary Loadout Light Board

The temporary loadout light board consists of a free standing metal post pedestal with traffic control lights for the temporary loadout structure (see #20 above). The pedestal is mounted upon a steel reinforced concrete pad. The lights provide information to coal haul truck drivers as coal is loaded into their trucks at the temporary loadout structure. The temporary loadout light board location is shown on Plate 5-2. Upon the completion of the long-term coal handling facilities' construction, the temporary light board and concrete support pad will be removed.

Long-Term Underground Pipes

The locations of the long-term underground pipes have yet to be determined. Once detailed engineering design is completed, the underground pipes will be added to Plate 5-2, or other appropriate plates as required. Long-term underground pipes will be abandoned and left in place upon final reclamation.

Culverts

All new culverts are considered temporary and will be removed at final reclamation, unless specifically noted to remain within other sections of this MRP. All new culverts will be installed and maintained to meet the requirements of R645-301-742.100, R645-301-742.300, and Appendix 7-4 of this MRP.

A series of temporary culverts (UC-5, UC-6 and UC-7) will be installed at the southeastern corner of the disturbed area for the surface facilities (see Plates 7-2 and 7-5). These culverts will generally align with, and be installed within, the existing drainage channels. See Plates 5-7E-1 through 5-7E-7 for installation, new disturbance, and reclamation plans and details. These culverts are shown and noted on Plates 7-2 and 7-5.

After grubbing of the general disturbance area shown on Plates 2-3, 5-2, and

5-7e-1 is complete, a geotextile fabric liner will be placed within the existing drainage channels to cover and protect the in-situ soils. Fill material will then be placed over the geotextile fabric liner to the required elevations to support the culverts. These culverts will be corrugated metal pipe (CMP). Appropriate inlet and outlet structures will be attached at their respective locations on the culvert assemblies. The culverts will discharge onto an engineered discharge structure (apron) per Appendix 7-4. These culverts will be covered with a 24" minimum of fill material. The installation of the geotextile fabric liner, the culverts, and fill material is detailed on Plate 5-7e-1. Profiles, sections and cut/fill tabulations are found on Plates 5-7e-2 through 5-7e-6. Fill material for these culverts will be harvested from the north slope of Sediment Pond #1. See Plate 5-2 for the borrow location for the fill material.

Topsoil will be salvaged on either side of the culvert alignment, beyond the geotextile fabric and fill material covering the in-situ soils. The depth of topsoil salvage is shown on Plate 2-3 and Plate 5-7e-1. Several areas within the projected topsoil salvage area are very steep and include rock outcroppings. Within these steep and rock outcrop areas, topsoil will not be salvaged, as these areas would be unsafe or impractical for construction activities. Large boulders removed during topsoil salvage operations will be store adjacent to the culvert disturbance area, and will be returned to their approximate locations during final reclamation.

Final reclamation of these culverts and the surrounding disturbed area will generally follow the reclamation plan found in Appendix 5-8, except for the in-situ soils that will be below the geotextile fabric liner and fill material. Once exposed, these soils below the liner will be tested to determine if nutrients or other additives are needed to insure the viability of the in-situ topsoils. Granular PAM-12, or best technology currently available at the time of reclamation, will be added to the in-situ soils to relieve compaction of the soil, and open channels within the soil for water and air penetration. A series of sediment logs will be installed within the geotextile fabric liner area, at ten foot maximum vertical intervals, to prevent sediment loss. After the area has been seeded per the approved seed mix, a bonded fiber matrix tackifier will be applied over the entire geotextile fabric liner area, including the sediment logs, to further prevent sediment loss after final reclamation. The final reclamation plan for these culverts and surrounding area is detailed on Plate 5-7E-7.

A complete list and design for the culverts can be found in Appendix 7-4, Tables 9 and 10; and are shown on Plate 7-5.

Roadways

As per the approved Air Quality Order and R645-201-534.300, all primary roads will be paved or surfaced with rock, crushed gravel, asphalt or other approved

material. Roads and pad areas used by mobile equipment will be treated with water or other dust suppressant. Open stockpiles will be watered as conditions warrant.

521. Included in this section are maps, cross sections, narratives, descriptions and calculations used to satisfy the relevant requirements. This section describes and identifies the lands subject to coal mining and reclamation operations covering the estimated life of the project.

521.100 This application includes the cross sections, maps and plans needed to present the relevant information required by the Division. This information includes the following:

521.110. Plate 5-1 Shows area previously mined and approximate dates of mining.

521.111 Plates 5-1 and 2-2 show the location and extent of known workings of inactive, or abandoned underground mines. The surface portals or mine openings to the surface are shown. Plates 5-1 and 2-2 have been prepared and certified by or under the direction of a registered professional engineer.

Doelling lists several coal mines and mining activity within or adjacent to the permit area. Doelling lists the Calkins prospect, the Lila Canyon prospect, and the Prentiss prospect. In addition, Doelling lists several coal mines: Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines. The research has shown that the Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines were engulfed by the Book Cliffs mine. The Lila Canyon prospect refers to the old Lila Canyon mine fan portals used to ventilate the Geneva (Horse Canyon) mine. The Calkins prospect is believed to have been engulfed by the Geneva mine.

An outcrop fire has been detected in an area north of the exiting permit area “A.” The fire is off the permit area and located in an area that has been sealed from the old horse canyon works. The outcrop fire is not anticipated to cause any problems with mining at the Lila Canyon Mine.

521.112 No surface mined areas are found within the permit area. Therefore, this section does not apply.

521.120 Three existing structures, a 48" and a 60" CMP culvert located near the new proposed sediment pond, and the Little Park Road can be found at the Lila Canyon Mine. The existing culverts are shown on

plate 5-1A and the road on Plate 5-1. Existing Horse Canyon facilities are discussed in part "A" of this plan, and used for historical purposes only.

521.121 There are no buildings within 1000 feet of the proposed permit area, except those used as a part of the Lila Canyon mining operation.

521.122 There are no subsurface man-made features, other than the culverts discussed in 521.200, within, passing through, or passing over the proposed permit area.

521.123 Plate 4-1, as well as others, shows the existing County Road 126 which is located partly within 100 feet of the proposed permit area. In addition, the Little Park road is located above the surface facilities within the permit area. The Little Park Road is also shown on plate 4-1

521.124 There are no known existing areas of spoil, waste, coal development waste, or non-coal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities, except those used as part of the mining operation.

521.125 There are no existing sedimentation ponds, permanent water impoundment, coal processing waste banks or coal processing waste dams near or within the permit area.

521.130 Landowner and right of entry maps are included in the permit application. These maps and cross sections show the following:

521.131 Plate 4-1 shows the surface ownership and Plate 5-4 shows the coal ownership of land included in or contiguous to the permit area.

521.132 The applicant has the legal right to enter and begin coal mining and reclamation operations on all areas shown within the permit area. The permit area is shown on Plates 5-3 and 5-4 as well as others.

521.133 Coal mining or reclamation operations are planned within 100 feet of a public road. There are no plans to relocate public roads.

521.133.1 Emery County has given permission to conduct coal mining or reclamation operations within 100 feet of the county

road. (See Appendix 1-4)

521.133.2 The current permit does not propose any relocation of public roads. Therefore, this section is not applicable.

521.140 Mine maps and permit area maps and/or cross-sections will clearly indicate the following:

521.141 Plate 5-1 shows the permit boundary and Plate 5-2 shows the disturbed area boundary. Additional subareas that might require additional permits are addressed in Section 112.800 and 4-1B.

521.142 The underground workings are shown on Plate 5-5.

521.143 The proposed disposal site for placing the slope rock is shown on Plate 5-2 as well as other appropriate plates.

521.150 Plates 6-2, 6-3, and 6-4, show surface contours that represent the existing land surface configuration of the proposed permit area.

521.151 The Plates show the surface contours for all areas to be disturbed as well as over the total permit area. The Plates showing the surface contours have been prepared by or under the supervision of a registered engineer.

521.152 No previously mined areas are included within Part "B." Therefore, this section does not apply.

521.160 The maps, plates, and cross sections associated with this chapter clearly show:

521.161 Proposed buildings, utility corridors, and facilities are shown on Plate 5-2, as well as others.

521.162 The area of land affected according to the

sequence of mining and reclamation is shown on the appropriate plates.

521.163 Land for which a performance bond will be posted is shown on the appropriate plate. Plate 5-2 as well as others, show the area for which the performance bond will be posted. All disturbed areas within the permit boundary have been bonded.

521.164 Existing coal storage and loading areas are shown on Plates 5-2 and certified as required. Future coal storage and loading areas are certified as required. Additional information can be found in Appendix 5-4.

521.165 Topsoil and waste piles are shown on Plate 5-2, as well as others.

521.166 The waste disposal areas are shown for non-coal waste and underground mine waste on Plate 5-2.

521.167 No explosives are expected to be stored on-site. However, if explosives are stored, they will be stored as discussed in Section 520. on Plate 5-2.

521.168 Since Lila Canyon mine is an underground operation, this paragraph is not applicable.

521.169 The refuse pile is shown on Plate 5-2 and discussed in Appendix 5-7.

521.170 Transportation facility maps describing roads and conveyors maintained within the permit are shown with descriptions of roads, embankments, culverts,

and drainage structures are presented in section 520 and are shown on Plates 5-2, 7-2, and 7-5.

521.180 Support facilities are described in section 520 and are shown on Plate 5-2. Plate 5-2 is the official

disturbed area boundary map.

521.190 Other relevant information required by the Division will be addressed.

521.200 Signs and markers will:

521.210 Signs and markers will be posted maintained, and removed by the person who conducts the coal mining and reclamation operations.

521.220 Signs and markers will be of uniform design that can be easily seen and read and be made of durable material and conform to local laws and regulations.

521.230 Signs and marker will be maintained during all activities to which they pertain.

521.240 Mine and Permit Identification Signs.

521.241 Mine and permit identification signs will be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas.

521.242 Since Lila Canyon Mine is an underground operation, this section is not applicable.

521.243 Mine and permit identification signs, where required, will show the name, business address, and telephone number of the permittee and the identification number of the permanent program permit authorizing coal mining and reclamation operations.

521.244 Mine and permit identification signs will be retained and maintained until after the release of all bonds for the permit area.

521.250 Perimeter Markers

521.251 The perimeter of all areas affected by

surface operations or facilities before beginning mining activities will be clearly marked with perimeter markers.

521.252 Since Lila Canyon Mine is an underground operation, this section is not applicable.

521.260 Buffer Zone Markers

521.261 Signs will be erected to mark buffer zones as required and will be clearly marked to prevent disturbance by surface operations and facilities.

521.262 Since Lila Canyon Mine is an underground operation, this section is not applicable.

521.270 Topsoil Markers will be erected to mark where topsoil or other vegetation-supporting material is physically segregated and stockpiled.

522. Coal Recovery

Additional Details can be found in the R2P2 on file at the BLM Office.

Effective barrier and pillar designs are essential for safe and productive underground mining. Barrier pillars will be sized according to accepted engineering practices. One or more of the following methods may be used to properly size barrier pillars: Dunn's Rule, the Old English Barrier Pillar Law, Pennsylvania Mine Inspector's Formula, Ash and Eaton Impoundment Formula, Pressure Arch Method, British Coal Rule of Thumb, North American Method, Holland Rule of Thumb, or Holland Convergent Method.

Regardless of the methods or care taken to properly size barrier pillars, the true effectiveness on any design can only be determined by conducting full-scale in-mine performance evaluations. Mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

Barrier pillars will be utilized to isolate the abandoned Horse Canyon Mine from the new Lila Canyon Mine. Barrier pillars will also be used to simplify ventilation, to provide independent escape routes, and to

possibly retain large quantities of mine water. Barrier pillars will be employed along the outcrop in order to maintain ventilation courses.

A barrier pillar, where no second mining will be allowed within the barrier, will be used to protect the escarpments. The width of the escarpment barrier will be determined by implementing a 21.5^{o} angle of draw projected, downward from the surface to the coal seam. Development mining, or first mining, will be allowed within the escarpment barrier.

For longwall mining applications, the abutment loading is of prime importance. Initial longwall pillars will be designed using the ALPS method. Again, mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

Mine pillars will be sized taking into consideration the coal strength, depth of cover, width and height of pillars, using one or more of the following methodologies: Obert-Duvall, Holand-Graddy, Holland, Salamon-Munro, or Bieniawski. Again, mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

523. Mining Methods:

Mining will begin in Section 15, T16S, R14E, in the Sunnyside seam. Development of the Sunnyside seam will be in a down dip direction toward the east. The seam will be accessed by two 1,200 foot slopes driven up at 12% from the base of the cliffs.

Production during the first year is estimated to be 200,000 tons. The second through the fifth year production should be between 1,000,000 and 1,500,000 using continuous mining methods. If and when tonnage demand increases to justify longwall mining, production could peak as high as 4,500,000 tons a year and continue at that level for the life of the mine.

Mine production will begin with the slope construction. Once the coal is encountered, development will continue using continuous miners and various haulage types. Battery, cable, or continuous haulage may be used in conjunction with continuous miners in development. Continuous miners will account for all the production during the first two to five years. Mining will consist of driving mains, developing room and pillar panels and gate entries for future longwall mining.

The majority of the second mining will be performed using longwall equipment. However, in isolated areas room and pillar type of mining may be used in areas not suitable, or not permitted, for longwall mining. Longwall panels are sited approximately parallel lengthwise to the strike with a slight up dip orientation to provide drainage for the development faces. This practice will be applied to the continuous miner panels wherever possible. (See plate 5-5)

Roof control and ventilation plans will be submitted to MSHA and approved prior to any underground mining activities.

An air quality permit from the State Division of Air Quality has been obtained and will be modified as needed.

Ventilation of the mine will be by an exhaust and/or blowing type system. It has been estimated that 900,000 cfm will be required at full production. Intake air will be supplied by slopes and entries from the surface.

A water supply system will be installed. Potable water from an approved source will be hauled by truck and stored in a mine site storage tank located near the man and coal slope portals. Alternative sources for potable water are being considered. A treatment plant may be indicated. Process water will be hauled from the Price River or other approved source by truck and stored in another mine site storage tank. It is anticipated that once the old two entry development panel is encountered, adequate process water may be obtained from the old works. This process water will provide for dust control, water to the mine and fire suppression. Mine water will be used with the process water. See Appendix 7-3 (PHC) for water usage calculations.

Dust suppression will be accomplished by the use of sprays on all underground equipment as required. Sprays will also be used along sections of the conveyors and at transfer points.

No major de-watering concerns are anticipated at this property. The workings are expected to produce some water with more water being produced as the depth of mining increases. Part of this water will be used for dust suppression. The remainder will be collected in sumps and pumped to mined out sections of the mine or to the surface and treated when necessary.

Underground mining equipment to be used at Lila Canyon is typical of most room-and-pillar and longwall mines. A list of major equipment

which may be used underground is listed below. Additional equipment not on the list may be used as needed.

Continuous Miners
Roof Bolters
Battery Shuttle Cars
Electric Shuttle Cars
Diesel Ram Cars
Feeder Breakers
Continuous Haulage Units
Battery Scoops
Diesel Scoops
Diesel Service Vehicles
Diesel Material Haulers
Diesel
Belts and Terminal Groups
Battery and Diesel Man Trips
Longwall Shields
Longwall Pan-lines
Longwall Shears
Longwall Stage-loaders
Longwall Pumps
Various Water Pumps
Various Transformers and Switches
Rock Drills
Loaders

523.100 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine. Therefore, this section is not applicable.

523.200 No Surface Coal Mining and Reclamation Activities are proposed with 500 feet of an underground mine. Therefore, this section is not applicable.

523.210 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine. Therefore, this section is not applicable.

523.220 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine. Therefore, this section is not applicable.

524. Blasting and Explosives: Surface blasting activities incident to underground coal mining are planned for the Lila Canyon mine during construction of the access slopes only.

524.100 Steps have been taken to achieve compliance with the blaster certification program and are described in this permit application.

524.110 Surface blasting involving 5 lbs. of explosives or more will be done under the direction of a certified blaster.

524.120 Blasting certificates will be carried by the blasters or will be on file at the permit area during blasting operations.

524.130 The blaster and at least one other person will be present at the firing of a blast.

524.140 Persons responsible for blasting operations at a blasting site will be familiar with the blasting plan, if required, and site-specific performance standards and give on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

524.200 Since the planned blasting does not meet the requirements of 524.211 or 524.212, a blast design is not included in the permit application. If, in the future, blasting falls under section 524.200, then a plan will be submitted to Division for approval.

524.210 Since the planned blasting does not meet the requirements of 524.211 or 524.212, anticipated blast designs are not required.

524.300 Since planned blasting requires more than 5 lbs. of explosives, the preblasting survey is addressed where applicable in this permit application.

524.310 There are no dwellings or other structures located within one-half mile of the permit area owned by anyone but the operator. The operator will prepare the preblast survey if required. Notification procedures implied in this section are not applicable.

524.320 Since the operator is the only owner of structures and no dwelling exists within one-half mile of any part of the permit area, this section is not applicable.

524.330 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.340 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.350 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.400 The blast schedule is as follows:

524.410 Since there are no residents within one-half mile of the projected blasting site, this section does not apply.

524.420 All surface blasting will be conducted between sunrise and sunset, unless nighttime blasting is approved by the Division.

524.430 Since there are no residents within one-half mile of the projected blasting site, this section does not

apply.

524.440 Since there are no residents within one-half mile of the projected blasting site, a flexible blasting schedule is allowable. Surface blasting may take place anytime during daylight hours, unless approved differently by the Division.

524.450 Because of the remote location of the Lila Canyon Mine, over six miles from the nearest locality (Columbia), this section does not apply.

524.460 Since the town of Columbia is the nearest locality and is over six miles distance from the permit area, this section does not apply.

524.500 The blasting signs, warnings and access control are described below.

524.510 Blasting signs will meet the specifications of R645-301-521.200. The following will apply.

524.511 Signs reading “Blasting Area” will be conspicuously place at the point where any road provides access to the blasting area.

524.512 The signs posted at all entrances to the permit area from public, roads, or highways will be placed in a conspicuous location and will state “Warning! Explosives in Use,” and will clearly list and describe the meaning of the audible blast warning and all clear signals that are in use.

524.520 Audible warning and all-clear signals of different character or pattern will be given. Each person within the permit area will be trained in the meaning of the signals.

524.530 Access within the blasting area will be controlled until the operator has reasonably determined the following:

524.531 No unusual hazards, such as imminent slides or undetonated charges, exist; and

524.532 Access to and travel within the blasting area can be safely resumed.

524.600 Adverse blasting effects are described as follows:

524.610 Blasting will be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availably of surface or ground water outside the permit area.

524.620 Airblast Limits

524.621 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.622 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.630 Monitoring: Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.640 Ground Vibration: Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance form the permit area, this section does not apply.

524.650 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.660 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.670 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.680 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.690 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, sections 524.620 through 524.632 and 524.640 through 524.680 do not apply.

524.700 Records of blasting operations will be maintained at the mine site for at least three years, and will be available for inspection by the Division or the public.

524.710 Blasting records will include:

524.711 The name of the operator will be on the blasting record.

524.712 The location, date, and time of the blast will be recorded on the blasting record.

524.713 The name, signature, and certification number of the blaster will be recorded on the blasting record.

524.720 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, this section does not apply.

524.730 Weather conditions will be recorded on the blasting

record.

524.740 A record of the blast will include the following:

524.741 The type of material blasted will be recorded on the blasting records.

524.742 Sketches of the blast pattern including number of holes, spacing, burden, decks, and delay pattern will be recorded on the blasting record.

524.743 The diameter and depth of holes will be recorded on the blasting record.

524.744 The type of explosives used will be recorded on the blasting record.

524.745 The total weight of the explosives used per hole will be recorded on the blasting record.

524.746 The maximum weight of explosives detonated in an eight-millisecond period will be recorded on the blasting record.

524.747 Information on the initiation system will be recorded on the blasting record.

524.748 The type and length of the stemming will be recorded on the blasting record.

524.749 Mats or other protections used will be recorded on the blasting record.

524.750 Since all structures are either owned by the permittee and not leased to another person, or are located over six miles distance from the permit area, a record of seismographic and airblast information is not required.

524.760 Since a blasting schedule is not required, this section does not apply.

524.800 The operator will comply with the various appropriate State and Federal laws and regulations in the use of explosives.

525. Subsidence: The permittee will comply with the appropriate R645-301-525 requirements.

525.100 Subsidence Control Plan

525.110 Plate 5-3 shows the location of State appropriated water and Plate 5-3 (Confidential) shows the eagle nests that potentially could be diminished or interrupted by subsidence.

525.120 SUBSIDENCE POTENTIAL

A review of renewable resources in and adjacent to the permit area found resources consisting of ground water, grazing, timber, and recharge areas. Subsidence from underground coal mines has been believed to affect overlying forest and grazing resource lands in the following ways:

- Formation of surface fissures which intercept near surface soil moisture thus draining the water away from the root zone with deleterious effects.
- Alterations in ground slope and destabilization of critical slopes and cliffs.
- Modification of surface hydrology due to the general downward migration of surface water through vertical fractures.
- Modification of groundwater hydrology including connection of previously separated aquifers, reduction in flows of seeps and springs which rely upon tight aquitards for their flow, and changes in recharge mechanisms.

- Emissions of methane originating from the coal seam through open fissures to the surface or at least the base of the surficial soil which has been known to have deleterious effects on woody plants.

Because these renewable resources exist with and adjacent to the permit area, a subsidence control plan is required. This plan is presented in Section 525.400.

A great deal of baseline data is available from many mining settings to develop subsidence damage criteria for surface structures (Bhattacharya et al. 1984). The formation of cracks and fissures are the general effects of subsidence and can have minor deleterious effects on groundwater resources without any fissuring to the surface. In the arid areas of Utah, impacts to and modification of the groundwater regime can be disruption of flow from natural seeps and springs which rely on the permeability contrast of interbedded sandstones and shale for their flows. These water resources are generally near surface occurrences and are essentially surface waters and subject to the same limiting damage criteria as surface water bodies. Subsidence damage to surface water bodies has been studied by a number of workers including Dunrud (1976), Wardell and Partners (1976), and U.S. Bureau of Mines (1977). The result of the Wardell and Partners studies of subsidence effects in a number of countries indicates that the limiting strain for the onset of minor impacts to surface waters is approximately 5×10^{-3}. The SME Mining Engineering Handbook also suggests a limiting extension strain value of 5×10^{-3} for pasture, woodland, range or wildlife food and cover.

Table 10.6.19 in the Mining Engineers Handbook suggests that the minimum safe cover required for total extraction of the coal resources under surface waters is approximately 60 times the seam thickness for coal beds at least 6 feet thick or approximately 450 feet. In their review of the foregoing, Singh and Bhattacharya (1984) recommended that the same limiting safe strain values and cover thickness ratios be used for protecting groundwater resources and recharge areas over coal mines. Where extension strain is greater than this limiting value, it is likely that surface fissures and cracks may develop. As the strain value decreases below the limiting value, the potential for surface damage decreases.

Figure 1 in Appendix 7-3 shows a typical subsidence profile. As shown in Figure 1, the zones are: a caved zone that occurs in the six to 10 times the thickness of the coal seam, a fractured zone which occurs 10 to 30 times the thickness of the coal seam, and deformation zone which occurs 30 to 60 times the thickness of the coal seam, and finally, a soil zone which occurs on the ground surface. The cover thickness of 1,000 to over 2,000 feet, over most of the mine area is also much greater than the limiting thickness of 630 feet recommended by International Engineers Inc. (1979) (10.5' x 60).

The Lila Canyon mine will be a longwall operation. As projected, 15~~5~~9 longwall panels at various depths will be mined. The longwall panels are laid out with the gate roads running along the strike roughly north-south, which will result in the longwall shear cutting up and down the dip. The depth of cover over the longwall panels approaches but never gets less than 500 feet toward the southwest and increases to over ~~2500~~3000 feet in the northeast. Only ~~three~~two of the 13~~3~~9 planned longwall panels are completely under less than 1,000 feet of cover. ~~T~~ Two ot~~h~~e ~~remaining 10~~r longwall panels are partially under 1,000 ~~plus~~ feet of cover. Maximum subsidence is expected to be approximately 9.5 feet in the areas approaching 500 feet of cover and less than 3' in the deeper cover areas. Extension strain varies from 12.4 $x10^{-3}$ in the 500 foot cover areas to .9 x 10^{-3} in the 2,500 foot cover areas. Extension strain values of 5.0 x 10^{-3} and above occurs in areas of approximately 1000' of cover and less.

A typical longwall panel at the Lila Canyon Mine will have dimensions of approximately ~~950~~847 feet wide and up to 7,000 feet long and 2,000 feet deep. Using the methods described in the National Coal Board's *Subsidence Engineers' Handbook,* the S/m ratio for this geometry would be 0.38 where "S" is the maximum subsidence and "m" is the seam extraction thickness. For an average seam extraction thickness of 10.5 feet, the total subsidence would be 4.0 feet. However, as described above, the major impacts of this subsidence are due to extension strains and not total vertical subsidence. The prediction of average extension strain is accomplished with the use of the formula:

+E = 0.75 S/h where S=subsidence, and h=depth of cover

NOTE: The .75 factor is only an average. The

factor changes with various w/h ratios. Figure 15 found in NCB's Subsidence Engineers Handbook takes into account the w/h ratio.

The solution of this equation for the Lila Canyon Mine configuration discussed above produces a predicted, average extension strain of 1.5×10^{-3} which is less than the limiting strain of 5×10^{-3} for protecting surface waters, groundwater sources, pasture, woodland, range or wildlife food and cover. Thus, it is unlikely that the gradual compression expected over much of the subsidence area will have any deleterious effects on the overlying renewable surface resources.

The table below shows the expected subsidence amounts and expected extension strain for longwall panels at various mining depths. These calculations were done for a flat multiple seam mining. There are adjustments for single seam mining and for dipping seams. However, these adjustments are minor and are not expected to result in significant changes in values.

Maximum Subsidence & Expected Extensive Strain (NCB 1975)

	Feet	Meters
Panel Width =	900	274
Seam Height =	10.5	3

Depth of Cover		Width to Depth (a)		Maximum Subsidence(S)	Factor NCB Fig. 15	Extension Strain (E)
Feet	Meters	Ratio	Feet	Meters	Factors	x 10^{-3}
500	152	0.9	9.5	2.9	.65	12.4
1000	305	0.75	7.9	2.4	.66	5.2
1100	335	0.71	7.5	2.3	.68	4.6
1200	366	0.68	7.1	2.2	.70	4.1
1300	396	0.65	6.8	2.1	.70	3.7
1400	427	0.59	6.2	1.9	.75	3.3
1500	457	0.54	5.7	1.7	.78	3.0
2000	610	0.38	4.0	1.2	.82	1.6
2500	762	0.28	2.9	0.9	.80	0.9

The most favored technique until recently has been the use of the empirical charts developed by the National Coal Board (NCB). The above calculations were obtained using the empirical charts developed by the National Coal Board (NCB). Comparisons, as stated in the SME handbook, of US subsidence data with NCB predictions highlight the following differences between coalfields in the US and UK: Most of the studies in the US are limited to the Eastern US coalfields with a very limited data base applicable to western conditions.

With the exception of Illinois, maximum subsidence factors observed in US coalfields are less than predicted by NCB.

The limit (draw angles in the US coalfields tend to be less then the 35 degree value generally accepted by NCB.

The points of inflection of the subsidence profiles over US coal mines are generally closer to the panel centerline compared to the NCB profile. This effect is dependent not only on the percentage of competent strata in the overburden but also on their locations relative to the ground surface and their thickness.

Surface strains and curvatures observed over US longwall panels have been shown to be significantly higher then NCB predictions, almost four times larger in many cases.

The pace at which subsidence occurs depends on many controls including the type and speed of coal extraction, the width, length and thickness of the coal removed, and the strength and thickness of the overburden. Observations of subsidence by Dunrud over the Geneva and Somerset Mines indicate that subsidence effects on the surface occurred within months after mining was completed, and the maximum subsidence was essentially completed within 2 years of the completion of retreat mining.

Dr. Roy Sidle found in his study of Burnout Creek that subsidence impacts to streams are temporary and self healing.

The Sidle Study is representative of the conditions found in the Lila area because:

- the lithology is very similar between the Book Cliffs and the Wasatch Plateau
- the cover thickness ranges from 600 - 800 feet which falls within the rage expected at Lila, and
- the seam thickness of 8-10 feet is in the same range expect at Lila.

An Executive Summary of his study and published findings follows:

Title : Stream response to subsidence from underground

coal mining in central Utah

5. Authors: Sidle-RC Kamil-I Sharma-A Yamashita-S

Short-term geomorphic and hydrologic effects of subsidence induced by longwall mining under Burnout Creek, Utah were evaluated. During the year after longwall mining, 0.3-1.5 m of subsidence was measured near impacted reaches of the mountain stream channel. The major channel changes that occurred in a 700-m reach of Burnout Creek that was subsided from 1992 to 1993 were: extent glides; (2) increases in pool length, numbers and volumes; (3) increases in median particle diameter of bed sediment in pools; and (4) some constriction in channel geometry. Most of the changes appeared short-lived, with channel recovery approaching pre-mining conditions by 1994. In a 300-m reach of the South Fork drainage that was subsided from 1993 to 1994, only channel constriction was observed, although any impacts on pool morphology may have been confounded by heavy grazing in the riparian reaches during the dry summer of 1994. Similar near-channel sedimentation and loss of pool volume between 1993 and 1994 were noted throughout Burnout Creek and in adjacent, unmined James Creek. Subsidence during the 3-year period had no effect on baseflows or near- channel landslides.

No major impacts of subsidence to the surface, caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately ~~2,500'~~3,200'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden, and depth of workings, even with full seam extraction, only minimal subsidence, if any, is anticipated.

Some surface expressions of tension cracks, fissures, or sink holes may be experienced, but should be insignificant. The chances of subsidence-related damage to any perceived renewable resource is minimal.

All dirt roads above the mine are in areas in excess of 1,000 feet of cover or in areas where mining will not take place. The chance of subsidence

negatively effecting these dirt roads is minimal. However, in the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence, the road will remain accessible by regrading and filling in the cracks, fissures or sinkholes.

The unnamed ephemeral channel in the southwest corner of the permit area is located in an area where no mining is planned or over the top of a bleeder system that will not be second mined. The chance of subsidence negatively effecting this ephemeral channel is minimal. However, in the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence the channel will be regraded and the cracks, fissures or sinkholes will be filled in by hand methods due to its inaccessibility.

A small portion of Little Park Wash, which is ephemeral, has less than 1,000 feet of cover in the southwest corner of the permit area. The portion with less than 1,000 feet of cover runs diagonally across one longwall panel and then parallel to the bleeder system in the second longwall panel. In the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence the channel will be regraded and cracks, fissures or sinkholes will be filled in. Since this stream channel is accessible and is traversable by 4 wheel drive, access for repairs would not be a problem. If any subsidence repairs cannot be fixed using hand methods, small earth moving equipment could be used.

DWR and BLM Wildlife Biologists, in consultation with the Division, have determined that any loss of snake dens to subsidence would be random and a minor impact to the population of snakes.

525.130 A survey was conducted within the proposed permit area and adjacent area and it was determined that

limited renewable resource lands exist within the area surveyed. Limited areas were found which contribute to the long-range productivity of water supply or fiber products. No structures exist within the permit area in which subsidence, if it occurred, could cause material damage or diminution for reasonably foreseeable use. See Plates 5-5 and 5-3 for areas of potential subsidence. Identification and data for the State appropriated water supplies can be found in chapter 7 section 727.

All State Appropriated water rights within the maximum limit of subsidence that could be affected, are either owned by the Operator or by the BLM. The BLM has been notified of the water rights survey by means of the submittal of the permit application.

According to Mark Page (State Water Rights), there is not a water conversation district associated with Lila Canyon Mine.

525.200. Protected Areas

525.210. Since there are no public buildings or other facilities such as churches, school or hospitals, and since there are no impoundments with a storage capacity of more than 20 acre-feet, this section does not apply.

525.220. Since R645-301-525.210 does not apply, this section
does not apply.

525.230. Since there are no planned operations under urbanized areas, cities, towns, and communities, or adjacent to industrial or commercial buildings, major impoundments, or perennial streams this section does not apply.

525.240. A detailed plan of the underground workings, including maps and descriptions of significant

features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measures taken to prevent or minimize subsidence and related damage, and areas of full extraction can be found in the R^2P^2 on file with the BLM local and state offices.

525.300. Subsidence control.

525.310. Measures to prevent or minimize damage.

525.311 No attempt will be made to prevent subsidence in any area except where the escarpment near the outcrop is to be protected and to insure that subsidence remains within the permit area. The use of continuous miners in a pillar section as well as longwall technology provides for planning subsidence in a predictable and controlled manner. Some surface expressions of tension cracks, fissures, or sink holes may be experienced but should be insignificant. The chances of subsidence related damage to any perceived renewable resource is minimal. The value and foreseeable use of the surface lands will not be affected by potential subsidence.

525.312 Since there are no buildings or occupied residential dwellings or structures within the Lila Canyon project area this section does not apply.

525.313 Room-and-pillar mining in addition to longwall methods will be used at the Lila Canyon Mine.

525.400. Since state-appropriated water supplies exist on the surface, 525.400 has been addressed.

525.410 Coal will be removed using a combination of

continuous miner and long wall methods as described in sections 522 and 523. Sequence and timing for the development of underground workings are also discussed in sections 522 and 523.

525.420 Plate 5-5 shows the underground workings, and depicts areas where first mining or partial mining will be utilized to protect the escarpment and raptor nests that may exist on the escarpment, and to insure that subsidence remains within the permit area. State-appropriated water rights are shown on Plates 5-3, 5-5 as well as Plate 7-1.

525.430 No major impacts of subsidence to the surface caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately ~~2,300'~~3,200'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden and depth of workings, even with full seam extraction, only minimal subsidence, if any, is anticipated.

525.440 Aerial subsidence monitoring will be done annually while the significant subsidence is taking place. The subsidence monitoring will be initiated in an area prior to any 2nd mining being done within that area. Initially a 200 foot grid along with baseline photograph will be established prior to any 2nd mining. Approximately 12-16 control points will be needed to cover the total mining area. Six of these points will be located outside of the subsidence zone. The accuracy of this survey will be plus or minus 6" horizontally and vertically. From this data a map will be created that will show subsided areas. Once per year a follow up aerial will be performed to determine the extent and degree of active subsidence. Subsidence monitoring will

continue for a minimum of 5 years after the mining ceases. If at the end of the 5 year period the annual subsidence in any of the 3 prior years measures more than 10 percent of the highest annual subsidence amount, subsidence monitoring will continue until there are 3 consecutive years where the annual subsidence amount is less than 10 percent of the highest annual subsidence amount. If for three years in a row the subsidence is measured to be less than 10% of the highest subsidence year, subsidence will be determined to be complete, and no additional monitoring for that area will be required.

"A ground survey of the mine permit area 'where secondary extraction has occurred over the last year' will be conducted in conjunction with the quarterly water monitoring program." Identified features will be monitored until they are repaired or self-healed. The survey will be conducted on roads, adjacent to stock watering ponds, and in drainage channels where they cross tension areas relative to the underground extraction areas."

"The results of this survey will be documented quarterly in a written report which provides global positioning co-ordinates as well as the following information;

A) a description of the identified subsidence related feature,
B) length, and width measurements, and compass bearing,
C) dated photographic documentation,
D) located on a topographic overlay map of the underground disturbed area.
E) if the feature is determined as significant, the Division will be notified within a 48 hour period.
F) A written report, compiling the four quarterly reports for the monitoring year, will be submitted as part of the Annual Report required by the Division.
G) The commitment "to restore the land where

subsidence damage has affected the use of the surface" must be revised to read "to restore the land where subsidence damage has been determined as significant enough to require repair, as determined by the Division".

Two areas of the permit have stream reaches with less than 1,000 feet of cover over the coal seam. As discussed in Section 525.120, it is not envisioned that subsidence will negatively impact these areas. During periods of 2nd mining under areas of intermittent or perennial streams, a ground survey will be conducted of the stream channels every two weeks. These ground surveys will be continued for a period of 3 months following the 2nd mining.

The ground survey will consist of walking and photographing the various areas of the surface over the mine where subsidence might occur. If evidence of subsidence is identified, the area of subsidence will be surveyed and the extent of the disruption identified. Depending on the extent and location of the damage, mitigation measures will be reviewed and implemented. Due to the fact that mitigation options change with time as new technology and measures are developed, better options may be implemented in the future. However, ~~UEI~~ECCR provides a commitment that where subsidence damage affects uses of the surface, the land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence. The surface effects will be repairs as described in Section 525.500.

525.450 Subsidence control measures.

525.451. No backstowing or backfilling of voids used as a subsidence control measure is planned at this time. Therefore, this section is not applicable.

525.452. Support pillars as a subsidence control measure is not anticipated at this time. However, an area of partial mining where an unmined coal block will be left for subsidence control is shown on Plate 5-5. First mining indicates an area where a block of coal is roomed leaving pillars for support with no mining of the remaining pillars. Partial mining as shown on Plate 5-5 indicates an area where a block of coal has been isolated without the rooms being developed. Both first mining and partial mining will leave support that can be used to control subsidence. If the partially mined area shown on Plate 5-5 is ever roomed out, the area now defined as partially mined would become an area defined as being first mined.

525.453. An outcrop barrier of coal will be left to protect the escarpments at the outcrop. As per the R2P2, only first mining will be allowed within 200' of the outcrop. Mains, submains, and ventilation portals will be allowed within the outcrop.

525.454 No measures will be taken on the surface to prevent material damage or lessening of the value or reasonable foreseeable use of the surface.

525.460. Anticipated effects of planned subsidence may include tension cracks, fissures, or sink holes. Areas of minimal ground lowering may be anticipated. The chances of subsidence-related damage to any perceived renewable resource is minimal.

525.470. Since no urbanized areas, cities, towns, public buildings, facilities, churches, schools, or hospitals exist within the permit area this section does not apply.

525.480. There are no plans to change or modify the mining

plan to protect any springs or seeps. Springs with water rights will be monitored for flow and quality as described in Chapter 7 Section 731.211. ~~UEI~~ECCR has committed to provide for mitigation of any lost water rights as per Chapter 7 Section 727.

525.490. Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with R645-301-525.300 will be provided.

525.500. Repair of damage.

525.510. If effects of subsidence are confirmed, any material damage to the surface lands will be restored to the extent technologically and economically feasible. The land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence.

525.520. Since no structures exist within or adjacent to the permit area which could be damaged by subsidence, should it occur, this section does not apply.

525.530. The Little Park Road exists in the subsidence zone. In the unlikely event the road is damaged by subsidence, ~~UEI~~ECCR will repair the damage as per Section 525.120.

525.600. Public Notice.

At least six months prior to mining, or within that period if approved by the Division, the underground mine operator will mail a notification to all owners and occupants of surface property and structures above the underground workings. The notification oil include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

526. A narrative explaining the construction, modification, use, maintenance and removal of the mine facilities follows. Additional information can be found in Appendix 5-4 and Chapter 8.

526.100 Mine Structures and Facilities.

526.110 The only existing structures are found in Horse Canyon (Part "A" of this permit) and are the remains of the United States Steel operation. Horse Canyon has received phase II bond release, and the remaining structures have been left in place for future use. Only three existing structures, a 60" and a 48" CMP culverts located near the new proposed surface facilities, and the County road on top of Little Park, can be found within the Lila Canyon Permit. The existing culvert is shown on plate 5-1A. The existing road on Little Park can be found on Plate 5-1 as well as most other plates showing the surface area of the Lila Canyon Permit. Several vehicle ways will be used for water and subsidence monitoring. These ways branch off the Little Park Road and generally follow the ephemeral drainages. The ways are shown on Plate 5-1 as well as most other plates showing the surface area of the Lila Canyon Permit. More detail of the existing Little Park Road can be found in Appendix 5-4.

526.111 The location of the existing culverts is shown on Plate 5-1A.

526.112 Most of the existing 48" culvert is outside the permit boundary and is Emery County's responsibility. ~~UEI~~ECCR will grade the site so that during reclamation and operations surface flows will be directed away from the 48" culvert. The 60" culvert is in poor condition and will be replaced by the County. ~~UEI~~ECCR will add on to the culvert during the operation and reclamation phase. The bottom 30' is the responsibility of the County, the upper portion is the responsibility of ~~UEI~~ECCR.

526.113 It is believed that the existing culverts were installed with the road construction around 1940.

526.114 Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply.

526.115 Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. The County road and the culvert within the disturbed area boundary will be modified or reconstructed by the County.

526.115.1. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.115.2. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.115.3. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.115.4. Since the existing culvert is going to be removed upon construction of the sediment pond, this section does not apply. See Appendix 5-4 for existing road details.

526.116 The only coal mining and reclamation operations that are planned within 100 feet of the County Road are an office complex,

sediment ponds, topsoil pile, and security shack. The permit area adjacent to the county road will be fenced to protect the public from the sediment pond and other mine associated buildings. Other than fencing, no additional measures are planned after the construction phase. During construction, measures to control traffic on the County Road will be taken to protect the public from construction related hazzards.

526.116.1. A cooperative agreement with Emery County ,as stated in Appendix 1-4, requires a six foot chain link fence to be constructed adjacent to the Lila Canyon Road to provide safety to the general public in the proximity to the mine site and mine related structures and activities.

526.116.2. At the current time, there are no plans to relocate any public road.

526.200 Utility Installation and Support Facilities.

526.210 All coal mining and reclamation operations will be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells, oil, gas, and coal-slurry pipelines, railroads, electric and telephone lines, and water and sewage lines which may pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the Division. Since no existing services are found within the projected disturbed area, no negative impact to any service is anticipated.

526.220 The new support facilities are described in section 520 and in Appendix 5-4 and shown on plate 5-2 and will be operated in accordance with the mine reclamation plan. Plans and drawings for each support facility to

be constructed, used or maintained within the permit area are found in Appendix 5-4, Plates 5-7A, 5-7B, and 5-8.

526.221 The new facilities designs shown in Appendix 5-4 prevent or control erosion and siltation, water pollution, and damage to public or private property, and:

526.222 The new facilities designs shown in Appendix 5-4 minimize damage to fish, wildlife, and related environmental values; and minimize additional contributions of suspended solids to stream flow or runoff outside the permit area to the extent possible by using the best technology currently available.
Islands of undisturbed areas within the permit area will be visually monitored for coal fines deposition. If monitoring reveals coal fine deposition, then water sprays on the area from which the fines are originating will be warranted as per the August 27, 1999 Approval Order.

526.300 Water pollution control facilities consist of sedimentation control and properly designed sewage systems.

The sedimentation control is accomplished by containing all disturbed area runoff in a properly sized sedimentation pond. Complete designs are presented in Appendix 7-4 and on Plate 7-6.

The sewage system will consist of a septic tank and drainfield. Complete designs are presented in Appendix 5-4.

The drain field design and layout are shown on plate 5-2, and details are shown in Appendix 5-4.

526.400 Since Lila Canyon Mine is an underground operation, this section does not apply.

527. Transportation Facilities.

527.100 All new roads within the disturbed area have been classified as primary.

527.110 See Sections 527.120 and 527.130.

527.120 The Slope Access Road / Portal Access Road and the Mine Facilities Road / Truck Loadout Road will be used frequently for access for a period in excess of six months, and or will transport coal. They are classified as primary roads.

527.121 See 527.120 above.

527.122 See 527.120 above.

527.123 Since none of the new roads planned within the disturbed area will be retained for an approved postmining land use, this section does not apply.

527.130 There are no ancillary roads within the disturbed area.

527.200 A detailed design and description for each road, and conveyor to be constructed used, and maintained within the proposed permit area is included in Appendix 5-4. The roads are show on Plate 5-2.

527.210 The specifications for each road width, road gradient, road surface, road cut, fills, embankments culverts, drainage ditches and drainage structures are shown on Plate 5-2 and in Appendixes 5-4 and 7-4.

527.220 Since no alteration or relocation of natural drainage ways is anticipated, this section is not applicable.

527.230 Roads shall be maintained in manner that allows them to meet their design standards throughout their use.

527.240 If any of the roads on the disturbed area is damaged by a catastrophic event, the road will be repaired as soon as practical

after the damage has occurred.

527.250 Steep cut slopes or requests for alternative specifications are not anticipated at this time therefore this section does not apply.

528. Handling and Disposal of Coal, **Overburden, etc:**

A narrative explaining the construction modifications, use, maintenance and removal of coal, overburden, excess spoil and coal mine waste.

528.100 Coal will be mined using continuous miners and longwall equipment. The coal will be transported from the face and deposited on the underground mine belts using shuttle cars or continuous haulage equipment. The coal will be transported by a series of conveyor belts from the section to the run of mine stockpile. The coal will be removed from the run of mine stockpile by a reclaim belt to an enclosed crusher/screen. Once crushed the coal will be conveyed to a storage bin from which it will loaded in to coal haul trucks for transportation to a unit train loadout.

528.200 Overburden: Lila Canyon is an underground operation, and it is not anticipated that any material that overlays the coal seam, consolidated, or unconsolidated, other than topsoil, will be disturbed. Therefore, this section does not apply.

528.300 Spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures are discussed below.

528.310 Excess Spoil: Since Lila Canyon is an underground operation, it is not anticipated that any spoil will be generated. Therefore, this section does not apply.

528.320 Coal Mine Waste: All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized coal chunks from the screens will be crushed and put back into the ROM stream. The temporary mine development waste pile and slope rock disposal area are shown on Plate 5-2 and in Appendix 5-7.

528.321 Coal processing waste produced from the screen will not be returned to any abandoned underground workings. Any and all of the coal processing waste from the screen will be crushed and reintroduced into the ROM stream for sale.

528.322 Refuse Piles. Each pile will meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215, meet the design criteria of R645-301-210, R645-301-512.230, R645-301-513.400, R645-301-514.200, R645-301-515.200, R645-301-528.320, R645-301-536 through R645-301-536.200, R645-301-536.500, R645-301-536.900, R645-301-542.730, R645-301-553.250, R645-301-746.100, R645-301-746.200, and any other applicable requirements.

528.323 Burning and Burned Waste Utilization.

528.323.1. Coal mine waste fires will be extinguished by the person who conducts coal mining and reclamation operations, in accordance with a plan approved by the Division and MSHA. The plan will contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, will be involved in the extinguishing operations. The coal mine waste fire plan can be found in Appendix 5-3. MSHA approval is not required unless you have an actively burning fire. (Phone conversation with Billy Owens MSHA Denver 5/31/05)

528.323.2. No burning or burned coal mine waste will be removed from the permitted disposal area.

528.330 Noncoal Mine Waste.

528.331 Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber and other combustible materials generated during mining activities will be placed and stored in a controlled manner in a designated portion of the permit area. The noncoal mine waste will be placed in dumpsters and emptied on a as needed basis. The designated noncoal waste area (concrete trash chute) is shown on Plate 5-2. Circumstances may arise where equipment must be abandoned underground. If this circumstance arises, the operator must get approval from the BLM and the Division prior to abandoning equipment in place.

~~UtahAmerican Energy~~Emery County Coal Resources, Inc. is abandoning the current set of 106 DBT longwall shields upon completion of Panel #6. From Panel #7 going forward in the mine plan, a new set of longwall equipment will be installed and utilized for coal extraction. Every component from our current longwall installation including the shearer, pan line, conveyor chain, stage loader, crusher, current belt installation, and associated belting in Panel #6 will be recovered except for the 106 longwall shields. In order to avoid any adverse environmental impacts from the shields, the mine will run water through the shields as opposed to emulsion in the last few passes of

production to remove any oils before the recovery process proceeds. These shields would be abandoned in the mine under 1000 feet of cover, with no foreseen environmental impacts to ground water due to the depth of cover and grade of the coal seam. Although a longwall move is routine, completed safely, and occurs several times a year at Lila Canyon, there is inherent exposure that is associated with a longwall move. By not extracting these shields and leaving them in the mine, this removes any opportunity for an accident as a result of the longwall move. Upon completion of mining in District #2 the shields will be behind seals for the remainder of the mine life. See plate 5-5a.

528.332 It is anticipated that final disposal of noncoal mine wastes will be at the ECDC facility near East Carbon City. Concrete will be disposed of in a specified area, refer to Plate 5-6 for this location. The disposal site will be located under the reclaimed coal stockpile. This area will receive the maximum fill during reclamation. Placement of this fill around the concrete will help to eliminate runoff. This will ensure that leachate and drainage does not degrade surface or underground water. The noncoal mine waste will be placed in dumpsters and emptied on an as-needed basis.

528.333 The noncoal mine waste will be disposed of at the ECDC facility near East Carbon City.

528.334 Notwithstanding any other provision to the R645 Rules, any noncoal mine waste defined as "hazardous" under 3001 of the Resource Conservation and Recovery Act (RCRA) (Pub. L. 94-580, as amended) and 40 CFR Part 261 will be handled in accordance with the requirements of Subtitle C of RCRA and any implementing regulations.

528.340 A description of the disposal methods for placing underground waste and excess spoil generated at surface areas according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-301-512.220, R645-301-514.100, R645-301-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-536.600, R645-301-542.720, R645-301-553.240, R645-301-

745.100, R645-301-745.300, and R645-301-745.400 is covered in sections 535, and 536.

528.350 A description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with R645-301-528.330, R645-301-537.200, R645-301-542.740, R645-301-553.100 through R645-301-553.600, R645-301-553.900, and R645-301-747 is included.

528.400 Dams, embankments and other impoundments. See Section 700 and Appendix 7-4.

529. Management of Mine Openings:

The permit application includes a description of the measures to be used to seal or manage the openings within the proposed permit area. New slope or drift openings required to be sealed shall be sealed with solid, substantial, noncombustible material for a distance of at least 25 feet into such openings. The closure design for portals, slopes, and drifts, can be found in Appendix 5-6.

529.100 Shafts or other exposed underground opening when no longer in use will be cased, lined, or otherwise managed as approved by the Division. All openings exposed by mining operations within the permit area will be permanently closed unless approved for water monitoring.

529.200 For the purposes of Underground Coal Mining and Reclamation Activities:

529.210 Mine entries which are temporarily inactive, but have a further projected useful service under the approved permit application, will be protected by barricades or other covering devices, fenced, and posted with signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices will be periodically inspected and maintained in good operating condition by the person who conducts the activity.

529.220 Since no portals are projected to return underground development waste, coal processing waste or water to the mine, this section does not apply. There is no current need to return any waste to the underground workings.

529.300 Section 529 does not apply to holes drilled and used for blasting.

529.400 No openings have been identified for use to return coal processing waste to underground workings. Therefore, this section is not applicable.

530. Operational Design Criteria and Plans.

531. General plans for the sediment pond and refuse pile are found within this section.

532. Sediment control measures can be found in Chapter 7.

532.100 The smallest practicable area will be disturbed during the life of the project. Progressive backfilling, grading, and prompt revegetation of applicable will be completed as per R645-301-353.200.

532.200 Backfilled material will be stabilized to promote a reduction of the rate and volume of runoff in accordance with R645-301-537.200, R645-301-552 through R645-301-553.230, R645-301-553.260 through R645-301-553.420, R645-301-553.600, and R645-301-553.900.

533. Impoundments.

533.100 Since no impoundments meeting the criteria of 30 CFR 77.216(a), this section does not apply.

533.200 Two impoundments are planned for this site: Pond #1 and Pond #2. The sediment ponds are

temporary structures. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.210 The sediment ponds will be incised, except for the dam/road embankment. This embankment will be reconstructed and compacted to at least 95%. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.220 Where fill is to be placed, natural ground shall be removed 12" below the structure. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.300 Rip-rap or other protection (culverts, concrete) will be placed at all inlets and outlets to prevent scouring. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1. Also see Plates 7-6a and 7-6b.

533.400 External slopes of the impoundment will be planted with an approved seed mix to help prevent erosion and promote stability. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.

533.500 This section does not apply. There are no vertical highwalls associated with this impoundment.

533.600 Since no impoundments are planned that meet the criteria of MSHA, 30 CFR 77.216(a), this section does not apply.

533.700 Design and construction requirements, as well as operation and maintenance requirements, are detailed in Appendix 7-4, Section 3.1.

534. Roads. The designs for surface roads can be found in Appendix 5-4.

534.100 The roads have been designed, located, constructed and will be maintained to:

534.110 The roads have been designed, located, constructed and will be maintained to prevent or control damage to public or private property.

534.120 Non-acid or nontoxic-forming substances will be used in road surfacing.

534.130 The designs for the roads can be found in Appendix 5-4.

534.140 The reclamation plan for the roads can be found in section 542.600.

534.150 The roads have been designed to prevent or control erosion, siltation and air pollution.

534.200 Appropriate limits for grade, width, and surface materials have been used in the design of the roads.

534.300 Primary Roads. Primary roads will meet the requirements of R645-301-358, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-542.600, R645-301-542.600, and R645-301-762, and any necessary design criteria established by the Division, and the following requirements.
Primary roads will:

534.310 The roads will be located insofar as practical, on the most stable available surfaces.

534.320 The roads will be surfaced with rock, crushed gravel, asphalt, or other material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road;

534.330 The roads will be routinely maintained to include repairs to the road surface, blading, filling potholes and adding replacement gravel or asphalt. It will also include revegetating, brush removal, and minor reconstruction of road segments as necessary.

534.340 Culverts, if required, will be designed, installed, and maintained to

sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

535. Spoil: It is anticipated that no spoil will be produced at the Lila Canyon Mine. Therefore, this section is not applicable.

536. Coal Mine Waste: The proposed Lila Canyon Mine could produce 2 separate types of coal mine waste:

1. Normal coal processing waste or refuse and;
2. Underground development waste (rock slope material).

All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. The rock slope material / underground development waste will be examined and tested as necessary to determine acid- or toxic-forming potential.

536.100 All underground development waste, other than the rock slope material, will be brought to the surface and will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface.

536.110 The refuse pile will be designed to attain a minimum long-term slope stability safety factor of 1.5. See Appendix 5-7.

536.200 Underground development waste brought to the surface will be deposited according to the plan described in Appendix 5-7.

536.300 Since no spoil fills will be generated this section does not apply.

536.400 Since there will not be any impounding structures constructed of coal mine waste this section does not apply.

536.500 As discussed in Section 536 and 536.300, it is proposed to dispose of the rock slope material / underground development waste within the rock disposal area and be used as structural fill as shown on Plate 5-2.

536.510 It is not anticipated that coal mine waste materials from activities located outside the permit area be disposed of in the permit area. Therefore this section does not apply.

536.520 It is not anticipated that coal mine waste will be brought to the surface then taken back underground for disposal therefore this section does not apply.

536.600 In areas where slope rock or coal processing waste is deposited, the topsoil will be removed and stored in the topsoil stockpile area until reclamation.

536.700 It is not anticipated that coal processing waste will be returned to abandoned underground workings therefore this section does not apply

536.800 Since no coal processing waste banks, dams, or embankments are planned for the Lila Canyon Mine therefore, this section does not apply.

536.900 Refuse Piles. (See Appendix 5-7) The refuse pile is designed to meet the requirements of R645-301-210, R645-301-512.230, R645-301-513.400, R645-301-514.200, R645-301-515.200, R645-301-528.322, R645-301-528.320, R645-301-536 through R645-301-536.200, R645-301-536.500, R645-301-536.900, R645-301-542.730, R645-301-553.250, R645-301-746.100 through R645-301-746.200, and the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215.

537. Regraded Slopes.

537.100 Each application will contain a report of appropriate geotechnical analysis, where approval of the Division is required for alternative specifications or for steep cut slopes under R645-301-358, R645-301-512.250, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-534.300, R645-301-542.600, R645-301-742.410, R645-301-742.420, R645-301-752.200, and R645-301-762.

540. Reclamation Plan. (See Appendix 5-8 for reclamation plan, and Appendix 5-9 for supplemental reclamation procedures for culverts UC-5, UC-6 and UC-7.)

541. General.

541.100. The operator is committed to performing all reclamation as in accordance with R645 rules.

541.200. N/A. The operator is not involved in surface mining activities.

541.300. The operator is committed to the removal of all equipment facilities and structures upon cessation of mining activities.

541.400. The operator will address all reclamation activities as referenced in Chapter 5 of this document.

542 Narratives, Maps and Plans.

542.100. See Table 3-3 time table based on project reserves markets and life of mine.

542.200. The perimeter of the disturbed area contains approximately 40.1~~2~~1 surface acres within the disturbed area but only 3~~3~~4.9~~9~~7 acres will be disturbed, leaving ~~6~~5.1~~3~~4 acres of undisturbed islands within the disturbed area.
The following R645 regulations will give detailed description and reclamation procedures to address these areas of disturbance. The reclamation plan for the sediment pond and drainage control structures can be found in Appendix 7-4.

Topsoil amounts can be found in Section 232.100 and are calculated from Plate 2-3. Concrete amounts can be calculated from the text in Section 520. Coal Mine Waste volumes can be found in Appendix 5-7. Volumes were calculated using a Cad system.

542.300. Included.

542.310. Included. (See Plates 5-6 & 7-7)

542.320. There will not be any surface facilities left post mining.

542.400. Not applicable. No surface facilities will remain post bond liability period.

542.500. A reclamation time table is included as Table 3-3.

542.600. All roads within the disturbed area will be reclaimed immediately after they are no longer needed for mining and reclamation operations, except for the upgraded portion of County Road #R.S. 2477. At the time of reclamation, the Bureau of Land Management (BLM) and Emery County will be given the option of keeping the upgrades to this portion of the roadway, reclaim the roadway to its original condition. The Division will be notified of the final decision.

542.610. The time table of reclamation activities will enable the roads to be removed concurrently with reclamation activities. So, no closures specific to traffic would be anticipated except for the upgraded portion of the Emery County Road #R.S. 2477. Minimal closures may be required for the upgraded portion, if it is reclaimed.

542.620. All bridges and culverts will be removed concurrent with reclamation.

542.630. All disturbed areas will be ripped and top soiled prior to revegetation activities in compliance with all applicable R645 regulations. (See Appendix 5-8)

542.640. Road surfacing materials such as sand and gravel,

which are not suitable for revegetation establishment, will be buried on site and covered with a minimum of two feet of material that would support vegetation. Concrete will be disposed of in the designated area and covered with four feet of cover. Asphalt will be disposed of off site, either in a landfill or sent to a recycling facility.

542.700. Final Abandonment of Mine Openings and Disposal Areas.

542.710. Appendix 5-6 depicts a typical seal that will be constructed at all mine openings.

542.720. No excess spoil is anticipated at this time.

542.730. All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface.

542.740. Disposal of Noncoal Mine Wastes.

542.741. All non coal waste will be temporarily stored on site in approved waste bins and commercially picked up and transported to an approved disposal site. Non Coal waste generated during reclamation (such as concrete structure, buried culverts, utility lines,

septic systems etc.) will be buried in the refuse disposal area and covered with a minimum of four feet of fill.

542.742. No noncoal waste will be stored on site or disposed of on site during the life of the mine.

542.800. A detailed cost break down is included in Chapter 8, Appendix 8-1 relative to bonding.

550 Reclamation Design Criteria and Plans. Each permit application will include site specific plans that incorporate the following design criteria for reclamation activities.

551. All underground openings will be sealed as detailed in Appendix 5-6.

552. Permanent Features.

552.100. In the course of reclamation, areas that have been recontoured and top soiled will be “pock-marked,” creating small basins that will facilitate vegetation establishment as well as minimizing erosion.

552.200. No permanent impoundments will be left post reclamation.

553. The operator will comply with all regulations applicable to underground mining activities relative to backfilling and grading as required by R645 regulations.

Some minor cut slopes along the reclaimed road may be left after reclamation due to the difficulty and inability to reclaim all material pushed over the side while making the road cut. See

plate 5-7B-2, cross section 16+00 for details. ~~UEI~~ECCR will make reasonable efforts to minimize the cut slopes being left.

553.100. Disturbed Areas. Disturbed areas will be backfilled and graded to:

553.110 The operator will obtain a post mining topography similar in form as what existed premining.

553.120 Since Lila Canyon is an underground operation, no spoil piles will be created. Minor highwalls may be created with the development of the rock slope portals. Upon completion of mining these entries will be sealed as per Closure for Mine Openings Appendix 5-6 and all highwalls will be eliminated during the reclamation phase of the operation. Plate 5-9 shows the proposed portal plan. During reclamation, suitable material will be placed against the portals. This material will be shaped to eliminate the highwall and to bring the slope back to the approximate original contour.

553.130 All fill slope will have a static safety factor of 1.3 as shown in Appendix 5-5.

553.140 Erosion and water pollution will be minimized on site by the use of drainage control structures (berms, channels and silt fence) and the use of small depressions, soil tackifiers, mulch and sediment pond design. No water is anticipated leaving the reclaimed site prior to adequate treatment in the form of retention and/or filtration that does not meet and/or exceed UPDES standards.

553.150 The post mining land use of wildlife and domestic grazing should be enhanced to some degree with the revegetation of a more

desirable seed mix and a vegetative cover in excess of what was present premining.

553.200 Spoil and Waste.

553.210 All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.220 Since no spoil will be produced this section does not apply.

553.221 All vegetation and /or organic material will be removed prior to any coal mine waste being stored.

553.222 All useable topsoil or topsoil substitute will be removed from the structural fill and refuse areas prior to use. Table 2-1 shows estimates of salvageable soil by soil type based on current NRCS soil inventories. The location of the soil storage is shown on Plate 5-2. This material will be spread over the recontoured structural fill and refuse areas prior to seeding and mulching.

553.223 Since no spoil will be produced this section does not apply.

553.230 All recontoured areas will be compacted to minimize slippage. The area will then be over laid with topsoil and ripped. In addition the area will be “pock-marked” to minimize the potential for erosion, as well as enhance revegetation establishment. It is not anticipated that soil will be disturbed in areas too steep for equipment to operate.

553.240 The structural fill area will have slopes of less than 8% upon final recontouring, and revegetated to enhance the post mining land use of grazing and wildlife habitat.

553.250 A need for a refuse pile at Lila Canyon is not anticipated.

553.260 The operator will commit to all applicable R645 regulations relative to disposal of coal processing waste.

553.300 All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.400 Cut-and-fill terraces may be allowed by the Division

553.410 No cut and fill terraces will be required.

553.420 No terraces will be required for post mining land use.

553.500-540 and 553.600-553.650.500

The only area that falls under these provisions are the reclaimed Horse Canyon mine which lies in the north west portion of the lease area and is addressed under approved MRP Act #0013.

553.700-553.900

This operation will only involve underground mining, and as such the above referenced regulations do not apply.

560. Performance Standards. Coal mining and reclamation operations will be conducted in accordance with the approved permit and requirements of R645-301-510 through R645-301-553.

Horse Canyon Extension
Lila Canyon Mine

Chapter 7
Hydrology
09-003

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Chapter 7

700. HYDROLOGY

710. Introduction

711. General Requirements

711.100 The existing hydrologic resources of the proposed Lila Canyon Mine area are detailed under section 720.

711.200 The proposed operations and potential impacts to the hydrologic balance are described in Sections 728 and 730.

711.300 All methods and calculations utilized to achieve compliance with hydrologic design criteria and plans are described in Section 740 and Appendix 7-4.

711.400 Applicable performance standards

711.500 Reclamation hydrology is described in Section 760 and in Appendix 7-4.

712. All cross sections, maps and plans required by R645-301-722 as appropriate, and R645-301-731.700 have been prepared and certified according to R645-301-512.

713. Impoundments will be inspected as described under Section 514.300:

A professional engineer or specialist experienced in the construction of impoundments will inspect the impoundment.

Inspections will be made regularly during construction, upon completion of the construction, and at least yearly until removal of the structure or release of the performance bond.

The qualified, registered professional engineer will promptly, after each inspection, provide to the Division, a certified report that the impoundment has been constructed and maintained as designed and in accordance with the approved plan and the R645 Rules. The report will include discussion

of any appearances of instability, structural weakness or other hazardous conditions, depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation and any other aspects of the structure affecting stability. (See Appendix 5-2 for the inspection form).

A copy of the report will be retained at or near the mine site.

There are no impoundments at this site subject to MSHA, 30 CFR 77.216; therefore, weekly inspections are not required.

Impoundments not subject to MSHA, 30 CFR 77.216 will be examined at least quarterly by a qualified person designated by the operator for appearance of structural weakness and other hazardous conditions.

720. Environmental Description

721. General. The following information will present a description of the existing, pre-mining hydrologic resources within the proposed permit and adjacent areas. This information will be used to aid in determining if these areas will be affected or impacted by the proposed coal mining activities.

The proposed Lila Canyon Mine is located, in the southwestern portion of the Book Cliffs in Emery County, Utah, approximately 2 miles south of the old Horse Canyon Mine, formerly operated by Geneva Steel Company. The proposed mining will be in the Upper (and possibly Lower) Sunnyside Seam of the Blackhawk Formation.

Existing hydrologic resources of the area consist of: Surface water resources - intermittent by rule with ephemeral flow streams; and Groundwater resources - springs and seeps and perched, isolated aquifers. These resources have been evaluated using hydrologic data from the Horse Canyon Mine, water level piezometers, and seep/spring inventory data of the proposed mine and adjacent areas. Plates 7-1 and 7-1A show the locations of the surface drainages, springs and seeps, and piezometers.

722. Cross Sections and Maps

722.100 Subsurface Water. The locations where subsurface water, including springs and seeps, have been identified are presented on Plates 6-1 and 7-1 and data results are included in Appendix 7-1. Relevant cross sections of subsurface water, geology, and drill holes are shown on Plate 6-1. Where sufficient data are available, the seasonal head differences are presented on contour maps (see Figure 7-2A) and on a piezometer hydrograph plot (see Figure 7-2B).

722.200 Surface Water. Location of all streams and stockwatering ponds or tanks in the area of the mine are shown on Plate 7-1. There are no perennial streams, lakes or ponds known to exist within the proposed permit or adjacent areas.

A new diversion work was thought to have been constructed by the BLM in 2004 at the confluence of the Right Fork of Lila Canyon and Grassy Wash. Water from this diversion was directed to the stock pond located in Section 28, T. 16 S., R 14 E. Figure 1 in Appendix 7-9 shows the location of the diversion and the alignment of the diversion channel to the stock pond. Also, the location of the overflow channel back to Grassy Wash is also presented on the figure. However, the BLM was not involved in the pond improvements. Recent site investigation 2006 shows that the diversion structure described in Appendix 7-9 has been breached and no flow now reaches the pond from Grassy Wash. No other ditches or drains are known to have been constructed in the area of the mine.

722.300 Baseline Data Locations. Locations of all baseline data monitoring points are shown on Plate 7-1. Baseline water quality and quantity data is included in Appendix 7-1.

722.400 Water Wells. Three wells and three piezometers have been identified in the permit and adjacent areas. Two wells are located within the alluvium of lower Horse Canyon Creek. Three water piezometers were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. Drill hole S-32 was drilled and converted to a water monitoring hole by Kaiser in 1981. The details of these wells and piezometers are discussed in Section 724.100 of the application. The location of all these wells and piezometers is shown on Plate 7-1. No information on any other wells has been identified.

722.500 Contour Maps Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2, 5-2A, 7-1 and 7-2. These maps

use U.S.G.S. based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps present greater detail from low-level aerial photography, for greater detail, and are tied to relevant U.S.G.S. elevations to ensure correlation between the maps.

723. Sampling and Analysis

All water quality analyses performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Water quality sampling performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 will be conducted according to either methodology listed above when feasible. "Standard Methods for the Examination of Water and Wastewater" is a joint publication of the American Water Works Association, and the Water Pollution Control Federation and is available from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, D.C. 20036.

724. Baseline Information

This section presents a description of the groundwater and surface water hydrology, geology, and climatology resources to assist in determining the baseline hydrologic conditions which exist in the permit and adjacent areas. This information provides a basis to determine if mining operations can be expected to have a significant impact on the hydrologic balance of the area.

724.100 Ground Water Information. This section presents a discussion of baseline groundwater conditions in the permit and adjacent areas. The data set consists of piezometer, spring and seep inventory data, mine discharge, and mine inflow information from the abandoned Horse Canyon Mine. Appendices 7-1 and 7-6 provide data through the 2002 sampling period. All of these data and other recent data are available in the DOGM electronic database. The data, provided in Appendices 7-1 and 7-6 and the DOGM electronic data base, were obtained from multiple sources, including (but not limited to) on-site sampling efforts, the Horse Canyon Mine P.A.P. filed by Geneva Steel and annual reports, U.S. Geological Survey publications, and various consultant reports. Since not all monitoring parties were required to adhere to UDOGM or SMCRA rules, the laboratory parameters varied between reports. However, the data are still considered valid and appropriate for determining baseline conditions within

the permit and adjacent areas. The location of the sampling points are presented on Plates 7-1 and 7-1A.

History of Data Collection. The U.S. Geological Survey conducted a water quality study in Horse Canyon from August 1978 until September 1979 during the time that U.S. Steel operated the mine. Samples were taken monthly from the Horse Canyon Creek and analyzed for most major ions and cations and field parameters. Metals, eight nitrogen species and other minor chemical constituents were taken on a quarterly basis or less.

Between January 1981 and April 1983, baseline water quality data was collected for four surface water/spring sites B-1, HC-1, RF-1 and RS-2, and 3 UPDES Discharge Points, 001 (Mine Discharge), 002 (Mine Discharge) and 003 (Sewer Plant) , on the Horse Canyon permit area. Between 14 and 19 samples were taken and analyzed during the monitoring period depending on the site. The parameters that were analyzed were derived from Section 783.16 in the regulations. DOGM monitoring guidelines were not in force at that time.

Two other sites, RS-1, and RS-2, were sampled once a year during 1978, 1979, and 1980 and analyzed for most major chemical constituents. In addition, springs H-1, H-6, H-18, and H-21 were sampled once by JBR and analyzed for the major constituents in 1985. Third quarter data for 1989 were collected for B-1, HC-1, RF-1, and RS-2 and sampled for most of the parameters in DOGM's guidelines.

Sample sites B-1, HC-1, RF-1 and RS-2, along with the UPDES Discharge Points 001A and 001B, have been monitored quarterly since 1989 in accordance with the approved water monitoring plan for the Horse Canyon Mine (Part A). The results of this monitoring have been submitted to the Division each year with the Annual Report and or have been entered into the Divisions electronic data base.

Baseline monitoring was also conducted on the proposed Lila Canyon Mine extension area by EarthFax Engineering in 1993-1995. Some 60 sites were identified and monitored. This data is presented in Appendix 7-1.

The operational water monitoring program committed to the permit application was implemented in July, 2000. Data will be collected from new monitoring sites L-1-S through L-4-S. L-5-G has yet to be installed. These sites are typically dry and no quality data has been gathered as yet. Sites L-6-G through L-10-G have been monitored for baseline in 1993, 1994, and 1995. These sites, along with piezometers IPA-1, IPA-2 and IPA-

3, were monitored in December 2000 to determine if they were still viable and to establish a current baseline that will be continuous with operational monitoring.

Sites L-11-G and L-12-G were added in October 2001 to replace sites L-6-G and L-10-G. Sites L-13-S, L-14-S, L-15-S, and L-18-S are being used to determine flow characteristics of the Williams Draw Wash, Wash below L-12-G, Little Park Wash, and Stinky Springs Wash.

Sites L-6-G, L-10-G and L-15-S were determined to either provide no flow data or data that was less representative than the replacement sites and will be suspended from sampling in the 1st quarter of 2003.

Wells. The wells in the mine area consist of two water supply wells, three water level piezometers, and an exploration borehole converted to a monitoring well.

Two wells are located within the alluvium of lower Horse Canyon Creek, near the Horse Canyon Mine. These wells area completed in the aerially small, alluvial aquifer at the mouth of Horse Canyon which contains groundwater likely collect from infiltration of surface flows from the upper Horse Canyon area. As indicated in Section 722.400, the well located near the main Horse Canyon surface facilities, identified as Horse Canyon well on Plate 7-1A, is still open, although not operational at this time. The well was investigated and it was determined that it would not be useful as a piezometer. The pump is sitting on the top of a concrete cap encapsulating the top of the well. The site could not be used as a piezometer without removing the pump. This well will be donated to the College of Eastern Utah as part of the Post Mine Land Use Change. The well located near the road junction, identified as MDC well on Plate 7-1A, is an abandoned well owned by Minerals Development Corporation. This well has been sealed to the operator's best knowledge. No hydrologic data is presently available from either of these wells.

Three water level piezometers were drilled as part of plans to access the Kaiser South Lease by I.P.A. These piezometers were designated IPA-1, IPA-2 and IPA-3, and are located in the Lila Canyon Permit area (see Plate 7-1). IPA monitored these sites for water depth from 7/94 to 4/96. These monitoring results are included in Appendix 7-1 and monitoring points and measured water levels are shown on Plate 7-1. It should be noted that the monitoring of these holes was done over the 2 3/4 year period to provide baseline data for the South Lease by I.P.A. Monitoring of water depths at these points by UtahAmerican commenced in December 2000 and

continued through present. As indicated by the data in Appendix 7-1, the water levels in the holes show very little fluctuation. Levels change from less than 1.2' to a maximum of 21.2' over an eight year monitoring period. Figure 7-2A and 7-2B present the seasonal fluctuations of the water levels as contour maps and hydrographs. Using these water levels, an estimate of the projected water level assuming that the zones from the individual piezometers are connected is shown on Plate 7-1 and the monitoring results are included in Appendix 7-1 - Baseline Monitoring.

The piezometers were installed to provide depth of water only. It is impossible to drop a bailer 1000 feet and withdraw a water sample without contaminating the sample. It has been suggested that sampling pumps be installed on these wells. Appendix 7-11 discusses the difficulties of using pumps and bailers in these piezometers. Due to limited pump capabilities in a 2-inch diameter well such sampling is not feasible. Therefore the depth and diameter of the piezometers holes make it impossible to use them for baseline quality sampling.

Drill holes S-26, S-27, S-28, and S-31 were cased in 3" PVC pipe with bottom perforations for water monitoring; however, cement seals were faulty, allowing the PVC pipe to fill with cement. Drill hole S-26 was reported dry in the week prior to cementing.

It has been reported by Kaiser that holes within one and one-quarter miles east of the cliff face were drilled with air, mist and foam and did not detect any water in the subsurface with the exception of drill hole S-32. No apparent increase in fluid level could be attributed to groundwater inflow from these holes, some of which were open for two weeks. Exploration drill holes in the South Lease property south of Williams Draw did not encounter groundwater within 1 to 1.25 miles of the coal outcrop. Exploration drill holes in the South Lease property, south of Williams Draw, did not encounter groundwater within 1 to 1.25 miles of the coal outcrop.

S-32 is located approximately three miles south of Lila Canyon and is separated from Lila by at least two known fault systems. The drill log along with the Chronology of Development and Pump tests are included in Appendix 6-1. Water levels measured are shown in the `"Chronology of Development". Water quality analysis for S-32 is also included in Appendix 6-1. These water quality data are representative of the completion zone of the well (Upper Sunnyside Coal Seam and zone beneath the coal). The location of S-32 is shown on Plate 7-1. The Permittee visited S-32 in 2002 and attempted to measure water levels, but found that piezometer S-32 was unusable.

Spring and Seep Data. JBR Consultants Group (1986) conducted a spring and seep inventory of the Horse Canyon area during the fall of 1985. During the study, no springs or seeps were located within the disturbed area or near the proposed surface facilities. Within and adjacent to the permit area, 19 springs and seeps were found. Flows occurred from either sandstone beds located over shales or from alluvium. The flow rates from the springs varied from less than 1 gpm to about 10 gpm. Table 7-1 shows the flow rates and field data for each site. Sample results are listed in Appendix 7-6.

Based on the data, nine of the springs occurred from alluvial deposits in the stream channels or in colluvium. Nine of the remaining springs discharge from sandstone located above less permeable shale. Spring (H-92) was developed by excavating into bedrock. The discharge from this spring is through a pipe.

An additional spring and seep survey was conducted in the area, including the proposed Lila Canyon Mine area, by EarthFax Engineering in 1993 through 1995. Results of this survey are included in Appendix 7-1 of this permit. This is the most consistent and most recent data; therefore, this data has been used for baseline monitoring in Appendix 7-1.

All of the spring and seep sites identified from the various surveys are presented on Plate 7-1A. The geologic source for the springs can be determined by comparing Plates 6-1 and 7-1 and 7-1A. Additionally, the elevation of the sampling points can be estimated from the topographic base map. All groundwater use (seeps and springs) within the permit and adjacent areas is confined to wildlife and stock watering.

It should be noted that a number of sample sites and monitoring holes have been noted in previous submittals. Sites A-26 and A-31 were mentioned in the Horse Canyon Mine Plan; however, these sites were drilled in 1981, and no data is available as to location and/or water quality data. These sites are considered non-usable for this plan. Sites H-21A, H-21B, H-18A, H-18B, HC-1A and an unidentified spring 1000' southwest of HCSW-2 have been mentioned; however, no sample data or pertinent information is available for these sites, and they have been removed from Plates 7-1 and 7-1A. Plates 7-1 and 7-1A have therefore been revised to show only seep/spring and other pertinent hydrologic data points for which adequate, reliable data is available for the plan.

Water rights for the mine and adjacent areas are addressed in Section 722.200 of this P.A.P.

Table 7-1
1985 Spring and Seep Survey Results

Spring ID	Temp (C°)	pH	Conduct. (umhos.)	Flow (gpm)	Occurrence	Use	Sampled
H-1	7	8.1	950	2	SS over Shale	wildlife	yes
H-2	10	8.0	1111	2	Colluvium	wildlife	no
H-3	-	-	-	<<1	Alluvium	wildlife	no
H-4	9	7.7	1229	1	Colluvium	wildlife	no
H-5	10.5	7.7	1359	1	Alluvium	wildlife	no
H-6	9	7.9	1366	10	SS over Shale	cattle	yes
H-7	9.5	7.6	1985	<1	SS	cattle	no
H-8	12	7.8	1997	<1	SS	wildlife	no
H-9	11	7.7	1919	2	Alluvial	cattle	no
H-10	11	7.9	2150	1	Alluvial	cattle	no
H-11	9.5	7.8	1227	2.5	Alluvium	cattle	no
H-13	11	7.1	1596	4.5	Colluvium	cattle	no
H-14	7	7.5	2040	2	SS over Shale	cattle	no
H-18	7	7.9	1381	9	Alluvium	wildlife	yes
H-19	8	8.2	645	3.5	SS over Shale	developed	no
H-20	14	8.3	777	2.5	SS over Shale	none	no
H-21	14	8.3	968	6	SS over Shale	wildlife	yes
H-22	5	8.3	322	1	SS over Shale	none	no
H-92	-	-	-	<<<1	SS over Shale	none	no

Mine Inflow Information. Based on the historic record, water was encountered underground in the Horse Canyon Mine, resulting in outflows from portal areas of approximately 0.2 cfs or 90 gpm. The size of the flows from pumping or from old portal discharges is more the result of the large size of the mine (approx. 1500 ac), rather than the result of intercepting a localized high flowing aquifer. If the flow is distributed over the mine area, the average inflow is about 0.6 gpm per acre. The water encountered was likely discharge from perched aquifers or saturated sandstone lenses encountered during mining, not uncommon in mines in the Blackhawk Formation.

According to mining records of U.S. Steel (previous owner), groundwater was monitored within the Horse Canyon mine in several locations. Generally, the underground flows occurred from roof drips or areas where entries encountered sandstone lenses. As discussed in the Blackhawk Formation description, the inflows were similar to inflows found in other mines along the Book Cliffs. This is thought to represent an interception of an isolated saturated zone in the subsurface. Generally, a saturated, perched sandstone lense which overlies the coal seam is intersected by the mining operation. This provides a flow path for the isolated water in the sandstone lense to drain into the mine. Over time as the volume of water in the sandstone lense decreases, the rate of discharge also decreases. Eventually, the inflow ceases as the available water in the lense is fully drained. This drying up of the inflow is indicative of a very limited recharge to the deep strata in area, which is consistent with the known horizontal and vertical hydraulic conductivity of the Blackhawk Formation.

Flows which issued from rock slopes and gob areas, where roof collapse may have occurred, were also small. These area would have exposed numerous points for inflow from sand stone lenses, roof bolts, and fractures within the formation. Therefore, it would be likely that if there were large amounts of water stored within the formation, the inflows from these area would have been significantly greater. The lack of these flows from these areas of the mine are a further indication that limited water was stored in the formation and that the recharge to the formation from overlying strata was also limited.

During the period from 1957 to 1962, an exploration test entry was mined south from the Geneva Mine into the Lila Canyon Area. This entry encountered in-place water, which was allowed to collect in short cuts made into the down dip entry which was sufficient to keep excess water from working areas. The exploration entry was terminated when the Entry fault was encountered (see Plate 7-1). More than two months was spent drilling

to ascertain the nature of the fault and locate the coal seam. During this period, there is no mention in the records of excess water or that water was encountered in the Entry fault area.

There is no estimate of water quality retrieved while mining the exploration entry other than mentioned above. However, water flow and seeps were reported to be in the range of 1 to 24 gpm.

Only when the mine neared the Sunnyside Fault was significant water encountered. The water was initially pumped for use in the water supply system for the mine. When inflows increased beyond in-mine needs, to keep the workings near the Sunnyside Fault from flooding, the mine pumped water collected from this area from the workings during the period 1980 through 1983, prior to suspending operations. The development plan for the mining within the Lila Canyon extension is planned to avoid the Sunnyside Fault. Therefore, the amount of water to be encountered underground will be limited.

The rate of inflow into the Horse Canyon Mine is not precisely known. In U.S. Steel's Permit Application Package (PAP) (1983) they estimated the average discharge from the mine to be 0.2 cfs. Lines and Plantz (1981, p. 32) also estimated the discharge from the mine to be 0.2 cfs and mentioned that the discharge was intermittent. It is not known, however, if this represents a constant average flow or the average flow rate during discharge periods. The mine was using an unknown volume of water within the mine for dust suppression and other operational needs.

According to the I.P.A. Mining and Reclamation Plan for Horse Canyon, Kaiser Coal re-entered the mine in 1986. They found that at the intersection of the Main Slope and 3rd level, at the rotary car dump, there was water in the bottom of the dump. The water level in the dump was described in the Horse Canyon P.A.P. as being "about 30 feet below the floor (personnel communication, 1990)". U.S. Steel monitoring site 2 Dip, a sump where water collected, is very near this location and has an elevation of 5,827 feet. Therefore, the water level in the rotary dump would be at a level of about 5,800 feet. No other water levels were obtained during 1986.

In 1993, BXG also re-entered the Horse Canyon Mine. They reported water levels at the rotary car dump at approximately 5870. It is not known if this reported level was for the same locations, but it is assumed to be the close to the same location. Due to the extended period without pumping, this water level is probably representative of the level of water collected in the rest of the mine. Therefore, to be conservative, it is assumed that the

Geneva exploration entries driven south from the Horse Canyon Mine into the proposed Lila Canyon mining area do contain water since the tunnels elevation is approximately 5855 feet.

The Horse Canyon Mine has been closed and the surface area reclaimed. With no significant inflow to the old workings, no discharges are occurring from any of the portal areas nor are expected in the future. It is known however, that water has collected in the old entries. As future mining activities, for the proposed Lila Canyon Mine, will be occurring near this area of collected water in the old exploration entry workings, it is likely that some of this water will be intercepted by the proposed Lila Canyon Mine (see Plate 7-1). Water may then have to be pumped from the mine. Because of undulating floor and unknown void areas, it is impossible to determine the amount of water that would be pumped. The rate of pumping, if any, would be determined by the water discharge system design. All water discharged from the mine would be discharged at UPDES Site # 002A which is Site L-5-G, and will meet all UPDES standards. DOGM has specified planning to include a mine discharge of 500 gpm maximum.

An inspection of the Horse Canyon area following mining has shown no diminution of reasonably foreseeable use of aquifers. Since mining ceased in 1983, subsidence should have occurred within two years. However, no deterioration of the aquifers in the area was identified. Mining has not yet begun on the Lila Canyon site; however, since the structure and groundwater regime is similar to the Horse Canyon area, no diminution or deterioration of groundwater resources is expected in this area.

As the mining in the Lila Canyon Mine will be from the same seam and the adjacent strata are the same and the over and underburden are the same, occurrences of ground water in the Lila Canyon Mine are expected to be similar to the Geneva Mine (Horse Canyon). The water quality is expected to be the same as the water encounter in the Horse Canyon Mine. Samples taken underground from the Horse Canyon Mine (MRP part “A” Appendix VI-1) to the north of the Lila Canyon Mine and from well S-32 (MRP part “B” Appendix 7-1) by Kaiser to the south of the Lila Canyon Mine show the water from the level of the coal seam to be a calcium, sodium-sulfate type water. Therefore, it is likely that the water from the strata between these two points from the same strata will be very similar.

Inflows of water encountered while mining are expected to reduce to seeps or dry up in a short period of time. If a significant water inflow is encountered, the water, which is not needed for underground operations, will be collected, treated as necessary, and pumped to the surface for discharge under the terms of the UPDES permit.

Groundwater Systems. In the Lila Canyon Lease area, the groundwater regime consists of two separate and distinct multilayered zones. The upper zone consists of the Wasatch Group which includes of the Colton Formation, the undifferentiated Flagstaff Limestone-North Horn Formation, and the Price River Formation. These formations contain groundwater in isolate, perched aquifers. These perched zones are classified as aquifers because they supply groundwater in sufficient quantities for a specific use (as specified by R645-100-200). The lower zone consists of the Blackhawk Formation (where the coal seams are located). This formation consist of low-permeable strata which contain groundwater in isolated saturated zones. Based on the definition in the State coal mine regulations (R645-100-200), there is no aquifer in the lower saturated zone, because the water is not developed for a specific use nor does the strata transmit sufficient water to supply water sources. Additionally, there is no discharge from this zone along any fault or fracture or in any adjacent canyons. The two zones are separated by the Castlegate Sandstone. This zone is a porous, fairly clean sandstone. According to Fisher, et.al. (1960), the Castlegate Sandstone does not have any shales, clays, siltstones, or mudstones. The lower zone is underlain by the Mancos Shale, a very impermeable marine shale.

Geologic conditions in the permit and adjacent areas are described in detail in Chapter 6 of this P.A.P. Though discussed in several publications for the general Book Cliffs area, formal aquifer names have not been applied to any groundwater system in the permit and adjacent areas because the geometry, continuity, boundary conditions, and flow paths of the groundwater systems in the area differ somewhat from the general published discussions. However, the data do suggest that groundwater systems in each of the bedrock groups are sufficiently different from each other to justify the informal designation of groundwater systems based on bedrock lithology. Thus, the informal designation of the Upper zone - Colton, Flagstaff/North Horn, and Price River and the Lower zone - Castlegate, Blackhawk, and Mancos groundwater systems is adopted herein.

The majority of groundwater in the permit and adjacent areas generally occurs within isolated, perched aquifers in the upper zone overlying the coal-bearing Blackhawk Formation. In the lower zone groundwater occurs in isolated saturated zones in the Blackhawk Formation. Hydrogeologic conditions within the permit and adjacent areas are summarized below:

Upper Groundwater Zone

Colton Formation. The Colton Formation outcrops in the northeast portion of the permit and adjacent areas. This formation consists predominantly of fine-grained calcareous sandstone with occasional basal beds of

conglomerates and interbeds of mudstone and siltstone. Data presented in Plates 7-1 and 7-1A and Appendices 7-1 and 7-6 indicate that 16 springs issue from the Colton Formation within the permit and adjacent areas. The elevations and location of these springs vary greatly within the formation, indicating that the springs are isolated from each other and that they are not part of one aquifer.

Waddell et al. (1986) evaluated the discharge of springs in the formation for the period of June to September 1980. The measured discharge rate generally declined during the 4-month period of evaluation. This suggests that the groundwater system has a good hydraulic connection with surface recharge and that most of the annual recharge quickly drains out of the system. The limited flow indicates that the recharge is limited to small areas above the spring and not to a deeper groundwater system.

Groundwater issuing from the Colton Formation has a total dissolved solids ("TDS") concentration of 300 to 600 mg/l (as measured by specific conductance and laboratory analyses of TDS). The pH of this water is slightly alkaline (7.5 to 8.1). Insufficient data are available to describe seasonal variations in these parameters.

The water is a calcium-magnesium-bicarbonate type (see Appendix 7-1). The data also indicated total iron concentrations of <0.04 to 4.89 mg/l. Total manganese concentrations ranged from <0.01 to 1.29 mg/l.

Undifferentiated Flagstaff-North Horn Formation. The Flagstaff-North Horn Formation outcrops across much of the northern and central portion of the permit area. This formation consists of an interbedded sequence of sandstone, mudstone, marlstone, and limestone. Most springs and a major portion of the volume of groundwater discharging from the permit and adjacent areas issue from the Flagstaff-North Horn Formation. According to Plates 7-1 and 7-1A and Appendices 7-1 and 7-6, 36 springs issue from the Flagstaff-North Horn Formation within the permit and adjacent areas.

Groundwater discharge rates for springs issuing from the Flagstaff-North Horn Formation are greatly influenced by seasonal variations in precipitation and snowmelt, with most discharge corresponding to the melting of the winter snow pack during the spring months. Discharge is highest following the spring snowmelt and decreases to a trickle by the fall (Appendices 7-1 and 7-6). Many springs issuing from the Flagstaff-North Horn Formation have been noted to dry up each year.

Waddell et al. (1986), found that most of the annual recharge to the Flagstaff-North Horn Formation drains out of the system within about two

months, while the remainder of the annual recharge drains out prior to the next snowmelt recharge event.

The groundwater regime in the Flagstaff-North Horn Formation appears to be influenced predominantly by the combined effects of lithology and topographic expression. Because the Flagstaff-North Horn Formation forms the upland plateau of the permit and adjacent areas, this formation is capable of receiving appreciable groundwater recharge from precipitation and snowmelt.

Waddell et al. (1986) concluded that the Flagstaff-North Horn groundwater system consists of isolated, perched water bearing lenses rather than a continuous perched aquifer. They indicate that approximately 9 percent of the average annual precipitation recharges the Flagstaff-North Horn groundwater system and that recharge water entering the Flagstaff-North Horn Formation moves downward until it encounters low permeability lenses of shale or claystone layers in the lower portion of the formation, where almost all of the water is forced to flow horizontally to springs.

Data presented in Appendices 7-1 and 7-6 indicate that groundwater issuing from the Flagstaff-North Horn Formation has a TDS concentration range of 400 to 700 mg/l. This water tends to be slightly alkaline and, similar to conditions encountered in the overlying Colton Formation, is of the calcium-magnesium-bicarbonate type.

The data presented in Appendices 7-1 and 7-6 indicate that the total iron concentration of groundwater discharging from springs in the Flagstaff-North Horn Formation is generally less than 0.04 to 0.15 mg/l. Total manganese concentrations in Flagstaff-North Horn groundwater are generally less than 0.03 mg/l. These data do not exhibit seasonal trends.

Price River Formation. The Price River Formation consists of interbedded mudstone and siltstone with some fine-grained sandstone and carbonaceous mudstone. Within the permit area, 17 springs have been found issuing from the Price River Formation as indicated based on data presented in Plates 7-1 and 7-1A and Appendices 7-1 and 7-6. Flows from these springs are limited in quantity and generally show a seasonal decrease with time, being high in the spring and reduce to very low or dry conditions in the summer. Such fluctuations indicate that these springs originate from limited recharge areas. Therefore, these springs are also part of a series of isolated, perched saturated zones or lenses and not part a regional aquifer system. Transmissivity in the Price River Formation is estimated by Waddell (1986) to be 0.07 ft^2/day or 0.00013 ft/day. Based on specific conductance measurements collected from these springs, the

TDS concentration of water issuing from the Price River Formation varies from about 750 to 850 mg/l. The water is slightly alkaline, with a pH of 7.9 to 8.9.

Lower Zone

Castlegate Sandstone. The Castlegate Sandstone consists of a fine- to medium-grained sandstone that is cemented with clay and calcium carbonate. The outcrops of this sandstone form prominent cliffs in the area. No springs were identified in this formation, suggesting that it is not a significant aquifer. The absence of springs is of great significance, since this formation is situated between the overlying Upper groundwater zone (in the Colton, Flagstaff/North Horn, and Price River Formations) and the underlying lower zone (in the Blackhawk Formation). This lack of springs indicates that there is separation between the upper and lower groundwater zones. Most likely this zone is the result of two factors: 1) clay horizons in overlying formations inhibit vertical recharge from groundwaters in the Flagstaff-North Horn Formations, and 2) the exposed recharge area of the Castlegate Sandstone is limited primarily to areas of steep cliff faces.

Blackhawk Formation. The Blackhawk Formation underlies the Castlegate Sandstone and consists of interbedded sandstone, siltstone, shale, and coal. The lower Sunnyside coal seam, to be mined by UtahAmerican, is located in the upper portion of the Blackhawk Formation.

Across the formation, with the exception of the Sunnyside Sandstone, most of the individual sandstone bodies are discontinuous. This results in areas that are saturated; i.e. sandstone lenses; and areas that are dry; i.e. siltstone and shale sections. This discontinuous nature results in the typical pattern found in the mines of the Wasatch Plateau and the Book Cliffs. For this upper portion of the Blackhawk Formation, no regional aquifer has been identified. As mining advances an isolated area of saturation (perched aquifer) is encountered by the entry or by roof bolting or fractures due to subsidence. As the water from these isolated saturated zone drains into the mine it starts at an initially high rate and over time as the limited extent of the zone is emptied, the rate of flow decreases. Some zones which are laterally connected are able to reach a consistent inflow which is a balance for the recharge to the system with the outflow to the mine entry.

The hydraulic conductivity of the lower zone is believed to be about 0.01 to 0.02 ft/day, similar to values reported by Lines (1985) from the Wasatch Plateau for similar lithologies. Structural dip in the Lila Canyon area is about 6 to 7 degrees to the east. The gradient of the lower zone in the Horse Canyon/Lila Canyon area is probably less than 2 degrees.

The IPA water level piezometers (Plate 7-1) were completed within the first formation with identifiable water below the coal seam, the Sunnyside Sandstone of the Blackhawk Formation. EarthFax Engineering supervised the drilling of the monitoring bore holes for IPA. In all three piezometers, immediately below the coal seam, a mudstone layer was encountered. Above the mudstone layer no significant water had been identified. Below the mudstone layer, a sharp transition to a sandstone layer was encountered. This sandstone layer was identified as the Sunnyside Sandstone. Water was identified as occurring from the sandstone layer in each of the piezometers. According to the EarthFax completion logs, the screened zones in the piezometers were located within the Sunnyside Sandstone layer and a cement-bentonite seal was placed from the top of the sandstone layer to the ground surface of the piezometer. Thus, the water level measured in the piezometers is indicative of the conditions found within the sandstone layer.

Data collected from the piezometers (Appendix 7-1) indicate that the water in the sandstone is under pressure. In IPA 1, the water level is approximately 590 feet above the completion zone. In IPA 2, the water level is about 810 feet above the screened level. While, IPA 3 has a water level approximately 250 feet above the completion level.

Additionally, water levels in IPA 2 and 3 varied by approximately 2 feet during the period of July 1994 through April 1996, but showed no consistent trend. IPA 1 showed a rise of 5.6 feet over the same period. Measurements collected in 2001 indicated that the water levels in IPA 2 and 3 were 1 to 2 feet higher than the last time it was measured nearly 5 years earlier, while IPA 1 showed a rise of 16 feet. For the period since 2001, no trend has been identified for IPA 2 and 3, while IPA 1 has continued a slow increase. Although an increase in water levels has occurred during the period of record, this increase is not considered significant.

As the piezometers are completed in the same saturated zone, the piezometric surface shows that groundwater in the Sunnyside Sandstone to be moving to the northeast, into the Book Cliffs (see Plate 7-1). The gradient of the piezometric surface is approximately 0.011 ft/ft. The seasonal fluctuations between fall and spring are almost undistinguishable. Based on the tabulated data (Appendix 7-1), the fluctuation range is less than 0.5 feet between summer and fall readings. Figures 7-1 and 7-2 attempt to show these variations in contour map and piezometer hydrographs.

The water level piezometers show water levels above the lower zone containing the coal seam in area of the mine. However, as reported in the

Castlegate Sandstone section, no springs or water bearing zones were identified in the spring and seep inventories or in the drilling of the water level piezometers in the formation. Therefore, indicating that the piezometer monitored zones are under pressure and that the water identified in the upper zone is perched and isolated from the lower groundwater zone.

While the water in the Sunnyside Sandstone is under pressure, there was no indication during drilling that the coal seam was saturated. Similar conditions have been identified in other mines in the Wasatch Plateau and the Book Cliffs. It is likely that the water within the Sunnyside Sandstone will not affect mining unless the confining mudstone layer is breached.

It is possible that mining will intercept some water as it progresses down dip. However, as discussed previously regarding mine water inflows to the Horse Canyon Mine, it is expected that water quantities and quality will be similar to that encountered in the Horse Canyon Mine. While some pumping is likely for water from the isolated saturated zones within the lower groundwater zone; since the water in the upper groundwater zone appears to be perched aquifers 200 to 500 feet above the coal seams, no adverse effects on usable surface sources are expected.

No springs have been identified as issuing from the Blackhawk Formation (see Appendices 7-1 and 7-6 and Plates 7-1 and 7-1A).

The quality of groundwater in the Blackhawk Formation is characterized by the water quality of data collected from inflows to the Horse Canyon Mine, which is completed in the lower portion of the Blackhawk Formation. Both mines will be completed in the same coal zone. Therefore, the quality of the water encountered in the Lila Expansion is expected to be similar to the water encountered in the Horse Canyon Mine. These data indicate that Blackhawk Formation groundwater has a mean TDS concentration range of 1400 to 2400 mg/l and is of the calcium, sodium-sulfate type. These waters are chemically distinct from groundwater in overlying groundwater systems.

Quality and quantity of underground water is the most difficult to ascertain due to geologic variables such as faults, fractures, channel sands and isolation of these particular features when water is encountered in order to gain reliable samples. Underground water tends to be co-mingled with water from other places in the mine and water pumped through the mines for mine equipment and dust suppression. Thus, care needs to be taken to obtain representative samples. Specific undisturbed water samples of the subsurface inflows are not known to have been collected. However, the

quality results reported in the Horse Canyon records are consistent with in-mine samples from adjacent mines.

The dissolved iron concentration of groundwater flowing into the Horse Canyon Mine has historically been less than 0.5 mg/l and is generally less than 0.1 mg/l (see Appendices 7-1 and 7-6). The total iron concentration of this water has historically been less than 0.7 mg/l and generally less than 0.1 mg/l. The total manganese concentration of Blackhawk Formation water (as measured in the Horse Canyon Mine) has historically been less than 0.05 mg/l and is typically less than 0.03 mg/l (see Appendices 7-1 and 7-6).

Mancos Shale. The Mancos Shale is exposed south and west of the permit area. This formation is a relatively impermeable marine shale and is not considered to be a regional or local aquifer. Groundwater samples collected from two monitoring sites located in Stinky Spring Canyon approximately 2 miles southeast of Lila Canyon Mine have a TDS concentration in the range of 2200 to 4200 mg/l and are of the sodium-sulfate-chloride type (Appendix 7-1). The flow rate for these two springs is less than 1 gpm, indicating the impermeable nature of the source formation. In the 1981 baseline study for the Kaiser Steel south lease permit document, Kaiser indicated that no springs were identified below the coal seam along the face of the Book Cliffs. Therefore, at that time, these springs were not flowing. Total iron concentrations ranged from 0.35 to 11.8 mg/l. Total manganese concentrations ranged from 0.05 to 0.29 mg/l. Chemical compositions of other parameters are consistent with waters from the Mancos Shale in the Book Cliffs area. The change in water type, from sodium-bicarbonate in the overlying Blackhawk Formation to sodium-sulfate-chloride in the Mancos, and the increased iron and manganese concentrations indicate that the Big and Little Stink spring waters are not from the same source, but are isolated waters from different recharge sources.

The two springs, which are located stratigraphically near the top of the Mancos Shale, appear to be fault related. As shown on Plate 7-1a, there is an east-west trending fault zone that is located within the canyon where Big and Little Stink Springs are located, referred to as the Central Graben. These two springs are located on the southern side of the northern fault of the graben. Due to the isolated nature of this graben block, being down dropped relative to the surrounding strata, within the highly impermeable Mancos Shale, it is unlikely that these springs are connected to any other water sources within the permit area. Further, the water quality and flow of these springs, as discussed above, also indicate an isolated nature of the waters. Based on these results, the waters from Big and Little Stinky Springs are considered are from a localized, isolated saturated zone, but not part of a regional aquifer or an extensive saturated zone.

Recharge and Discharge Relations

Recharge in the permit and adjacent areas occurs from precipitation to the exposed strata. Plate 7-1a shows the major zone of recharge. This recharge area corresponds to the outcrop and exposure of the Colton/Flagstaff-North Horn Formations. No perennial surface water streams or surface water bodies exist within the permit or adjacent areas which contribute water to the groundwater systems. The majority of infiltration is a near surface occurrence into the alluvial fills within the drainages. The deeper sediments underlying the drainages (Blackhawk and Mancos) consist of low transmissivity strata which would prohibit the vertical movement of groundwater.

Recharge rates were calculated by Waddell and others (1986, p. 43) for an area in the Book Cliffs. Waddell estimated recharge at about 9 percent of annual precipitation. Lines and others (1984) indicate the mean annual precipitation along the Book Cliffs in the area of the Horse Canyon Mines is about 12 inches, indicating a recharge rate of just over 1 inch per year.

The recharge and discharge areas for local isolated, perched aquifers in the upper zone (Colton, Flagstaff-North Horn and Price River Formations) generally lie within the drainage areas of Horse and Lila Canyons. These local systems are complex in that they are discontinuous and lenticular in nature and highly dependent on topography. Recharge water from precipitation or snowmelt enters the Colton or Flagstaff-North Horn Formations and moves downward until it encounters low permeability shale or claystone layers or lenses in the formations, where almost all of the water is forced to flow horizontally to springs. The springs exhibits substantial variability in discharge in response both to spring snowmelt events and to drought and wet years. Discharge rates as great as 20 gpm have been recorded from the springs during the high-flow season, and discharge rates as low as 1 gpm are not uncommon during late summer. The effects of the drought occurring in the late 1980s and early 1990s are clearly evident in the flow records.

Recharge to the lower zone including the Castlegate Sandstone, Blackhawk Formation, and Mancos Shale is of limited magnitude, due to the limited area of exposure of the formations to steep outcrops and the presence of low-permeability units in overlying North Horn and Price River Formations. Additionally, the clay layers in the upper Blackhawk, which contain approximately 80 percent clays, siltstones, mudstones, and shales, are all highly restrictive to vertical groundwater movement (Fisher and others, 1960). Further, no surface water bodies are present to act a supply sources to the deep ground water system.

Recharge to the lower zone probably occurs primarily from vertical movement of water through the overlying formations and is probably greatest where surface fractures intersect the topographic highs where the upper zone formations outcrop. The rate of recharge to the lower zone is very slow. The lack of a significant recharge source results in limited discharge areas. The largest portion of recharge to the lower zone is in the Castlegate Sandstone and upper member of the Blackhawk Formation with some leakage from the upper zone where the greatest number of springs are identified.

The Sunnyside fault zone is the major feature throughout much of the Sunnyside Mining District. Having a north-northwest strike, the fault zone extends from West Ridge to the Horse Canyon Mine. South of the Horse Canyon Mine the faults are not mapped at the surface. South of Horse Canyon, the faults are believed to be east of the Lila Canyon extension.

At the south end of the Lila Canyon Extension, a series of east-west trending faults have been mapped. These faults form the structure known as the Central Graben. The graben is a down dropped block relative to the adjacent strata.

Faults may effect flow, direction and magnitude of both lateral and vertical flows. However, the area is abundant with plastic or swelling clays that can seal faults and fractures inhibiting both lateral and vertical flows. As discussed in the mine inflow section, significant groundwater was only encountered in the Horse Canyon Mine as mining approached the Sunnyside fault zone. To prevent such inflows at the Lila Canyon extension, the mining plan attempts to avoid the fault zone. Also, exploratory mining by U.S. Steel, during the period 1952 to 1960, encountered the east-west trending Entry fault in the proposed Lila Canyon area. After extensive exploration, no significant water was encountered from the east-west trending fault.

Assuming mass-balance and stable hydrologic conditions, recharge will equal discharge over the long term. The relatively rapid groundwater discharge from the upper zone formations as compared with the underlying lower zone formations suggest that the stratigraphically-higher water discharges are local and are not hydraulically connected with the lower zone. Waddell et al. (1986) conclude that the perched nature of the upper zone formations protect them from the influence of dewatering of the coal-bearing zone unless the upper zone is influenced by subsidence.

Groundwater resources in the permit area are limited due to the small surface area and low recharge rates. There is not enough base flow from

groundwater discharge to maintain a perennial flow in Horse Canyon Creek or Lila Canyon.

The upper groundwater zone produces low volume spring flows from up-dip exposures of bedrock and overlying alluvium. Some spring discharges from this zone have been developed and are used for livestock and wildlife. The lower groundwater zone has very limited discharges that are used for wildlife, generally during the early spring. Based on the location of these lower zone points and the vertical separation (500 feet) between the coal seam and the points, there is no possibility of mining impacting the springs.

Due to the lenticular, discontinuous, and vertically separated water bearing zones in the upper zone, it is not possible to develop a potentiometric surface or to show water level variations within these discontinuous aquifers. As described above, the nature of the discharge from the springs with time has been identified. Also, it is not possible, due to the discontinuous nature, to map the extent of the upper water bearing zones.

724.200 Regional Surface Water Resources. The permit area exists entirely within the Horse Canyon, Lila Canyon, and Little Park Wash watersheds. The regional drainage patterns are generally north-south with steep canyons which are incised in the Book Cliffs escarpment. Stream flows within the region, generally, are the result of snowmelt runoff or summer thunderstorms. Water is not abundant as evapotranspiration exceeds precipitation.

Permit Area Surface Water Resources

Within the permit area, the surface water resources consist of three main drainages: Horse Canyon Creek, Little Park Wash, and Lila Canyon. Horse Canyon flows to Icelander Wash which, in turn, flows to Grassy Trail Creek and the Price River. Little Park Wash flows southward to Trail Canyon and the Price River. Lila Canyon flows southwest to Grassy Wash, then south to the Marsh Flat Wash and the Price River (see Plate 7-1).

Surface water sampling data are available in Appendix 7-2 and in the DOGM electronic database. The data were obtained from multiple sources, including (but not limited to) on-site sampling efforts, the Horse Canyon Mine P.A.P. filed by Geneva Steel and annual reports, U.S. Geological Survey publications, and various consultant reports. Since not all monitoring parties were required to adhere to UDOGM or SMCRA rules, the laboratory parameters varied between reports. However, the data are still considered valid and appropriate for determining baseline conditions within the permit and adjacent areas. The location of the sampling points are presented on Plates 7-1 and 7-1A.

Based on field observations (described in Appendix 7-7) and flow data obtained during the collection of water-quality samples within the permit and adjacent areas, Horse Canyon Creek is considered intermittent by rule with ephemeral flow within the permit area. Lila Canyon and Little Park Wash, based on the size of the drainage area (greater than 1 sq. mi.), are defined by regulation as intermittent but have been shown to be intermittent by rule with ephemeral flow (see Appendix 7-7). Several smaller tributaries of these streams within the permit and adjacent areas are ephemeral by flow pattern and by rule.

Horse Canyon, Little Park and Lila Canyon flow during the spring snowmelt runoff period and also as a result of isolated summer thunderstorms. Due to the limited drainage area and elevation of Lila Canyon, the duration of the snowmelt flows is quite short and is limited to the very early spring. Flows in Horse Canyon, generally, are limited to the early spring period (Lines and Plantz, 1981). By mid to late spring, usually no flow is evident in Horse Canyon Creek, below the minesite or Lila Canyon.

Over the period of record, 1981 through present, there have been both wet and dry periods. From 1983 through 1984, the area had high precipitation. In the late 1990's through the present, a drought has been evident in the area. Over this period of record, the flows in the streams have increased and decreased based on the available water. Also, during both of these periods, flows in Horse Canyon Creek during the summer and fall are generally not evident below the mine site. Only flows from summer thunderstorms upstream of the site have resulted in flows below the mine. This indicates that while surface water resources may fluctuate, the fluctuations are not great enough to change the response of the stream to overcome the hydraulic and geologic characteristics of the area.

During most years, the snowmelt peak is the highest peak flow for the drainages. Under certain circumstances, when a significant summer thunderstorm occurs over the drainages, the runoff event can be quite large. In the area of the springs, there are sections with continuous flow, where the channel has cut into the perching layer of the spring. The flows from the springs continue a short distance downstream of the spring location; however, there is no base flow contribution within the channel itself. The only flow is a result of the spring discharge and this is absorbed by the channel fill indicating a losing stream reach. There are no indications that any other reaches of Lila Canyon or Little Park Wash are perennial. Since the spring of 2000, both areas have been observed numerous times (at least quarterly) and no flow has even been noted in either drainage. Normally, this would indicate an ephemeral drainage, however, since the

drainage areas are greater than one square mile and exhibit no consistent flows, they are classified by regulation as intermittent.

The ephemeral nature of the streams make it difficult to document the high and low flow periods. Generally, the seasonal flow pattern for the drainages consists of dry channels until a thunderstorm or rapid snowmelt occurs. Then there is a short duration of flow within a portion of the channel. Following the passing of the storm or melting of the snow the runoff quickly decreases and the channel is again dry until the next event.

Such an event was documented in March 05 near the monitoring station L-11-G reported in the DOGM database 05/06/05. This was flow from a snowmelt event. An attempt was made to get to the monitoring point, but the access to the site was inaccessible due to deep snow across the road up Lila Canyon. Access was available only a short distance (couple of hundred feet above the Horse Canyon Access road). A water sample was taken at the upper most point that could be accessed. This was an area that typically would have been dry with no flow. The flow recorded was 7.5 gpm and a water quality sample was taken. The data are presented in the DOGM database.

A number of perched springs do exist in the tributaries of the upper reaches of the Little Park Wash drainage; however, the flows from the springs dry-up or infiltrate into the alluvial fill of the canyons within 50 to 200 feet of the source, before reaching the main drainage channel. The springs and seeps in the area have been sampled, as indicated in this application, as part of the baseline and spring/seep inventories. Therefore, they provide an estimate of the quality of the flow within the drainages.

Precipitation in the area generally consists of either high-intensity, localized thunderstorms or area wide, frontal storms. Table 7-1A presents rainfall-runoff model simulation results of both the 6-hour and 24-hour rainfall events of the drainages in the site area, to simulate each kind of storm. Appendix 7-10, Figure 1 presents the location of the drainages for the simulation results in Table 7-1A. Appendix 7-10 also presents the simulation calculation results. These peak flow results show that for short duration events with small return periods (5 years or less), there is little or no runoff from the watersheds. Additionally, due to the localized character of the thunderstorms, the storms affect only a part of the watershed and the limited runoff that does occur is lost to channel losses (infiltration, evaporation, transpiration) within the portion of the watershed that is not affected by the rainfall event. As the return period of the storm increases, storms have greater intensity and tend to cover larger areas, which likely affects most if not all of the watershed. Therefore, flows tend to increase.

Intense rainfall may cause heavy flooding, but likely only affect small areas and do not result in large volumes of runoff.

For the long duration, frontal type storms, the entire watershed is covered for each event. The frontal precipitation events tend to produce only limited amounts of flow in the local ephemeral washes for the short return periods. With the increase in the return period, the flow events tend to be larger. This is due to the contribution from the entire watershed.

Each flow event in an ephemeral channel is separate and distinct. The stream flow is directly proportional to the amount of precipitation or snow-melt runoff, and the water quality varies greatly depending on the amount of flow. The duration of these runoff events is generally short. For thunderstorm events, the flow is generally less than a few hours. Duration of runoff from the frontal runoff events is moderate in length, generally on the order of 11 to 14 hours. Based on the end of rainfall from the watershed model simulations, the runoff would generally end within 3 to 5 hours. Therefore, if a sampler were not on-site during the event, it is unlikely that any flow would be observed.

Table 7-1A

PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA

Watershed ID	Return Period	2yr (cfs)	5yr (cfs)	10yr (cfs)	25yr (cfs)	50yr (cfs)	100yr (cfs)
	6 hr	0	0	1.39	5.54	9.98	17.18
WS1.1	24 hr	0.65	3.22	9.31	22.68	39.50	59.77
	6 hr	0	0	1.21	6.43	12.77	22.18
WS1.2	24 hr	0.86	3.82	9.45	20.66	33.99	49.70
	6 hr	0	0	2.37	11.78	22.68	38.79
WS1 Total	24 hr	1.50	6.62	16.96	39.59	67.46	100.70
	6 hr	0	0	2.23	10.43	19.63	33.75
WS7 Total	24 hr	1.29	6.04	15.85	36.15	60.94	90.24

Table 7-1A

PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA

Watershed ID	Return Period	2yr (cfs)	5yr (cfs)	10yr (cfs)	25yr (cfs)	50yr (cfs)	100yr (cfs)
WS8 Total	6 hr	0	0	0.85	3.60	6.59	11.34
	24 hr	0.43	2.09	5.76	13.64	23.46	35.09
WS9 Total	6 hr	0	0	3.46	16.17	30.46	52.36
	24 hr	2.01	9.38	24.59	56.08	94.53	139.99

Table 7-1A

PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA

Little Park 6.1	6 hr	0	0	1.63	6.48	11.66	20.08
	24 hr	0.76	3.76	10.88	26.5	46.16	69.84
Little Park 6.2	6 hr	0	0	0.93	3.70	6.66	11.47
	24 hr	0.44	2.15	6.21	15.14	26.36	39.89
Little Park 6 Cumulative	6 hr	0	0	2.56	10.18	18.33	31.54
	24 hr	1.20	5.91	17.09	41.63	72.52	109.74
Little Park 6.3	6 hr	0	0	0.32	1.21	2.15	3.70
	24 hr	0.14	0.70	2.17	5.47	9.75	14.92
Little Park 5.1	6 hr	0	0	0.31	1.00	1.73	2.93
	24 hr	0.11	0.59	2.41	7.85	15.16	23.59
Little Park 5.2	6 hr	0	0	0.73	2.75	4.87	8.38
	24 hr	0.32	1.59	4.92	12.40	22.10	33.82
Little Park 5 Cumulative	6 hr	0	0	2.82	11.34	20.41	35.22
	24 hr	1.77	8.54	24.80	61.16	107.32	163.42
Little Park 4.1	6 hr	0	0	0.75	2.58	4.47	7.65
	24 hr	0.29	1.49	5.31	14.72	28.04	43.72
Little Park 4.2	6 hr	0	0	0.76	3.01	5.42	9.33
	24 hr	0.36	1.75	5.06	12.32	21.46	32.47
Little Park 6.4	6 hr	0	0	0.23	0.86	1.53	2.64
	24 hr	0.10	0.50	1.55	3.90	6.95	10.64

Table 7-1A

PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA

Little Park 6.5	6 hr	0	0	0.90	3.58	6.45	11.10
	24 hr	0.42	2.08	6.02	14.66	25.53	38.63
Little Park 4 Cumulative	6 hr	0	0	6.17	24.81	44.74	77.12
	24 hr	2.93	14.01	40.73	101.08	178.91	269.04
Little Park 6.6	6 hr	0	0	0.87	4.44	8.64	14.92
	24 hr	0.58	2.60	6.58	14.58	24.18	35.52
Little Park 3.1	6 hr	0	0	2.35	8.86	15.72	27.03
	24 hr	1.03	5.13	15.87	40.00	71.27	109.07
Little Park 3.2	6 hr	0	0	1.00	4.65	8.76	15.07
	24 hr	0.58	2.70	7.08	16.14	27.20	40.29
Little Park 3 Cumulative	6 hr	0	0	9.73	42.29	77.65	133.01
	24 hr	5.08	23.46	65.66	162.22	284.24	430.10
Little Park 6.7	6 hr	0	0	0.76	4.53	9.00	15.63
	24 hr	0.60	2.69	6.66	14.57	23.96	35.04
Little Park 2.1	6 hr	0	0	0	1.84	4.30	7.79
	24 hr	0.17	0.81	2.54	7.96	14.23	24.90
Little Park 2.2	6 hr	0	0	0.64	3.68	7.15	12.35
	24 hr	0.48	2.16	5.45	12.07	20.02	29.40

Table 7-1A

PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA

Little Park 2 Cumulative	6 hr	0	0	11.07	54.40	100.57	168.92
	24 hr	6.59	29.31	80.68	192.12	329.11	493.91
Little Park Total	6 hr	0	0	11.56	58.64	110.02	183.99
	24 hr	7.24	31.45	84.30	199.12	340.37	508.74

To determine the extent of the protection of these runoff waters, the downstream state appropriated waters were evaluated. As listed in Table 7-2 and shown on Plate 7-3, the downstream water rights are held by the BLM and consist of 91-2617, -2618, -2619, -2620, -2621, -2646, -2665, -4516, -4646, -4648, and -4649. As reported in Table 7-2, most of these rights have no flow and no use associated with them. According to the State Engineers web site, these rights have not yet been evaluated to determine if there is sufficient water to meet the right. Many of these rights are located on the stream and some are for stock ponds to be located off stream. However, in reviewing these locations, except for 91-2621, no stock ponds have been located in these areas. The BLM pond located at the location of water right 91-2621 had some improvement work conducted in 2004 (see Appendix 7-9). However, the BLM was not involved in the pond improvements. Recent site investigation shows that the diversion structure described in Appendix 7-9 has been breached and no flow now reaches the pond from Grassy Wash.

There are two water rights for isolated stock ponds in the head waters of Stinky Spring Canyon, 91-4648 for Dryden Reservoir located in the SE/4, SW/4, Section 14, T16S, R14E and 91-4649 for Sams Pond located in the NW/4, NE/4, Section 23, T16S, R14E (see Plates 7-1 and 7-3). Both of the water rights are owned by the BLM and have a maximum capacity of 3 ac-ft. No records have been found that these ponds were constructed. Based on the maximum capacity of the ponds, it is expected that these ponds would be about one half acre in size, assuming a depth of 5 feet. Field inspection of the quarter sections found no ponds along the ephemeral drainages and review of aerial photos of the area also did not reveal any ponds in the area. Based on the locations for the water rights, the area for water right 91-4648 is shown in a photograph presented in Attachment 1 of

Appendix 7-7 (Photo 93). As can be seen, there is no stock pond in this area. The area for water right 91-4649 is shown in photographs taken in the area (see Figure 7-5) indicated in the water right of the pond. No pond has been found. The only thing found in the designated area is an area of grass in the pinyon juniper.

Based on water rights flow values and the lack of a specified use, it is assumed that the State Engineer and the BLM had planned to develop range improvements in the area, but the lack of water made this effort unsuccessful. Given the lack of use for these downstream channels, it does not appear that a significant concern exists for the downstream waters.

Surface waters in this part of the Book Cliffs drain to the Price River. The Price River flows to the Green River which, in turn, flows to the Colorado River. It is anticipated that only during extremely long duration, high-intensity thunderstorms that flow from the ephemeral and intermittent drainages within the permit area would reach the Price River. Due to the length of channel and the limited volume of runoff, the majority of flow is lost to channel losses, as indicated in Appendix 7-9.

Lines and Plantz (1981) conducted three seepage surveys of Horse Canyon Creek in 1978 and 1979. The results of the surveys show no consistent trends through time. Mine discharges created difficulties in interpretation of the data because there was no indication of whether the mine was or was not discharging water at the time of the surveys. However, Horse Canyon Creek below the mine is a losing stream, due to the visual observation of low flows decreasing downstream of the mine (professional observations, Thomas Suchoski, 1979-1980 & 1984-86). Flow in the channel adjacent to the mine facility entry portal on several occasions during mine inspections during the spring period were approximately 4 to 6 inches deep, with a flow width of 15 to 20 feet. Downstream of the mine in the area of the roadside refuse pile, the flow would be 2 to 3 inches deep with a flow width of 10 to 12 feet. Channel slopes in both areas were similar. No diversions are present along this reach of the channel to reduce the flow. Therefore, the channel flow decrease is the result of infiltration and evaporation of the water within the channel.

The Lila Canyon drainage is normally dry, flowing only in response to precipitation runoff or rapid snowmelt. The mine facilities will be located in the Right Fork of Lila Canyon.

In January 2004, an assessment of the geomorphic character of the Lila Canyon channel, downstream of the proposed mine site, was conducted to address DOGM comments. A series of channel cross-section

measurements were taken and the bed and bank materials visually observed. During this evaluation, it was discovered that a diversion structure had been installed just above the confluence of the Right Fork of Lila Canyon and Grassy Wash (see Appendix 7-9 and Figure 7-3). This diversion structure diverted all flow from the drainage and conveyed it by diversion channel to a stock pond located in the SW/4, SW/4 of Section 28, T. 16 S., R. 14 E. Subsequently, it was thought that the improvements were part of a BLM range improvement project. This structure significantly modified the drainage pattern for this area. Flows that previously would have flowed into Grassy Wash would now be detained in the stock pond. However, in discussions with BLM personnel, it was discovered that the BLM was not involved in the pond improvements. Recent site investigation shows that the diversion structure described in Appendix 7-9 has been breached and no flow now reaches the pond from Grassy Wash.

The closest perennial stream to the permit area is Range Creek. The drainage is located approximately 6 miles east of the proposed Lila Canyon permit area boundary (see Plate 7-1a).

Range Creek is in a broad, south-southeast oriented drainage that has been eroded into the Roan Cliffs. A western extension of the Roan Cliffs (Patmos Ridge) lies between Range Creek and the Book Cliffs. The proposed Lila Canyon operation is on the west side of Patmos Ridge. The Colton Formation is exposed at the surface from Patmos Ridge east to the main body of the Roan Cliffs, and between these two escarpments Range Creek has eroded into but not through the Colton Formation. Approximately eleven miles southeast of the permit area, just upstream of Turtle Canyon, Range Creek has eroded through the Colton, Flagstaff, and North Horn Formations, but it reaches the Green River without having eroded through the Upper Price River Formation. The nearest Blackhawk outcrop is 10 miles further south, along the Price River.

Argument has been made that Range Creek receives recharge from a regional aquifer which is likely from the lower saturated zone that the Lila Canyon Mine will be mining or that the overlying perched upper zone might be drained by the mining activities and affect the flows contributing to and in Range Creek.

To address these concerns, the following issues were evaluated. An evaluation of the elevation difference between the saturated ground-water zone in the Blackhawk Formation and stream flows in the Range Creek drainage was conducted, especially for the reaches nearest the permit area. Also, the thickness and composition of the strata between the coal seam and the creek was conducted. Further, the potential for diminishment of spring and tributary flows to the Range Creek drainage resulting from

subsidence impacts within the recharge area to the overlying strata was evaluated.

If the deeper ground water in the Blackhawk Formation were to flow following either the gradient indicated by the piezometers (see Figure 7-1) or geologic dip (see Plate 7-1B), the water would flow well below Range Creek (800 to 1,200 feet) in the reaches nearest the Lila Canyon Mine and for many miles downstream.

Additionally, the thick section of strata between Range Creek and the Blackhawk Formation would impede hydraulic interaction between any deep ground water and the surface (Plates 7-1A and 7-1B). It is estimated that the vertical separation between the Blackhawk and Range Creek at the base of the Colton would be about 1,200 feet.

A review of U.S. Geological Professional Paper by D.J. Fisher, C.E. Reeside and J.B. Erdman, 1960, **Cretaceous and Tertiary Formation of the Book Cliffs, Carbon and Emery Counties, Utah,** which evaluates the composite stratigraphy in the Horse Canyon area, was conducted. The lithology descriptions were reviewed and a total of the percentage of shale, siltstone and mudstone (less permeable layers), for each strata identified by the authors, was generated to get an idea of the ability of each strata to restrict flow throughout the stratigraphic column.

Colton Formation		
Upper Sandstone Unit	1,300 ft.	
% Shale		23.1
Shale Unit	960 ft.	
% Mudstone		82.9
Lower Sandstone Unit	1,128 ft.	
% Shale and Mudstone		34.8
North Horn–Flagstaff, Undifferentiated		
Shale beds	237 ft.	
Mudstone	181 ft.	
Limestone	21 ft.	
Siltstone	25 ft.	
Clay	7 ft.	
Sandstone beds	99 ft.	
%Shale, Clay, Siltstone, and Mudstone		79.0
Price River Formation		
Upper Unit	299 ft.	

% Shale		43.8
Lower Unit	234 ft.	
% Shale and Siltstone		43.8
Castlegate Sandstone	160 ft.	
% Shales, Clays, Siltstones or Mudstones		0
Blackhawk Formation		
Upper Shale Unit	170 ft.	
Middle Sandstone Unit	0 ft.	
Middle Shale Unit	102 ft.	
Lower Sandstone Unit	200 ft.	
% Shale		52.5

Based on the stratigraphic column in the area, the overall percentage of less permeable strata is 47 percent. Looking at the distribution of the less permeable strata, the majority is in the upper lithographic units. The Colton and North Horn-Flagstaff contain about 1940 feet of less permeable units, while the Price River and Blackhawk contain about 480 feet. Therefore, there is little potential for water to move vertically between the upper and lower zones. The main direction of water movement will be horizontally within the strata.

Further, the elevation of Range Creek in the area of concern ranges from 6890 to 5740 feet (see Plate 7-1A). The coal seam exposure along the Book Cliffs ranges from 5,500 to 6,000 feet. Therefore, for water to flow from the coal seam to Range Creek the flow would need to overcome a hydraulic head difference of 200 plus feet, just based on the initial elevation and not accounting for dip of the formations. There is insufficient head and no source of water to provide the driving head for such conditions.

In regard to subsidence affecting the potential recharge to the springs and tributaries to Range Creek, as described in Chapter 5, Section 525, the subsidence limits from the proposed mining are required to be limited to the area of the permit boundary. Therefore, the recharge area to Range Creek that the mine might affect is limited to that portion of the recharge area within the permit boundary.

To determine the recharge area to Range Creek, a review of the relationship of the proposed permit area, location of Range Creek and the geology in the area, as shown on Plate 7-1A, in the reach nearest to the proposed mine, was conducted. As is evident on Plate 7-1A, the Little Park drainage has eroded through the Colton and North Horn Formations and into the Price River Formation, while the Range Creek drainage has not eroded

through the Colton Formation. Based on this and the previous discussion of the high percentage of low permeable strata within the Lower Colton and North Horn-Flagstaff formations, there is limited potential for recharge to the springs and tributaries from areas below the bottom of the Colton Formation. Figure 7-3 presents a representation of the likely method of recharge to these springs. The potential impact area from the mine is, therefore, that portion of the permit area that is east of the Horse Canyon and Little Park drainages which is above the Colton-North Horn-Flagstaff contact within the area of maximum subsidence.

Based on a projection of the direction of dip (N68^{o}E), the recharge area of the Range Creek drainage that might be affected by the mine would be from just north of Little Horse Canyon south to Cherry Meadow Canyon. Figure 7-4 presents a localized view of this area with recharge potential along the west side of the Range Creek drainage. The total recharge area to this portion of the Range Creek drainage is approximately 18,150 acres.

Based on a review of Figure 7-4, the portion of the permit boundary that meets the potential impact area criteria is approximately 183 acres. Therefore, the percentage of the recharge area that might be intercepted by catastrophic subsidence is 1.0 percent. As catastrophic subsidence is unlikely due to the cover over the coal seam for most of this area (2,000ft +) (see Figure 7-4), this percentage is conservatively high. Such a small percentage would not be measurable within the Range Creek drainage.

If such an occurrence were to happen, based on the hydraulic conductivity (0.1gpd/ft^2) and porosity (0.25) of the formation and the anticipated gradient (0.1ft/ft), the average linear velocity of flow through the formation would be about 0.006ft/day. This results in an estimated duration, for the reduced recharge to move laterally through the Colton Formation and reach the Range Creek drainage, to be about 8,700 to 11,300 years.

As a result of the five to six miles horizontal distance from proposed permit area to Range Creek (see Plate 7-1a) and the isolating effects of the over 1,000 feet of low-permeability, isolating strata between the coal seam and the creek elevation (see Plate 7-1B and Table above) and the limited potential impact of subsidence damage to the recharge area, it is not likely that the Lila Canyon Mine will adversely affect Range Creek. Due to these conditions, no baseline or other sampling has been gathered nor is anticipated on Range Creek.

Additional concerns have been raised regarding the potential impact that water extracted from the Blackhawk Formation as a result of the mining activities would have on the downstream drainages, specifically the Price

and Green Rivers. Initial evaluation indicates that the distance within the Blackhawk Formation between the mine and the Price River is over 12 miles. This distance alone would preclude any significant impact.

As further evidence, as discussed in Appendix 7-3, it is difficult to determine the amount of water that will be extracted by the mining activities. For design purposes, DOGM has required that a value of 500 gpm be used. This is thought to be very conservative. If this volume were extracted, the yearly total would be about 800 ac-ft per year. As there are no significant springs that discharge from the Blackhawk Formation, the loss of this flow would be minimal. Also, as discussed in Appendix 7-3, the addition or loss of this flow would result in a 0.9% flow change to the Price River and a 0.02% flow change to the Green River. In both cases, this flow change would be less than could be measured by standard methods.

The Horse Canyon drainage is monitored in accordance with the approved monitoring plan for the permit. There has been only one sample taken in the Lila Canyon and no samples taken in Little Park Wash because only limited flow has been observed during the monitoring activities. Factors that contribute to the lack of data are: accessibility to the sites during the winter period and immediately after summer rain storm events is generally not possible, due to safety issues and a physical lack of flow. Concerns have been raised that evidence of flow has been seen in the drainages over the course of the year, therefore, why hasn't a water quality sample been collected. The following sections address the concerns of access and safety, physical lack of flow, and monitoring methods.

Access and Safety. Safety issues have hampered field work on several projects in the area. When the soils in the area get wet from a light rain, that would not generate a flow event, they become very slick and pose access and safety issues. During the IPA drilling, EarthFax had significant difficulty in getting equipment and vehicles up and down the access road following several small rain storms. In one case, they had one of their vehicles slide into the embankment rocks along the Horse Canyon access road (drop in the area was about 400 feet).

In the conditions of heavier rains, access during rainstorms through the channels in the area is dangerous. During the avian study for the Westridge mine, Mel Coonrod (EIS) and Frank Howe (DWR) were caught in a channel during a rainstorm and lost their vehicle to flooding. This occurred on Nine Mile Creek at the Dry Canyon crossing in March or April of 2000. Conditions in these drainages are similar to drainages within the Lila Canyon Permit Area.

During winter and early spring periods, there have been times when the access road has been blocked with several feet of snow making access with the field equipment impossible.

ECCR's position is that collection of environmental data is not worth of the loss of life or limb. Therefore, when the conditions are unsafe, the site is labeled inaccessible. At all other times, the sites are visited and if no flow is encountered it is reported as such.

Physical Lack of Flow. The lack of flow data in the sampling effort is not a failure of the sampling effort. The lack of flow at these sample sites is data which documents the normal conditions in the site area. If the streams were flowing 50 percent of the time, it is likely that the sampling efforts would encounter flow on an infrequent basis. However, if the flow for the short return periods is extremely small or none existence, it will be difficult to obtain and provide samples of these events. This lack of flow shows that the drainages do not have a base flow component and there is no regional aquifer discharging to the deeply incised canyons and drainages in the area. The sequence of sampling efforts have demonstrated further, that there are no long-term flow events occurring in the mine permit area or adjacent areas. Also, spring photographs show disturbances in the stream channels from the previous fall period sampling efforts, indicating that for some years no flow occurred from the fall to spring measurement events. Additionally, the peak flow simulation results presented in Table 7-1A show that for small return periods, 2 to 5 year events, runoff flows are not expected and that the duration of any flow events would be of extremely limited duration.

Therefore, a pattern has been identified of a set of drainages that only flow in direct response to precipitation or rapid snow melt. The flow events are localized, sporadic events with no consistent sequence and timing and are extremely limited in duration. For ephemeral drainages in the area, these are the variations and distributions in flow that can be expected and are seen at other mines. Under the definitions in the rules, the seasonal variation would then be the isolated snowmelt in various reaches of the channels in the spring period, and the isolated peak flow from a thunder storm that would have enough intensity to result in a runoff event. Based on the runoff simulations in Table 7-1A, for the larger precipitation events, the flows can be significant.

U.S. Steel conducted water quality monitoring of the Horse Canyon drainage. These monitoring efforts were conducted prior to the development of DOGM's present Water Monitoring Guidelines, and as a result the data is quite limited. The most recent results of these water monitoring efforts are presented in Appendix 7-2 and historic results are included in the DOGM electronic database.

The data collected from Horse Canyon follows the same pattern documented by Waddell, et.al. (1986). The pattern shows that the TDS concentrations for surface waters on the lower Blackhawk and out onto the Mancos Shale range from 1000 mg/l and increase to 2,000 to 2,500 mg/l. Additionally, the highest concentrations of suspended sediment will occur during high-intensity runoff from thunderstorms, and the lowest concentrations will occur during low flow or snow melt events.

Therefore, because of the similarity of the water quality data, the water quality expected from the drainages in the area of the proposed mine will be similar to the water quality found in the Horse Canyon drainage.

Monitoring Methods. Monitoring efforts did not include remote or automatic sampling efforts because of inherent problems attempting to implement these methods for this application. It has been suggested that crest-staff gauges, single-stage samplers, ISCO instruments, etc. could be used to collect samples. These are methods that the USGS uses for developed remote sampling sites. However, none of the ECCR sampling sites are developed. In the case of crest gauges, for these methods to be reliable and feasible, the sites need to be developed with concrete or bedrock lined channel sections. For the channel configurations at the ECCR sites, the channel bottoms generally consist of movable beds. These are channels that change configuration from storm to storm. As a result of channel erosion and deposition, the stage discharge relationship of the channel changes with each storm event. Therefore, while the crest gauge would indicate that a flow event may have occurred, the ability to determine what the flow rate was is greatly compromised. To be able to overcome this, it would be necessary to construct lined channel sections in remote channel areas. In some cases, this would require the construction of access ways and cement trucks to haul in the materials necessary. This would likely cause more damage than it is worth.

Single stage and automatic samplers have problems with holding time on many water samples being exceeded, routine clogging of the inlets to the sampler, and acceptability or reliability of the data. Holding time exceedance would occur when a storm event occurred immediately after a prior sampling visit and resulted in a sample being collected. As a result, the sample would remain in an unpreserved and unrefrigerated state for the duration of the period until the site was next visited. In the hot summer conditions, common in the area, the water quality of unpreserved and unrefrigerated samples would not be representative of the water in the drainage during the flow event. Changes to water quality parameters would be expected with changes in temperature of the sample, concentration due

to evaporation of the sample, and extended contact of the water with the sediment collected in the sample bottle. Therefore, for the majority of parameters in the monitoring guidance list, the water quality data would not be usable for determining the baseline or impact conditions.

Maintenance problems have been common problems with the use of remote samplers. Generally, these samplers work fairly well in perennial sampling environments. However, in ephemeral environments where the flows tend to be “flashy” - short duration events which carry a heavy sediment and debris load, these samplers encounter significant problems with plugging of the inlets or sampler damage or destruction.

The use of stage or automatic samplers on ephemeral streams does not meet the USGS sampling protocols and are not a depth integrated sample. According to the Shelton (1994), there are no protocols for adequately sampling an ephemeral stream and ephemeral streams are not included in the national water-quality assessment program. Australian water quality monitoring guidelines suggest that automatic samplers are not appropriate for sampling parameters that change with time (A-NZECC, 2000). ADOT (2005) removed all automatic samplers from there monitoring program. Only grab samples are allowed and ADOT will not accept any data collected by any automatic samplers. Recent information provided to ADOT indicates that automatic samplers are unreliable and impractical in arid climate conditions in Arizona. As the conditions in the arid climate in Southeastern Utah are similar to the Arizona conditions, similar difficulties and problems will be encountered and the data will have the same difficulties.

Several samplers were installed as part of the Westridge Mine sampling efforts. The samplers have problems with plugging and malfunctions on a regular basis and need constant maintenance. They are still in use, because they were required, however, the data are of limited value (Karla Knoop, personal communication, 2006). Single stage and automatic samplers were also installed as part of the Smoky Hollow baseline data collection efforts. Similar maintenance and malfunction problems were identified as part of the Smoky Hollow sampling efforts (Richard White, personal communication, 2006). Radio Frequency telemetry (RF) sensing equipment has also been considered. However, as most of the monitoring sensors require line of sight and these sites are in remote, incised canyons or drainages, that was not considered a viable option.

As a result of these difficulties, it was determined that these methods would not provide any better data than was already being collected. The concerns regarding erroneous or questionable data versus limited good data lead to the decision that these methods would not be used.

724.300 Geologic Information Detailed geologic information of the permit and adjacent areas is included in Section 600, with specific strata analyses, as required, in Section 624.

724.310 Probable Hydrologic Consequences. The geologic data indicate that no toxic- or acid-forming materials are known to exist in the coal or rock strata immediately below or above the seam (see Section 624.300). The probable hydrologic consequences of the proposed operation will be discussed in Section 728 and Appendix 7-3 of this application.

724.320 Feasibility of Reclamation. The geologic data in Section 600 provides sufficient detail to allow: the evaluation of whether toxic- or acid-forming materials are expected to be encountered in mining; subsidence impacts; whether surface disturbed areas are designed to be constructed in a manner that will allow for reclamation to approximate original contour; and whether the operation plans have been design to ensure that material damage to the hydrologic balance does not occur outside of the permit area. These issues are evaluated in the R645 rules and discussed in Section 728 of this application.

724.400 Climatological Information

724.410 Climatological Factors

724.411 Precipitation The closest weather recording station to the Lila Canyon Mine is located at Sunnyside, Utah. Based on the relatively close proximity and similar locations (west exposure of the Book Cliffs) the data from this station is representative of the type, intensity and duration of the precipitation at the site area and will be used to verify precipitation amounts and other weather conditions for the Lila Canyon Mine.

Precipitation data from the Sunnyside station has been gathered from 1971 to 2005, showing an average annual precipitation of 14.74 inches. The information was downloaded from the Western Regional Climate Center, as shown on Table 7-1B. The distribution of precipitation shows that September and October average the highest totals. Based on a 1-day precipitation event or less, the probability of precipitation is generally less than 20 percent for an event with 0.01" and less than 5 percent for an event with greater than 0.50" (see Table 7-1C). This indicates that the precipitation events are generally light and consist of infrequent small storms.

A rain gauge will be installed at the site, once construction and operations start, to comply with the reporting requirements of the air quality permit.

724.412 Winds. The average direction of the prevailing winds is West to East, and the average velocity is 2.74 knots.

Table 7-1B

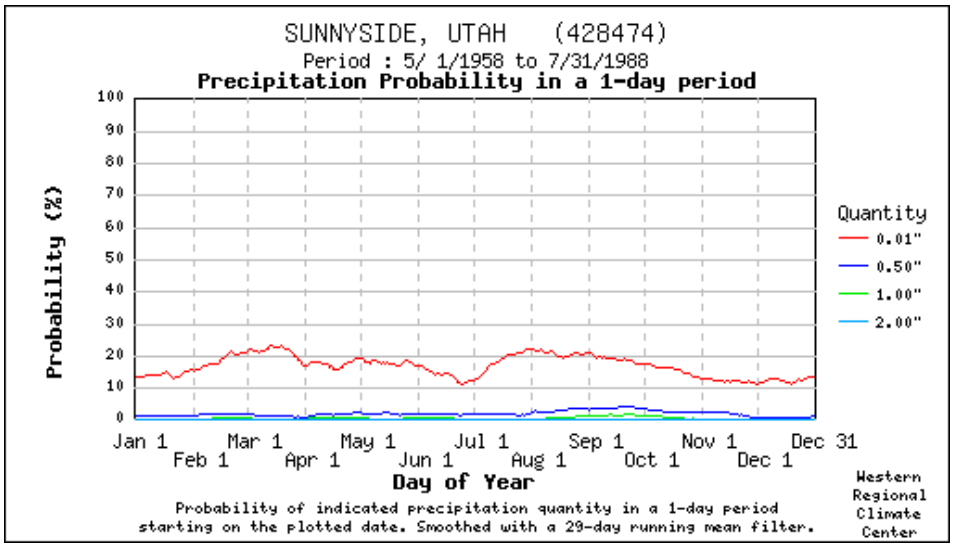
Sunnyside, Utah (428474)
Period of Record Monthly Climate Summary

Period of Record: 1971 - 2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Average Max. Temp(F)	33.7	38.4	44.1	54.0	63.5	76.2	82.4	80.3	71.3	58.3	42.8	34.9	56.8
Average Min. Temp(F)	13.9	17.5	21.8	30.0	38.3	47.2	53.6	52.2	44.7	34.6	22.8	15.3	32.8
Average Total Precip (in.)	0.80	1.01	1.30	1.22	1.22	0.85	1.46	1.50	1.80	1.67	1.14	0.78	14.74

Unofficial values based on averages/sums of smoothed daily data, Information is computed from available daily data during the 1971-2000 period. Smoothing, missing data and observation-time changes may cause these 1971-2000 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check NCDC normals table for official data.

TABLE 7-1C



724.413 Temperature. Mean temperatures in the proposed mine area range from a high of 58.0 degrees F to a low of 33.4 degrees F. See Table 7-1B.

724.420 Additional Data. Additional data will be supplied if requested by the Division to ensure compliance with the requirements of R645-301 and R645-302.

724.500 Supplemental Information N/A - The determination of the PHC in Section 728 does not indicate that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies.

724.700 Valley/Stream N/A - The proposed plan does not include mining or reclamation operations within a valley holding a stream or in a location where the permit area or adjacent area includes a stream which meets the requirements of R645-302-320.

725. Baseline Cumulative Impact Area Information

725.100 Hydrologic and Geologic Information Hydrologic and geologic information for the mine area is provided in Sections 600, 724 and in the PHC Determination in Appendix 7-3. This information includes the available information gathered by the applicant. Additional information is available for the areas adjacent to the proposed mining and adjacent areas from state and federal agencies.

725.200 Other Data Sources As indicated above, additional information is available for the cumulative impact area. In addition to the base line data for the proposed mining, additional pertinent hydrologic data is available from adjacent mines and permits and government reports.

725.300 Available Data Necessary hydrologic and geologic information is assumed to be available to the Division in this P.A.P.

726. Modeling Where ever possible actual surface and ground water information is supplied in this application. However, the following models were used to supplement the data.

Storm 6.2, a program to calculate runoff flows was used to calculate runoff from some disturbed area drainage areas.

Hydroflow Hydrograph program by Intelisolve was used to simulate the runoff and routing from the undisturbed drainages above the proposed mine. As discussed in Section 724.200 of the MRP, the flow simulations provide an understanding of the types and kinds of flow responses that can be expected from the watersheds of the proposed mine area.

A simulation of transmission losses to determine potential impacts from mine water discharge to the Price River and fishery was completed using a spreadsheet based on the NRCS channel loss evaluation.

727. Alternate Water Source Information A search was conducted of the State of Utah Water Rights files for all rights occurring within, and adjacent to, the permit area for a distance of one mile. The location of those rights are shown on Plate 7-3, based on the location provided for the water right. A description of each of the rights, including the name of the water right owner, point of diversion, source of the water, along with the allotted flow and the designated use of the water is tabulated in Table 7-2. Due to the limited volume of water available, the condition of most of the spring and stock pond facilities is very poor. Based on the water rights, for the area of the mine, the use is limited to stockwatering of less than 250 animal units.

Table 7-2

LILA CANYON MINE AREA
Water Rights

Water Right/Owner	cfs	gpm	ac.ft.	Source	Use	Point of Diversion
91-557 Eardley, Joseph K.	0	-	0	So. Fork Horse Canyon Creek	Stockwatering	SW 34, T. 15 S, R. 14 E.
91-557 Eardley Joseph K.	0	-	0	So. Fork Horse Canyon Creek	Stockwatering	NE 34, T. 15 S, R. 14 E.
91-1903 State of Utah	0.08	36	0	Spring	Stockwatering	SE 35, T. 15 S, R. 14 E.
*91-148 IPA	0.30	135	0	U. G. Tunnel	Other	NW 3, T. 16 S., R. 14 E.
*91-149 IPA	0.10	45	0	U. G. Tunnel	Other	NW 3, T. 16 S., R. 14 E.
*91-150 IPA	0.10	45	0	U. G. Tunnel	Other	NW 3, T. 16 S., R. 14 E.
*91-4959 CEUF	0.00	-	5.00	Redden Spring	Mining	NE 3, T. 16 S., R. 14 E.
91-2616 BLM	0	-	0	Stream	Stockwatering	NW 3, T. 16 S., R. 14 E.
*91-183 CEUF	0.8	359	0	Horse Canyon Creek	Domestic, Other	SE 1/4 3, T.. 16 S., R. 14 E.
91-185 Minerals Devel. Co.	0.0190	9	0	Well	Domestic, Other	NW 9, T. 16 S., R. 14 E.
91-618 Mont Blackburn	0.0110	5	0	Mont Spring	Stockwatering	NE 11, T. 16 S., R. 14 E.
91-2615 BLM	0	-	0	Stream	Stockwatering	NW 10, T. 16 S., R. 14 E.
91-617 Mont Blackburn	0.0110	5	0	Leslie Spring	Stockwatering	NW 11, T. 16 S., R. 14 E.
91-4650 BLM	0	-	0	Tributary to Flat Wash	Stockwatering, Other	SW 9, T. 16 S., R. 14 E.
*91-399 IPA	0.050	22	0	Unnamed Spring	Mining, Other	SE 12, T. 16 S., R. 14 E.
91-2537 BLM	0.0120	5	0	Spring	Stockwatering	SE 12, T. 16 S., R. 14 E.

Table 7-2

LILA CANYON MINE AREA
Water Rights

Water Right/Owner	cfs	gpm	ac.ft.	Source	Use	Point of Diversion
91-2521 BLM	0.0110	5	0	Cottonwood Spring	Stockwatering	NE 13, T. 16 S., R. 14 E.
91-4648 BLM	0.00	-	0	Unnamed Wash	Stockwatering, Other	SW 14, T. 16 S., R. 14 E.
91-4649 BLM	0	-	0	Unnamed Wash	Stockwatering, Other	NE 23, T. 16 S., R. 14 E.
*91-810 IPA	0.050	22	0	Unnamed Spring	Mining, Other	SE 24, T. 16 S., R. 14 E.
91-2517 BLM	0.0110	5	0	Pine Spring	Stockwatering	SE 24, T. 16 S., R. 14 E.
91-2618 BLM	0	-	0	Stream	Stockwatering	NW 27, T. 16 S., R. 14 E.
91-2619 BLM	0	-	0	Stream	Stockwatering	SE 28, T. 16 S., R. 14 E.
91-2620 BLM	0	-	0	Stream	Stockwatering	SE 28, T. 16 S., R. 14 E.
91-2621 BLM	0	-	0	Stream	Stockwatering	SW 28, T. 16 S., R. 14 E.
91-2617 BLM	0	-	0	Stream	Stockwatering	SE 27, T. 16 S., R. 14 E.
91-4646 BLM	0	-	0	Wash	Stockwatering, Other	SW 33, T. 16 S., R. 14 E.
91-2518 BLM	0.110	5	0	Williams Spring	Stockwatering	SE 8, T. 17 S., R. 15 E.
91-4516 BLM	0	-	0	Little Park Wash	Stockwatering, Other	SW 7, T. 17 S., R. 15 E.
91-4705 BLM	0	-	0	Bear Canyon	Stockwatering, Other	NW 7, T. 16 S., R. 15 E.
91-4621 BLM	0.0150	7	0	Kenna Spring	Stockwatering, Other	NE 8, T. 16 S., R. 15 E.
91-4701 BLM	0	--	0	Nelson Canyon	Stockwatering, Other	NW 17, T. 16 S., R. 15 E.
91-2519 BLM	0.0110	5	0	Unnamed Spring	Stockwatering, Other	SE 18, T. 16 S., R. 15 E.

Table 7-2

LILA CANYON MINE AREA
Water Rights

Water Right/Owner	cfs	gpm	ac.ft.	Source	Use	Point of Diversion
*91-808 IPA	0.050	22	0	Unnamed Spring	Mining, Other	SW 18, T. 16 S., R. 15 E.
91-2538 State of Utah	0.0120	5	0	Unnamed Spring	Stockwatering	SW 18, T. 16 S., R. 15 E.
91-4701 BLM	0	-	0	Nelson Canyon	Stockwatering, Other	SE 17, T. 16 S., R. 15 E.
91-2539 BLM	0.0120	5	0	Pine Spring	Stockwatering	SW 19, T. 16 S., R. 15 E.
91-4703 BLM	0	-	0	Nelson Canyon	Stockwatering, Other	NW 21, T. 16 S., R. 15 E.
91-4703 BLM	0	-	0	Trib. to Nelson	Stockwatering, Other	NE 29, T. 16 S., R. 15 E.
91-4381 State of Utah	0.0150	7	0	Spring	Stockwatering,	NW 32, T. 16 S., R. 15 E.
91-2520 BLM	0.0110	5	0	Unnamed Spring	Stockwatering	NW 32, T. 16 S., R. 15 E.
*91-809 IPA	0.0500	22	0	Unnamed Spring	Mining, Other	SE 31, T. 16 S., R. 15 E.
91-2535 BLM	0.0120	5	0	Unnamed Spring	Stockwatering	SE 31, T. 16 S., R. 15 E.
91-2646 (Cove #1)	0	0	0	Wash	Stock Watering	NE 06, T.16S., R. 14E.
91-2665 ((Big Pond)	0	0	0	Wash	Stock Watering	NE4 05, T.17S., R. 14E.

Any State-Appropriated water supply that may be damaged by mining operations will either be repaired or replaced. As soon as practical, after proof of damage by mining in Lila Canyon, of any State-Appropriated water supply, ECCR will replace the water. Water replacement may include sealing surface fractures, piping, trucking water, transferring water rights, or construction of wells. The preferable method of replacement will be sealing of surface fractures effecting the water supply. As a last resort ECCR will replace the water by transferring water rights or construction of wells.

As noted in the table, the majority of rights are owned by ECCR for industrial use. Other rights owned by the B.L.M. or individuals are primarily for stockwatering.

ECCR owns the rights to approximately 1.50 cfs in this area. Although the PHC (Appendix 7-3) indicates little, if any, adverse effects on water resources resulting from the operation, if such effects should become evident, lost water sources would be replaced from the rights owned by the company.

728. Probable Hydrologic Consequences (PHC) Determination

728.100 PHC The Probable Hydrologic Consequences (PHC) Determination is provided as a separate document in Appendix 7-3. This determination indicates minimal (or no) negative impacts of the mining or reclamation operation on the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.

728.200 Basis for Determination The PHC is based on baseline hydrologic, geologic and other information such as public records and adjacent mine plan data statistically representative of the site (see Appendix 7-3).

With underground mining, there always exists a potential for impacting surface or ground water resources; however, as indicated in Section 525, subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mining and the surface. Effects on underground water are also expected to be minimal, since this water is not presently issuing to the surface, and any necessary discharges of the water would be in accordance with U.P.D.E.S. requirements.

Water in this area is primarily used for stock or wildlife watering. Any impacts to the small surface springs or seeps as a result of mining would likely be offset by the emergence of new seeps or springs due to fracturing, mine water discharge or replacement of water rights as described under Sections 525, and 731.800.

728.300 Findings

728.310 Adverse Impacts. Potential adverse impacts of the operation on the hydrologic balance include:

(1) Increased sediment loading;

(2) Diminution or interruption of water supplies on water rights;

(3) Discharge (pumping) of contaminated ground water;

(4) Erosion and streamflow alteration;

(5) Deterioration of water quality.

Each of the above potential impacts has been evaluated in the PHC (Appendix 7-3). Based on information provided in this plan to mitigate or otherwise control these impacts, the Probable Hydrologic Consequences determination is that of minimal (or no) negative impacts. (see Appendix 7-3)

728.320 Acid/Toxic Forming Materials (see Appendix 7-3)

728.330 Impacts On:

728.331 Sediment Yield (see Appendix 7-3)

728.332 Water Quality Parameters (see Appendix 7-3)

728.333 Flooding and Streamflow Alteration In the event that sufficient volumes of water are encountered underground that necessitate pumping, the applicant will take the following steps:

(1) Water will be held in sumps as long as possible to promote settling;

(2) Water will be sampled prior to discharge to ensure compliance with UPDES standards;

(3) Prior to mining receiving channel morphology parameters and erosion impacts will be evaluated prior to discharging to any drainage and at least quarterly during pumping to determine what, if any, streamflow alteration is occurring;

(4) If adverse impacts to the receiving stream are noted, steps will be taken, with Division input and approval, to minimize or eliminate those impacts.

(Also see Appendix 7-3)

728.334 Water Availability (see Appendix 7-3)

728.335 Other Characteristics (see Appendix 7-3)

728.340 Surface Mining Activity N/A - Underground Mine

728.400 Permit Revision To be reviewed by the Division.

729. Cumulative Hydrologic Impact Assessment (CHIA)

729.100 CHIA Assessment provided by Division.

729.200 Permit Revision To be reviewed by the Division.

730. Operation Plan

731. General Requirements This will be an underground mine with approximately 40.26 acres of surface disturbance for mine site facilities and roads. Runoff from the disturbed minesite area is proposed to be controlled by a system of ditches and culverts which will convey all

disturbed area runoff to sediment ponds for final treatment prior to discharge.

This permit application includes a plan, with maps and descriptions, indicating how the relevant requirements of R645-301-730, R645-301-740, R645-301-750 and R645-301-760 will be met. Each of these sections are addressed in this Chapter, along with relevant Maps and Appendices.

731.100 Hydrologic-Balance Protection

731.110 Ground-Water Protection In order to protect the hydrologic balance, coal mining and reclamation operations will be conducted according to the plan approved under R645-301-731 and the following:

731.111 Ground-Water Quality Ground-water quality will be protected by the plan described in Section 731 and the following:

(1) Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems. Appendix 6-2 of the MRP presents acid and toxic results from a series of roof and floor samples from the areas north and south of the proposed mine. The samples of the S-24 and S-25 drillholes show the quality of the roof and floor strata located to the south of the proposed operation, while the Lila Fan Portal roof and floor samples show the quality of the strata north of the proposed mine. These samples identified only minor issues with one or two samples for revegetation issues. The recommendations were that these samples would not be a problem when mixed with the surrounding rock. No acid conditions were identified in any of the rock samples. As these samples bracket the mine property and the quality is similar to quality found at other mines along the Book Cliffs and none of these mines have an acid or toxic issue, then it is likely that the rock in the proposed mine area will have the same characteristics.;

(2) Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;

(3) Controlling and treating disturbed area runoff to prevent discharge of pollutants into ground-water, by the use of diversions, culverts, silt fences, sediment ponds and by chemical treatment if necessary;

(4) Minimizing and/or treating mine water discharge to comply with U.P.D.E.S. discharge standards;

(5) Establishing where ground-water resources exist within or adjacent to the permit area through a Baseline Study (done) and monitoring quality and quantity of significant sources through implementation of a Water Monitoring Plan (proposed);

(6) Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC).

731.120 Surface-Water Protection In order to protect the hydrologic balance, coal mining and reclamation operations will be conducted according to the plan approved under 731 and the following:

731.121 Surface-Water Quality Surface-water quality will be protected by handling earth materials, ground-water discharges and runoff in a manner that minimizes the formation of acid or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, otherwise prevent water pollution.

Surface-water quality protection is proposed to be accomplished by the plan described in Section 731 and the following methods:

(1) Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems.

Appendix 6-2 of the MRP presents acid and toxic results from a series of roof and floor samples from the areas north and south of the proposed mine. The samples of the S-24 and S-25 drillholes show the quality of the roof and floor strata located to the south of the proposed operation, while the Lila Fan Portal roof and floor samples show the quality of the strata north of the proposed mine. These samples identified only minor issues with one or two samples for revegetation issues. The recommendations were that these samples would not be a problem when mixed with the surrounding rock. No acid conditions were identified in any of the rock samples. As these samples bracket the mine property and the quality is similar to quality found at other mines along the Book Cliffs and none of these mines have an acid or toxic issue, then it is likely that the rock in the proposed mine area will have the same characteristics. Also, the rock from the access tunnels will be similar to the rock samples for the floor;

(2) Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;

(3) Controlling and treating disturbed area runoff to prevent discharge of pollutants into surface-water, by the use of diversions, culverts, silt fences, sediment ponds, and by chemical treatment if necessary;

(4) Minimizing and/or treating mine water discharge to comply with U.P.D.E.S. discharge standards;

(5) Establishing where surface-water resources exist within or adjacent to the permit area through a Baseline Study (done) and monitoring quality and quantity of significant sources through implementation of a Water Monitoring Plan (proposed);

(6) Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC).

731.122 Surface-Water Quantity Surface water quantity and flow rates will be protected as described in Section 731.

731.200 Water Monitoring The water monitoring program has been implemented since July, 2000. Baseline data has been collected from both surface and groundwater monitoring sites. These sites established the current baseline data set that has been approved by the Division as representing the current surface and groundwater conditions.

Preceding each five year permit renewal, ground (springs) and surface waters will be sampled for baseline parameters, same as listed in Tables 7-4 and 7-5. Sampling of ground and surface waters will be conducted according to the operational monitoring plan, even if the monitoring has been temporarily suspended. It has been determined that minimal monitoring is required based on the anticipated impacts and no appropriated surface water use downstream.

731.210 Ground-Water Monitoring The ground-water monitoring plan is based on results of the Baseline Study and PHC determination. Based on results of these studies, the only ground water expected to be affected in the permit area is that which has been identified as springs or seeps and that which may be expected from perched aquifers encountered by the planned mining. Since no portals are presently discharging on or adjacent to the permit area and since current mining has not encountered water, no underground water is presently available for sampling. Therefore, selected springs are sampled under the Ground Water Monitoring Plan.

If ground water is encountered in future mining, of a quantity which requires discharge, the water will be monitored in accordance with requirements of this section and a monitoring plan will be proposed at that time.

For purposes of the water monitoring program, springs and seeps are considered ground water and will be monitored as such.

731.211 Ground-Water Monitoring Plan Based on information in the PHC determination (Appendix 7-3), and as indicated above, the only ground water resources on or adjacent to the permit area that can be monitored at this time are springs and seeps. See Appendix 7-6 for a detailed description of the water monitoring locations.

There are a total of 13 ground water monitoring sites proposed for this property (see Table 7-3). Station L-5-G is the potential mine discharge point, and will be monitored at least monthly, or as discharge occurs, in accordance with U.P.D.E.S. Permit requirements (see Table 7-4).

Stations L-7-G, L-8-G, L-9-G, L-11-G, L-12-A, L-12-G, L-18-G, and L-19-G are significant springs or seeps located over the area of proposed mining. These springs will be monitored on a quarterly basis for parameters listed in Table 7-5.

Station L-6-G is in the vicinity of two listed water right springs, Mont Spring and Leslie Spring. These springs are within the same small drainage and may in fact be the same spring. Close examination of spring/seep and baseline monitoring stations show only one site in this drainage with any consistent flows - site H-18; therefore, this site was originally chosen to monitor the Mont and Leslie Springs area. However, in recent years L-6-G has been dry and a new wet area upstream of L-6-G, Location L-11-G, has been added to replace site L-6-G. Sampling at L-6-G was suspended as of the First Quarter of 2003.

Monitoring site L-7-G is intended to monitor a listed site known as Cottonwood Spring. Once again, a close examination of water rights information along with spring/seep and baseline monitoring has shown only one site in this area with any consistency - site #9; therefore, this is the site chosen for monitoring of Cottonwood Spring.

L-8-G is an unnamed spring that matches EarthFax sample site 10.

L-9-G is known as Pine Spring. There are two locations that are identified as Pine Spring. These are water rights 91-2517 and 91-2539, which are part of the same water right filing. In the spring and seep inventories there has never been any flow identified in the area of 91-2517 as the site is located off of the stream channel. It is assumed that the filing for 91-2517 is a duplicate but the location is wrong. There have been numerous seep/spring notations in the local area, but the only consistent flowing site is 91-2539; this is the site that will be monitored for Pine Spring. (In a recent archeological study, the location of the site that has

been monitored as L-9-G was determined using GPS coordinates. The location for this site was determined to be different than what was plotted on the Plates 7-1, 7-1A, and 7-3. Based on this new data, the location of the spring has been updated.)

L-10-G is also an unnamed spring that matches EarthFax sample site 14. Since this site is located over 1 mile south of the permit area, it has been replaced with L-12-G which is a more appropriate site to monitor. Monitoring of site L-10-G was suspended as of the First Quarter of 2003.

L-11-G is located in the bottom of the upper reaches of Lila Canyon. This is in the same drainage as the Mont and Leslie Springs water right locations. In recent years L-6-G (H-18) has been dry. However, there has been some minimum flow observed approximately one hundred yards above L-6-G where L-11-G was established.

L-12-A is an unnamed seep in the headwaters of the Left Fork of Williams Draw that was added in 2Q 2022 to help in monitoring the area over lying the proposed longwall expansion.

L-12-G is an unnamed spring which had been developed to replace L-10-G and is now currently being monitored.

L-13-S, L-14-S, L-15-S, and L-18-S are sites that were being monitored to assist in characterization of the various drainages. Monitoring of L-13-S, L-14-S and L-18-S were suspended in 3rd Quarter of 2011. Monitoring of L-15-S was suspended in 1st Quarter of 2003.

L-16-G and L-17-G are seeps being monitored in Stinky Spring Canyon. These sites were not identified during baseline surveys and are believed to exist intermittently and are not always evident. These two seeps appear to be an important source of water for Bighorn sheep specifically in the early spring.

L-18-G is a seep in Noname Wash that was added in 2Q 2022 to monitor the area overlying the proposed longwall expansion.

L-20-G is a seep located north of the permit boundary along a tributary to Little Park Wash. It was identified in the original spring and seep survey and was monitored until 3rd Quarter, 2012.

It should be noted that data has been gathered on the various seeps/springs as part of the original baseline inventory for the South Lease by I.P.A. The data was gathered over the years 1993, 1994 and 1995 and was stopped. In the second quarter of 2001 water monitoring continued. In 2022, water monitoring for the sites L-12-A and L-18-G were added to the water monitoring program for baseline data for the lease expansion. Water samples were collected for the Spring sampling period and results of those samples are presented in Appendix 7-6. Flows at these sites were checked in summer and fall periods, however, the sites were just damp and no water samples could be collected.

The seep/spring inventory data is shown in Appendix 7-1 and locations are shown on Plate 7-1. Proposed water monitoring sites are shown on Plate 7-4.

IPA-1 and IPA-2 are groundwater piezometers in the Little Park Wash area. These holes will be checked quarterly for water depth only. Monitoring of these sites will continue until the mining or subsidence renders them unusable. IPA-3 will be intersected by mining in early 2018 and will be sealed as per BLM regulations prior to mining in the expected area takes place.

At a minimum, total dissolved solids or specific conductance corrected to 25 degrees C, pH, total iron, total manganese and water levels will be monitored, on all points except the IPA wells.

731.212 Monitoring Reports During periods of active monitoring, ground water will be monitored and data will be submitted at least every three months for each monitoring location. Monitoring submittals will include analytical results from each sample taken during the approved reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, then the operator will promptly notify the Division and immediately take the actions provided for in 145 and 731.

731.213 Waiver of Monitoring N/A - No waiver is requested.

731.214 Ground-Water Monitoring Duration Ground-water monitoring will continue through mining and reclamation until bond release.

The Division may approve modifications to the monitoring plan if, based on the monitoring data, it finds:

> **731.214.1** "The coal mining and reclamation operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses"; or,

731.214.2 until "Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under R645-301-731.211."

Therefore, ECCR requests that the ground water monitoring plan be modified as follows:

One spring to the north of the northern edge of the permit boundary named Quaker Spring, will be monitored for two years to develop a baseline data set. It will be designated as L-20-G. Following the baseline data collection its monitoring will follow the operational monitoring schedule for the upper springs (shown on Table 7-3).

As baseline for the ground water conditions has been described by the monitoring to date for the Lila Canyon permit area, ECCR will discontinue monitoring of the monitoring well water levels until mining intercepts the projected regional piezometric surface, as shown on Plate 7-1, and the springs and seeps until just before second mining takes place within the mine permit area. If mining encounters the regional piezometric surface, then water level monitoring will be resumed. Two years before second mining is anticipated to enter into an area that could affect the surface waters, then monitoring of the wells and springs and seeps will resume and the data compared with the baseline. All surface water monitoring will not start at the same time. Monitoring will resume as the second mining enters an area where the mining could affect the surface waters.

ECCR recognizes the Division's concerns for springs, L-G-16 and L-G-17, located at the top of the Mancos Shale, below the escarpment. While concerns of the use of these springs for wildlife have been suggested, UEI does not believe that the wildlife are using these waters. The TDS values have been excessive which are believed to limit or preclude the use of this water by wildlife. At the Division's request, these sampling sites will continue to be monitored, while additional evaluation of wildlife use is made.

The existing baseline data shows the current ground water conditions for the permit area. No significant groundwater impacts have been identified from current first mining

activities. Continuous additional monitoring will only unnecessarily duplicate costs for data that has already been collected.

Also, it is desired that the monitoring during the first quarter not be continued. During the data collection period, there have been few first quarter periods when it was feasible to gain access to the upper elevations of the Book Cliffs and when access was available to the top during these periods, the snow cover in the canyons prevented access to the spring locations and the springs which were accessed were frozen. Therefore, it would be realistic to recognize the existing field conditions and adjust the monitoring plan accordingly.

The monitoring plan would be modified to require monitoring during the spring, summer and fall quarters.

731.215 Monitoring Equipment Equipment, structures and other devices used in conjunction with monitoring the quality of ground water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator when no longer needed.

731.220 Surface Water Monitoring Surface water monitoring will be conducted in accordance with the plan described in this section.

Based on results of the PHC determination, baseline study and other available information, numerous small springs and seeps exist within, and adjacent to, the permit area. In addition, ephemeral drainages in the area flow in response to snow melt and precipitation events. The proposed surface water monitoring program will monitor the significant surface water sources, including drainages above and below the disturbed mine site area, and all point-source discharges (i.e. sediment pond). Seeps, springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in the previous section.

It should be noted that field sheets in Appendix 7-2 refer to a point HC-2, while Bar Graphs and Spreadsheets refer to a station B-1. It has been determined that these are the same point. The site is designated B-1 on Plate 7-1, with a red HC-2 in parenthesis. The

electronic data inventory (EDI) also shows both B-1 and HC-2 designations for this site.

Another HC-2 site is listed in the seep/spring inventories in Appendix 7-6 and in the baseline data in Appendix 7-1. This station is also occasionally referred to as H-2 in the seep/spring inventories (Appendix 7-6). It has been determined that the H-2 and HC-2 sites referred to in these two appendices are the same station. The station location is shown on Plate 7-1, where it is designated H-2 with a green (HC-2) in parentheses.

There is one other station with confusing designations in the data from Appendix 7-2 and 7-6 - station HCSW-1. This station has 3 different designations in the data - HCSW-1, HSW-1, and HC-1. The point is shown as HC-1 on Plates 7-1 and 7-4; however, a note has been added to Plate 7-1 to show the station is also called (HCSW-1), to eliminate confusion. It should also be noted that there is a seep/spring site designated as H-1 on Plate 7-1. This is not to be confused with any of the above listed HC, HSW or HCSW sites.

These are the only known duplication or wrong designation of sample site numbers. It appears that different samplers or companies conducting seep/spring inventories occasionally used different designations for the same sites - the main problem being the use of H-# or HC-# for the same location, in some instances. Every effort has been made to refine the station identifications and locations on Plate 7-1 to reflect the sampling data provided in Appendices 7-1, 7-2 and 7-6. Wherever a site has 2 different designations, both are shown with one in parentheses.

Table 7-3 presents a list of proposed surface water monitoring sites. Based on the two years of surface water sampling at locations CG-2, CG-3, CG-4, CG-5, CG-6, and CG-7 which characterized the drainages as Intermittent by rule with ephemeral flow or ephemeral, which matched the description of these drainages provided in the PAP, these sampling locations will no longer be sampled. Additionally, the surface water sites for these drainages are also requested to be discontinued as explained below in Section 731.224.2.

Locations of all monitoring sites are shown on Plate 7-4 , “Water Monitoring Location Map”.

Proposed monitoring methods, parameters and frequencies are described in Table 7-3, “Water Monitoring Stations”, Table 7-4, “Surface Water Monitoring Parameters”, and Table 7-5 “Ground Water Monitoring Parameters”.

In any active quarter, a minimum of three unsuccessful attempts will be made by using either 4 wheel drive vehicles or ATV’s to access all water monitoring sites prior to reporting any site as “No Access”. However, safety and common sense will prevail while making these attempts.

Monitoring reports will be submitted to the Division at least every 3 months, within 30 days following the end of each quarter.

731.221 Surface-Water Monitoring Plan The proposed surface-water monitoring plan is detailed in Section 731.220. This plan is based on PHC determination and analysis of all baseline hydrologic, geologic and other information in this permit application. The plan provides for monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance as set forth in 751 (see Table 7-4).

731.222 Surface-Water Monitoring Parameters The surface-water monitoring parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4 .

The plan will provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area, by comparison with relevant baseline data and with applicable effluent limitations.

731.222.1 Non-point Source Locations The parameter list in Table 7-4 provides monitoring for all parameters required by this section. The monitoring locations and frequencies described in Table 7-3 show that all significant springs, seeps, impoundments and drainages that could potentially be impacted by the mining and reclamation operations will be monitored on a regular basis.

731.222.2 Point-source Discharges Point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for Utah Pollutant Discharge Elimination System (U.P.D.E.S.) permits. A U.P.D.E.S. discharge permit application has been submitted to the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. Existing U.P.D.E.S. permit applications for the Lila Canyon Mine are provided in Appendix 7-5.

731.223 Reporting As indicated in Section 731.220, surface-water monitoring data will be submitted at least every 3 months during active monitoring for each monitoring location. When analysis of any surface water sample indicates non-compliance with the permit conditions, the company will promptly notify the Division and immediately take actions to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety is in imminent danger due to the non-compliance.

731.224 Duration Surface-water monitoring will continue through mining and reclamation until bond release. Locations, parameters and/or sampling frequency (other than U.P.D.E.S. discharge points) may be modified by the Division if:

731.224.1 "The operator has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses"; or,

731.224.2 "Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under 731.221.

Therefore, ECCR requests that the surface water monitoring plan be modified as follows:

As baseline for the surface water conditions have been described by the monitoring to date for the Lila Canyon permit area, ECCR will discontinue monitoring of the surface water sites away from the surface facilities until just before second mining takes place within the mine permit area. Two years before second mining is anticipated to start, then monitoring will commence again and the data compared with the baseline.

The existing baseline data shows the current surface water conditions for the permit area. No significant surface water impacts have been identified from current first mining activities. Continuous additional monitoring will only unnecessarily duplicate costs for data that has already been collected.

As the two years of ephemeral wash characterization data have been collected and the data reflects the flow conditions as described in the surface water hydrology sections of the PAP, the sites CG-1 through CG-7 will be suspended and discontinued. Also, the upper rain gauge RS-2 will be suspended. These sites were installed and data were collected, as part of a Board Order settlement, to demonstrate that the upper drainages were ephemeral in nature and that the flow characteristics had been correctly described in the PAP.

Additionally, the sampling frequency for sites L-1-S, L-2-S, and L-3-S be changed from monthly to quarterly. As the baseline for these sites have been determined and there is no impact from the mining, reduction of the sampling frequency is justified. These sites will be sampled quarterly and flows will be recorded when they occur.

Also, it is desired that the monitoring during the first quarter not be continued. During the data collection period, there have been few first quarter periods when it was feasible to gain access to the upper elevations of the Book Cliffs and when access was available to the top during these periods, the snow cover in the canyons prevented access to the sampling locations and the sites which were accessed were either dry or frozen. Therefore, it would be realistic to recognize the existing field conditions and adjust the monitoring plan accordingly.

The monitoring plan would be modified to require monitoring during the 2nd, 3rd, and 4th quarters.

See Table 7-3 for the surface water monitoring schedule.

731.225 Monitoring Equipment Equipment, structures and other devices used in conjunction with monitoring the quality and quantity of surface water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator when no longer needed.

731.300 Acid- and Toxic-Forming Materials Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by implementation of a Spill Prevention Control and Countermeasure (SPCC) Plan and by the following:

731.311 Identification/Burial of Acid- or Toxic-Forming Materials
Potentially acid- or toxic-forming materials will be identified by use of Material Safety Data Sheets (MSDS), or by direct sampling and analysis in the case of underground development waste.

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

731.312 Storage of Acid- or Toxic-Forming Materials Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Unused or obsolete equipment or supplies will be stored in a designated area. Drainage from the storage area will be directed to the sediment pond as shown on the Sediment Control Map, Plate 7-5.

Underground development waste (if any) will also be stored in a designated area. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms.

731.320 Storage, Burial, Treatment All storage, burial and treatment practices will be as described in this permit, and consistent with applicable material handling and disposal provisions of the R645-Rules.

731.400 Transfer of Wells There are presently three piezometers on this permit. When these piezometers are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (see Section 631.200). The Horse Canyon Well has been donated to the College of Eastern Utah as part of the Post Mine Land Use Change.

731.500 Discharges The only proposed discharges from this operation will be from the sediment pond and/or underground mine water. Each of these potential discharges would be monitored and controlled within requirements of approved U.P.D.E.S. Discharge Permits.

731.510 Discharges into an Underground Mine There are no plans to discharge any water into an underground mine. This section is not applicable.

731.512 Types of Discharge The only planned discharges from this site are water, in the form of sediment pond discharge or underground mine water discharge.

731.512.1 Water See Section 731.512.

731.512.2 Coal Processing Waste N/A - There are no plans to process coal or discharge coal processing waste from this site.

731.512.3 Fly Ash from a Coal-Fired Facility N/A - There are no plans for a coal-fired facility at this time.

731.512.4 Sludge from Acid-Mine-Drainage Treatment N/A There are no plans for an acid-mine-drainage treatment facility at this time.

Table 7-3
Lila Canyon Mine
Water Monitoring Stations

Station	Location	Type	Frequency	Remarks
L-1-S	Lila Canyon	Int. Stream	**Quarterly**	At mine Site
L-2-S	Rt. Fork Lila (above mine)	Ephemeral Stream	**Quarterly**	RF Above Mine Site
L-3-S	Lila Canyon (below mine)	Int. Stream	**Quarterly**	RF Below Mine Site
L-4-S	Sediment Pond	Discharge	Monthly or as occurs	Per UPDES Permit
L-5-G	Mine Water	Discharge	Monthly or as occurs	Per UPDES Permit
L-6-G	Lila Canyon	Spring	**Sampling Permanently Suspended 1Qtr 2003**	Replaced by L-11-G Water Right 91-617
L-7-G	Little Park	Spring	**Quarterly**	Cottonwood Spring Sample Site 9 Water Right 91-2521
L-8-G	Little Park	Spring	**Quarterly**	Unnamed Spring Sample Site 10 Water Right 91-2538
L-9-G	Little Park	Spring	**Quarterly**	Pine Spring Sample Site 16Z Water Right 91-2539
L-10-G	Williams Draw	Spring	**Sampling Permanently Suspended 1Qtr 2003**	Replaced by L-12-G Water Right 91-809
L-11-G	Lila Canyon	Spring	**Quarterly**	Mont/Leslie Spring Replaces L-6-G Water Right 91-618

Table 7-3
Lila Canyon Mine
Water Monitoring Stations

Station	Location	Type	Frequency	Remarks
L-12-A	Left Fork of Williams Draw	Spring/seep	**Quarterly**	Added for longwall expansion
L-12-G	Section 25 Spring	Spring	**Quarterly**	Replaces L-10-G
L-13-S	Little Park Wash	Dry Wash	**Sampling Permanently Suspended 3Qtr 2011**	At Road Crossing
L-14-S	Section 25 Noname Wash	Dry Wash	**Sampling Permanently Suspended 3Qtr 2011**	At Road Crossing
L-15-S	Williams Draw Wash	Dry Wash	**Sampling Permanently Suspended 1Qtr of 2003**	At Road Crossing
L-16-G	Stinky Spring Wash	Seep	**Quarterly**	Top of Mancos
L-17-G	Stinky Spring Wash	Seep	**Quarterly**	Top of Mancos
L-18-G	Noname Wash	Spring/seep	**Quarterly**	Added for longwall expansion
L-18-S	Stinky Springs Wash	Dry Wash	**Sampling Permanently Suspended 3Qtr 2011**	Adjacent to Access Road
L-19-S	Little Park Wash	Dry Wash	**Quarterly**	At Permit Boundary

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L-20-G	Quaker Spring	Seep	**Sampling Permanently Suspended 3Qtr 2012**	North of Permit Boundary
IPA-1	Little Park	Borehole	**Quarterly**	Water Level Only
IPA-2	Little Park	Borehole	**Quarterly**	Water Level Only
IPA-3	Little Park	Borehole	**Sealed in Fall of 2017**	Water Level Only

NOTE: Sites L-13-S, L-14-S, L-15-S, L-18-S, were monitored monthly during the permitting process to determine flow characteristics of the various washes. The monitoring locations are no longer needed since the flow characteristics have been well documented. The monitoring locations are where the road crosses dry washes. Samples have never been taken and flow has never been observed. CG-2, CG-3, CG-4, CG-5, CG-6, and CG-7 were suspended following completion of wash characterization study.

Note: Site L-20-G has been permanently suspended following completion of baseline monitoring for the initial mine permit. The monitoring site is outside the permit area and is also outside the influence of subsidence. No further monitoring is needed.

Other sites temporarily suspended until two year prior to second mining influence.

Due to access concerns only the 2nd, 3rd and 4th quarters will be sampled. First quarter has been no access.

In the event Mining Activity is anticipated to take place in the path of IPA wells 1, 2, and 3, sealing procedures outlined by BLM regulations will be followed to seal the wells prior to mining taking place in the area.

Table 7-4
Lila Canyon Mine
Surface Water Monitoring Parameters
Operational and Post-Mining

Field Measurements	Reported As
Water Level or Flow	Depth, Flow
pH	Standard Units
Specific Conductivity (ohms/cm)	umhos/cm @ 25° C
Temperature	° C
Dissolved Oxygen	mg/l
Laboratory Measurements	**Reported As**
Total Dissolved Solids	mg/l
Total Settleable Solids	(UPDES)
Total Suspended Solids	mg/l
Total Hardness ($CACO_3$)	mg/l
Total Alkalinity	mg/l
Carbonate (CO_3^{-2})	mg/l
Bicarbonate ($(HC)_3^{-1}$)	mg/l
Calcium (Ca) (Dissolved)	mg/l
Chloride (Cl^-)	mg/l
Iron (Fe) (Dissolved)	mg/l
Iron (Fe) (Total)	mg/l
Magnesium (Mg) (Dissolved)	mg/l
Manganese (Mn) (Dissolved)	mg/l
Manganese (Mn) (Total)	mg/l
Potassium (K) (Dissolved)	mg/l
Sodium (Na) (Dissolved)	mg/l
Sulfate (SO_4^{-2})	mg/l
Oil and Grease (As required)	mg/l
Cations	meq/l
Anions	meq/l

Table 7-5
Lila Canyon Mine
Ground Water Monitoring Parameters
Operational and Post-Mining

Field Measurements	Reported As
Water Level or Flow	Depth, Flow
pH	Standard Units
Specific Conductivity	umhos/cm @ 25° C
Temperature	° C
Laboratory Measurements	**Reported As**
Total Dissolved Solids	mg/l
Total Hardness ($CACO_3$)	mg/l
Total Alkalinity	mg/l
Carbonate (CO_3^{-2})	mg/l
Bicarbonate ($(HC)_3^{-1}$)	mg/l
Calcium (Ca) (Dissolved)	mg/l
Chloride (Cl^-)	mg/l
Iron (Fe) (Dissolved)	mg/l
Iron (Fe) (Total)	mg/l
Magnesium (Mg) (Dissolved)	mg/l
Manganese (Mn) (Dissolved)	mg/l
Manganese (Mn) (Total)	mg/l
Potassium (K) (Dissolved)	mg/l
Sodium (Na) (Dissolved)	mg/l
Sulfate (SO_4^{-2})	mg/l
Oil and Grease (As required)	mg/l
Cations	meq/l
Anions	meq/l

731.512.5 Flue-gas Desulfurization Sludge N/A - There are no plans for flue-gas desulfurization at this site.

731.512.6 Inert Materials N/A - There are no plans to use or discharge inert materials used for stabilizing underground mines.

731.512.7 Any underground mine development wastes that cannot be left and permanently stored underground will be brought to the surface and stored in a controlled, designated location. Final disposal of such material will depend on its volume, physical and chemical characteristics and potential for use in reclamation. There are presently no plans to return such material underground; however, if this does become necessary in the future, complete plans will be submitted for disposal at that time.

731.513 Water from Underground Workings Based on historical data from other mines in the area, some mine water can be expected to be encountered during the mining operation. Typically, such water is stored in “sumps” or designated areas in the mine and used for mining operations or discharged to the surface. A sump is an underground storage area that is used to temporarily store water before it is used underground or pumped to the surface for discharge. The main purpose of a sump is to remove sediments. The sump will also remove oil/grease if they were to get into the water. The size of a sump can vary from a few hundred gallons to several thousand gallons. The size normally depends on the space available and the amount of water needed for mining operations.

In order to more accurately define the potential impact of the mine on ground water, underground usage discharge amounts, if they were to occur, would be documented. This information along with the surface monitoring program will provide the best information available as to the potential impact of the mine on ground water.

IPA piezometers 1-2 will still be monitored quarterly if possible. The three piezometers were monitored on December 22, 2000. The water level probe during this period was unable to reach the depth required to measure the water level of IPA-1 and IPA -3. Another attempt will be

made to enter these piezometers when the sites are accessible.

The water level of IPA-2 was very consistent with the last reading taken on April 29, 1996. This piezometer (IPA-2) is the farthest west of the three piezometers and is up dip from the other two. Any impact to ground water would be noticed very quickly at IPA-2. This information from IPA-2 along with the past baseline data on the three piezometers and the in mine water monitoring program mentioned above, would provide an accurate evaluation of potential ground water impacts.

At the present time, there are no plans to divert water from the underground workings of this operation to any other underground workings.

If it became necessary to discharge water from the mine, this water would be discharged in accordance with the UPDES permit application in Appendix 7-5. The water would be discharged into the Right Fork of Lila Canyon. Refer to Plate 7-5.

731.520 Gravity Discharges Location of the proposed portal slopes are below the western (upper) exposure of the easterly dipping coal bed. In the area immediately around the proposed portals, no water is presently issuing from the strata above or below the coal outcrop; therefore, it is assumed any water encountered in the underground mining will not be under artesian pressure or with sufficient hydrostatic head to raise it to the portal site.

The coal seam to be mined dips away from the portal site at approximately 10%. If water is encountered in the mining, it will likely be at a static level far below the exposed outcrop or rock slopes. This may result in some possible mine discharge from pumping, but not from gravity.

731.521 Portal Location The proposed access portals are below the coal outcrop, as shown on Figure 7-1, Plates 5-5 and 7-5. The ventilation breakout locations are shown on Plate 5-2 and 5-2a. The rock slopes will slope up to the east at approximately 12% to contact the coal seam; however, the coal seam is dipping down to the east in this area. The approximate point

of contact between the rock slopes and the coal seam will be 1227' from the surface at an elevation of 6300'. Ground water levels in the mining area, based on the 3 water monitoring holes and other geologic data, appear to be nearly static at elevation 5990 in this area (see Figure 7-1).

Water level in the mine would have to raise approximately 310' to reach the rock slope/coal seam contact and result in a gravity discharge. Water monitoring results and other historical data in the area do not indicate this is likely to occur.

731.522 Surface Entries after January 21, 1981 This is not known to be an acid-producing or iron-producing coal seam; however, proposed portals are located to prevent gravity discharge from the mine (see Section 731.521).

731.600 Buffer Zones All streams within the permit area are either ephemeral or intermittent by rule with ephemeral flow. In the area of the surface facilities along the intermittent by definition Lila Wash, the Operator will install stream buffer zone signs in locations shown on Plate 5-2 and maintain the buffer zones during the operation.

731.700 Cross Sections and Maps The following is a list of cross-sections and maps provided in this section of the P.A.P.

Plate 7-1	Permit Area Hydrology Map
Plate 7-2	Disturbed Area Hydrology/Watershed
Plate 7-3	Water Rights Locations
Plate 7-4	Water Monitoring Location Map
Plate 7-5	Proposed Sediment Control Map
Plate 7-6a	Proposed Sediment Pond #1
Plate 7-6b	Proposed Sediment Pond #2
Plate 7-7	Post-Mining Hydrology

All required maps and cross-sections have been prepared by, or under the supervision of, and certified by a Registered Professional Engineer, State of Utah.

731.710 General Area Hydrology Plate 7-1.

731.720 Plate 7-2.

731.730 Water Monitoring Map Plate 7-4.

731.740 Sediment Pond Map Plates 7-6a and 7-6b.

731.750 Plate 7-6a & b.

731.760 Other Maps (See Section 731.700 for a complete list of maps provided in this section).

731.800 Water Rights and Replacement (See Section 727)

732. Sediment Control Measures

732.100 Siltation Structures The only proposed siltation structures for this site are the sediment ponds. All disturbed area runoff is proposed to be directed to these ponds for final treatment prior to discharge.

The sediment ponds will be constructed and maintained in compliance with applicable regulations. Details of the proposed ponds are discussed in the following section and in Appendix 7-4.

732.200 Sedimentation Ponds As discussed above, all disturbed area runoff is proposed to be directed to a sediment pond for final treatment prior to any discharge. The proposed sediment ponds will be located at the low points of the disturbed area, as shown on Plate 7-5.

732.210 Sediment Pond Details The proposed sediment ponds are considered temporary, and will be removed during final reclamation. The ponds are designed in compliance with the requirements of the following sections, as required:

356.300 - The ponds will be maintained until the disturbed area has been stabilized and revegetated. Removal shall not be any sooner than 2 years after the last augmented seeding;

356.400 - Upon removal, the ponds' areas will be reclaimed and reseeded according to the reclamation plan;

513.200 - N/A - The proposed sediment ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a);

763 - Refer to this regulation addressed later in this chapter.

Design details for the sediment ponds and site drainage controls are addressed in Appendix 7-4 of this P.A.P.

732.220 MSHA Requirements This section does not apply since there are no plans for construction of coal processing waste dams or embankments at this site. The proposed ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a).

732.300 Diversions There is one undisturbed diversion planned for this site. This diversion consists of a bypass culvert beneath the sediment pond, which will allow undisturbed runoff to bypass the site without mixing with disturbed area runoff.

Other diversions planned consist of disturbed area ditches and culverts, as shown on Plate 7-5. Design details for all diversions are provided in Appendix 7-4.

All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300. Details are described under those respective sections of this chapter.

732.400 Road Drainage All roads will be constructed, maintained and reconstructed to comply with R645-301-742.400. Specific information to road drainage is provided under that section of this chapter.

732.410 Alteration or Relocation of Natural Drainages There are no plans to construct roads which will require alteration or relocation of natural drainageways, other than by providing

culverted crossings over ephemeral drainages. There are no plans to alter or relocate any intermittent or perennial drainages in conjunction with road construction.

Road construction and design details are provided in Chapter 5 of this P.A.P. Road drainage and culvert design details are provided in Appendix 7-4.

732.420 Culverts Culvert details are provided in Appendix 7-4. All undisturbed culvert inlets will be provided with headwall protection, consisting of inlet sections, rock or concrete.

733. Impoundments The only water impoundments proposed for this site are the sediment ponds. Design details for the pond are provided in Appendix 7-4 and on Plates 7-6a &b.

733.100 General Plans The general plan for this site is to drain runoff from the disturbed area into two sedimentation ponds for treatment prior to discharge. Site drainage and design details are described in Appendix 7-4. The general plan includes the following, at a minimum:

733.110 Certification The sediment control plan and proposed sediment pond designs have been prepared and certified by a Registered Professional Engineer, State of Utah.

733.120 Maps and Cross Sections Sediment pond locations, design plans and cross sections are provided on Plates 7-5 and 7-6a & b, respectively.

733.130 Narrative A complete description of the proposed sediment pond along with volumes and design/construction details in provided in Appendix 7-4.

733.140 Survey The proposed sediment ponds are not located within a potential subsidence area from past underground mining operations.

733.150 Hydrologic and Geologic Information Relevant hydrologic and geologic information for the sediment ponds are provided in Appendix 7-4.

733.160 Certification Statement All proposed sediment pond structures are provided with this submittal. The structure will be constructed prior to construction of the mine site area, but not before receiving Division approval.

733.200 Permanent and Temporary Impoundments As indicated earlier, the proposed sediment ponds are classed as temporary.

733.210 Design Requirements The proposed sediment ponds are temporary; therefore, the ponds are not designed to meet requirements of MSHA 30 CFR 77.216.

The proposed ponds are not located where failure would expect to cause loss of life or serious property damage. As shown in Appendix 7-4, the proposed pond embankments will have a minimum of 3H : 1V on the inside slope and 2H : 1V on the outside. These slopes, along with the 95% compaction requirement, will ensure a static safety factor in excess of 1.3, as required.

733.220 Permanent Impoundment Section 733.220 is not applicable since the impoundment will be temporary.

733.230 Temporary Impoundment The proposed sediment ponds are temporary impoundments, and will be removed when reclamation sediment control and revegetation criteria are met, in accordance with Phase II Bond Release criteria.

733.240 Inspections/Potential Hazards As indicated under Section 515.200, if any examination or inspection shows a potential hazard exists, the person who examined the impoundment will promptly notify the Division of the finding and emergency procedures formatted for public protection and remedial action.

734. Discharge Structure All discharges from sedimentation ponds, diversions and culverts will be protected from erosion by the use of adequately sized rip-rap, concrete or other approved protection. Details for outlet protection for all drainage control structures are provided in appendix 7-4. All discharge structures have been designed according to standard engineering design procedures.

735. Disposal of Excess Spoil No excess spoil production is anticipated.

736. Coal Mine Waste Any areas designated for the disposal of coal mine waste will be constructed and maintained to comply with R645-301-746. Details are described under that section.

737. Noncoal Mine Waste Storage and final disposal of noncoal mine waste are described under section 747.

738. Temporary Casing and Sealing of Wells There are no wells proposed to be used to monitor ground water conditions associated with this permit or operation. The three Piezometers will be reclaimed according to the requirements of the Division's Performance Standards.

740. Design Criteria and Plans Design criteria and plans for this permit are detailed in Appendix 7-4. The following section will describe the general drainage and sediment control plan.

741. General Requirements The proposed operation is an underground mine with a relatively small surface disturbance for transportation, support and coal handling facilities. The proposed surface facilities will comprise a disturbed perimeter of approximately 40.26 acres. Access roads and utility lines will consist of approximately 10 acres of additional disturbance along a BLM Right-of-Way designated as a "Transportation Corridor".

The majority of undisturbed runoff from areas above the proposed mine site will be diverted beneath the site via an undisturbed diversion culvert. Runoff from the disturbed mine site area will be directed to sediment ponds, designed to contain and treat the runoff from a 10 year - 24 hour precipitation event for the contributing watershed. Disturbed area runoff will be directed to the sediment ponds via a combination of properly sized ditches and culverts. The general drainage control plan for the mine site is shown on Plate 7-5. The complete Drainage Design and Control Plan is provided in Appendix 7-4 of this P.A.P.

742. Sediment Control Measures See Appendix 7-4 for Sediment Control Measure details.

742.100 General Requirements

742.110 Designed/Constructed/Maintained Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:

742.111 "Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;"

This will be accomplished by the construction of undisturbed diversions to allow most undisturbed runoff to by-pass the site and by routing all disturbed runoff to sediment ponds for treatment prior to discharge.

742.112 "Meet the effluent limitations under R645-301-751;"

Any discharge from the sediment ponds will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

742.113 "Minimize erosion to the extent possible:" This will be accomplished by proper routing of drainage, and by the use of energy dissipators and/or erosion protection at all sediment pond, ditch and culvert outlets and in ditches where erosive velocities are expected.

742.120 Sediment Control Measure Sediment control measures within and adjacent to the disturbed areas are detailed in Appendix 7-4. These measures include, but are not limited to:

742.121 As discussed in Appendix 7-4, runoff from the disturbed area will be captured in sediment ponds and/or treated as necessary to meet effluent limitations prior to discharge.

742.122 As discussed in Appendix 7-4, the majority of undisturbed drainage from above the mine site will be diverted via designed undisturbed diversions.

742.123 Undisturbed diversions will consist of properly designed and protected channels and/or culverts as described in Appendix 7-4.

742.124 The primary means of velocity reduction is planned to be the use of rip-rap; however, other methods such as straw dikes, check dams and/or vegetative filters may be employed during the operational or reclamation phases as determined necessary, and with Diversion approval.

742.125 There are no plans to treat runoff with chemicals. Based on extensive experience with runoff in this area, effluent requirements for discharge can normally be met by containment and settling in a sediment pond.

742.126 It is expected that water will be encountered in the underground mining; however, this water will be used for mining needs and only discharged when no further storage is available underground. Any discharge of mine water will meet applicable effluent limitations. Such water will be sampled (and treated if necessary) prior to discharge.

742.200 Siltation Structures As described in Appendix 7-4, the sediment ponds will provide for sediment removal for most of the surface facility disturbance. An alternate sediment control methods of berms and silt fences will be used at the ventilation breakouts, around the topsoil stockpile area, and on the slopes below the water treatment area and portal access road. The description of this alternate sediment control method is also described in Appendix 7-4. In the case of the ventilation breakouts, this is necessary due to its remote location and rough terrain. In the case of the water treatment slope, due to topography, there is no way to direct the runoff to the sediment basins. Other sediment structures that might be used around the surface facilities are temporary sediment traps such as straw dikes and/or catch basins.

742.210 General Requirements Siltation structures will be designed, constructed and maintained in accordance with the following regulations.

742.211 Siltation structures will be constructed using the best technology currently available to prevent additional

contributions of suspended solids and sediment to streamflow outside the permit area to the extent possible. Sediment control structures and details are discussed in Appendix 7-4.

742.212 The siltation structures (i.e. sediment ponds) will be constructed prior to any coal mining and reclamation operations. Upon construction, the ponds and any other siltation structures will be certified by a qualified registered professional engineer to be constructed as designed and approved in the reclamation plan.

742.213 The sediment ponds will be designed, constructed and maintained in accordance with all applicable regulations. See 732.200, 733.200 and Appendix 7-4 for details.

742.214 Any discharge of water from underground workings to surface waters will meet applicable effluent limitations of 751. If such water is found not to meet those requirements, the water will be treated underground prior to discharge, or passed through a siltation structure prior to leaving the permit area.

742.220 Sedimentation Ponds The sedimentation ponds will meet the following criteria:

742.221.1 The ponds will be used individually;

742.221.2 The ponds are located at the lower end of the disturbed area and out of any perennial stream (See Plate 7-5);

742.221.3 The sediment ponds will be designed, constructed and maintained to:

742.221.31 The ponds are designed to contain the runoff from a 10 year - 24 hour precipitation event for the area in addition to a minimum of 2 years of sediment storage.

742.221.32 The ponds are designed to provide a minimum of 24 hour retention of the runoff from a 10 year - 24 hour precipitation event.

742.221.33 The ponds are designed to contain the runoff from a 10 year - 24 hour precipitation event plus a minimum of 2 years of sediment storage.

742.221.34 A nonclogging dewatering devices are provided as described in Appendix 7-4.

742.221.35 This will be accomplished by proper design, construction and maintenance of the ponds as described in Appendix 7-4.

742.221.36 As discussed in Appendix 7-4, sediment will be removed when the level reaches the 2 year storage level. Since the ponds are oversized, this leaves adequate room for storage of the design event.

742.221.37 The sediment ponds' construction ensures against excessive settlement. See "Sediment Pond Construction Requirements" in Appendix 7-4.

742.221.38 Sediment ponds will be free of sod, large roots, frozen soil, and acid- or toxic-forming coal processing waste. See "Sediment Pond Construction Requirements" in Appendix 7-4.

742.221.39 The sediment ponds will be compacted properly. See "Sediment Pond Construction Requirements" in Appendix 7-4.

742.222 Sediment Ponds Meeting MSHA Criteria The proposed ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a). Therefore, this section is not applicable.

742.223 Sediment Ponds Not Meeting MSHA Criteria As discussed in Appendix 7-4, the ponds will be equipped with principle spillway and emergency spillway culverts each

sized to safely discharge runoff from a 25 year - 6 hour precipitation event.

742.223.1 The Principle Spillway culverts and the Emergency Spillway culverts will be corrugated, metal pipe. Each one designed to carry sustained flows.

742.223.2 N/A - See 742.223.1

742.224 N/A - See 742.223.1

742.225 N/A - No exception requested.

742.225.1 N/A

742.225.2 N/A

742.230 Other Treatment Facilities No other treatment facilities are planned for this operation. Therefore, Section 742.230 is not applicable.

742.240 Exemptions No exemptions are requested at this time; however, since this is a new proposed operation, the need for Small Area Exemptions and/or Alternate Sediment Control Areas may arise in the future.

742.300 Diversions

742.310 General Requirements

742.311 All diversions are considered temporary, and will be removed upon final reclamation.

Diversions are designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public detailed diversion designs are presented in Appendix 7-4 of this P.A.P.

742.312 See Appendix 7-4 for diversion designs.

742.313 As indicated, all diversions for the Lila Canyon Mine are temporary, and will be removed when no longer needed. Land disturbed by removal will be reclaimed in accordance with R645-301 and R645-302. Prior to diversion removal, downstream water treatment facilities will be modified or removed. See Reclamation Hydrology Section of Appendix 7-4.

742.320 Diversion of Perennial and Intermittent Steams Section 742.320 is not applicable since there are no diversions planned for perennial or intermittent streams within the permit area.

742.330 Diversion of Miscellaneous Flows All diversions within the permit area are of miscellaneous flows.

742.331 Certain miscellaneous undisturbed flows are proposed to be diverted around the disturbed area. Other flows are diverted within the disturbed area and to the sediment ponds, as described in Appendix 7-4.

742.332 See Appendix 7-4.

742.333 All temporary diversions are designed to safely pass the peak runoff of a 10-year 6-hour event resulting in a more robust design that the required 2-year 6-hour precipitation event. See Appendix 7-4 for details.

742.400 Road Drainage

742.410 All Roads All roads are designed in accordance with requirements of 534. Drainage control for all roads is discussed in detail in Appendix 7-4. No part of any road is planned to be located in the channel of an intermittent or perennial stream. As shown on Plate 7-2, roads are located to minimize downstream sedimentation and flooding.

742.420 Primary Roads Primary road design is discussed under 534.

742.421 As described in Section 534, all primary roads are to be located, insofar as practical, on the most stable available surfaces.

742.422 There are no stream fords planned for this operation.

742.423 Drainage Control Road drainage control is discussed in Appendix 7-4.

742.423.1 Primary roads will be equipped with adequate drainage control, including ditches, culverts and relief drains. The drainage control system is designed, and will be constructed and maintained, to pass the peak runoff safely from a 10 year - 6 hour precipitation event, as described in Appendix 7-4.

742.423.2 Culvert design and installation details are described in Appendix 7-4. Inlets and outlets are protected from erosion. Undisturbed culvert inlets are to be equipped with trash racks.

742.423.3 Drainage ditch design details are provided in Appendix 7-4.

742.423.4 There are plans to alter the drainage channel on the south boundary of the disturbed area. This drainage is an ephemeral channel with no riparian habitat. A stream alteration permit will not be required for this channel. A 60 inch culvert and a sedimentation pond will be placed in this channel. Installation of this culvert and sedimentation control plans are described in Appendix 7-4. To ensure that state of the art technology is incorporated, the final reclamation plans for the sedimentation pond area will be submitted prior to commencement of final reclamation of this area.

742.423.5 Stream channel crossings will be provided by culverts designed, constructed and maintained using current, prudent engineering practice, as described in Appendix 7-4.

743. Impoundments

743.100 General Requirements All impoundments associated with this operation are considered temporary.

743.110 Not applicable there are no impoundments planned that meet the criteria of MSHA, 30 CFR 77.216 (a).

743.120 The design of impoundments have been prepared and certified by a qualified, registered professional engineer. As described in Appendix 7-4, the proposed sediment ponds will have at least 2' of freeboard above the highest flow level in the emergency spillway, which is adequate to resist overtopping by waves and by sudden increases in storage volumes.

743.130 As described in Appendix 7-4, the sediment ponds will be equipped with a culvert riser principal spillway and a culvert riser emergency overflow sized to safely pass the runoff from a 25 year - 6 hour precipitation event.

743.131 The principal spillway design is discussed below.

743.131.1 The principle spillway will be constructed of corrugated metal pipe. The emergency spillway will also be constructed of corrugated metal pipe.

744. Discharge Structures

744.100 The sediment ponds' emergency spillways will be a vertical corrugated metal pipe. For Sediment Pond 1, it will flow into the UC-1* C.M.P. beneath the pond and discharge onto an engineered rip-rap apron to prevent scouring or erosion. For Sediment Pond 2, the discharge will be via C.M.P. (See Appendix 7-4).

*UC-1 was abandoned in the fall of 2016 due to severe storm damage. A new culvert UC-1a was constructed to replace it. Both will be reclaimed during final reclamation. Full details can be found in Appendix 7-4.

Diversions and culvert outlets that are expected to have flow velocities in excess of 5 fps will also be equipped with erosion and velocity controls as described in Appendix 7-4.

744.200 Discharge structures have been designed and certified according to standard engineering design procedures. (See Appendix 7-4).

745. Disposal of Excess Spoil Section 745 is not applicable since there are no plans for disposal of excess spoil at the Lila Canyon operation.

746. Coal Mine Waste The area designated for coal mine waste disposal is within an existing depression area which is located beneath and around the proposed coal storage pile area as shown on Plates 5-2, 7-2 and 7-5. This disposal area will be used for disposal of the rock slope material, reject from coal processing, coal contaminated waste from the mine (i.e. roof falls, etc.) and/or sediment pond waste.

The designated waste area will be within the disturbed area and drained to the sediment pond, and will be constructed according to Division and MSHA requirements. Coal mine waste disposal is discussed in detail under Section 536 of this permit.

746.100 General Requirements

746.110 All coal mine waste will be placed in a new disposal area within the permit area as discussed in Section 536 and 746.

746.120 The area selected for coal mine waste disposal will drain to the sediment pond for final treatment to minimize adverse effects on the surface and ground water quality and quantity. (See Plates 7-2 and 7-5).

746.200 Refuse Piles. The refuse area is described under Coal Mine Waste in Section 746 and detailed in Section 536. Rock slope material will be used as fill and is referred to as refuse. No coal refuse pile is anticipated. Other than described in Section 536.

746.210 In the event a refuse pile is needed for future operations the refuse piles would be designed to meet the requirements of the above listed Division regulations as well as applicable MSHA regulations. See Section 536 for details.

746.211 The coal mine waste disposal areas will not be located in an area containing springs, seeps or water courses. As shown on Plates 5-2 and 7-5 and described in Appendix 7-4, runoff from the areas will be drained to the sediment pond.

746.212 As described in Sections 536 and 746, the coal refuse will be placed within the mine workings, rock slope material will be placed in existing depression areas. These areas are below grade and will drain to the sediment pond. Due to the location (below grade) no berms or diversion ditches are planned for the Coal Mine Waste Area. See Appendix 7-4 for hydrologic details.

746.213 Not applicable since there are no underdrains planned for this pile.

746.220 Surface Area Stabilization

746.221 The plan for revegetation of the area is discussed in Section 536.

746.222 There are no plans for any permanent impoundments on the refuse or Coal mine waste area. Small depressions may exist for a short time until regrading is completed. These depressions are normally less than one foot in depth and not left for more than 30 days.

746.300 This section is not applicable since there are no plans to construct any impounding structures of coal mine waste or to impound coal mine waste.

746.400 This section is not applicable since there are no plans to return coal processing waste to abandoned underground workings.

747. Disposal of Noncoal Waste. Disposal of non-coal mine waste is discussed under Section 528.330 of this permit.

747.100 As indicated in Section 528.330, non-coal mine waste will be stored in a controlled manner in a designated area on site. Final disposal of all noncoal mine waste , except concrete during reclamation, will be in a state-approved solid waste disposal area (E.C.D.C.).

747.200 As shown on Plates 5-2 and 7-5, the proposed noncoal mine waste storage area is in a designated site, free of springs or seeps, and drained to the sediment pond.

747.300 There are no plans to dispose of noncoal mine waste within the permit area, except concrete during reclamation. The concrete will be buried beneath a minimum of 2' of non-acid, non-toxic material, and will not degrade surface or ground water.

748. Casing and Sealing of Wells There are only three ground water piezometers on the site IPA-1, IPA-2 and IPA-3. They will be reclaimed according to the requirements of the Division's Performance Standards. If any additional wells are required in the future, requirements of this section will be met.

750. Performance Standards

751. Water Quality Discharges of water from this operation will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U. S. Environmental Protection Agency set forth in 40 CFR Part 434. See Sections 731 and 742.

The current General UPDES Permit allows one million gallons of discharge (total) from Sediment Pond #1 and from the Mine Portal into Grassy Wash. Emery County Coal Resources, Inc. is considering an individual permit for the potential of increased volume of mine portal water discharge. Emery County Coal Resources, Inc. will inform the Division if/when an individual permit is issued.

752. Sediment Control Measures Sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs described under Sections 732, 742, 760 and Appendix 7-4.

752.100 Siltation Structures Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs described under Sections 732, 742, 763 and Appendix 7-4.

752.200 Road Drainage Roads will be located, designed, constructed, reconstructed, used, maintained and reclaimed as described under Sections 732.400, 742.400 and 762.

752.210 Control or Prevent Erosion See Section 742.400 and Appendix 7-4.

752.220 Control or Prevent Additional Disturbance See Section 742.400 and Appendix 7-4.

752.230 Effluent Standards See Section 742.400 and Appendix 7-4.

752.240 Degradation of Ground Water Systems See Section 742.400 and Appendix 7-4.

752.250 Altering Normal Flow of Water See Section 742.400 and Appendix 7-4.

753. Impoundments and Discharge Structures Impoundments and discharge structures will be located, maintained, constructed and reclaimed as described in Sections 733, 734, 743, 745, 760 and Appendix 7-4.

754. Disposal of Excess Spoil, Coal Mine Waste and Noncoal Mine Waste Disposal areas for excess spoil, coal mine waste and noncoal mine waste will be located, maintained, constructed and reclaimed to comply with Sections 735, 736, 745, 746, 747 and 760.

755. Casing and Sealing of Wells Not applicable since no wells are planned for this site. The three Piezometers will be reclaimed according to the requirements of the Division's Performance Standards.

760. Reclamation Reclamation hydrology is detailed in Appendix 7-4.

761. General Requirements Upon completion of operations, the disturbed area will be reclaimed. All drainage and sediment controls are considered temporary and will be removed when no longer required. The sediment ponds will remain in place until Phase II Bond Release requirements have been met. At that time, the ponds will be removed and the areas will be reclaimed in accordance with the approved plan.

762. Roads All roads within the disturbed area are temporary, and will be removed and reclaimed upon completion of operations. The County road will be left in place to reach the sediment pond and for public use. This road will be removed and reclaimed when the sediment pond is removed

or remain according to the recommendations of the Bureau of Land Management (BLM).

762.100 Upon removal of roads, culverts and diversions will also be removed and the natural drainage patterns will be restored.

762.200 Cut and fill slopes will be reshaped according to the approved reclamation plan. This reshaping will be compatible with the postmining land use and will complement the drainage pattern of the surround terrain. Road reclamation is described in Section 550.

763. Siltation Structures. See Appendix 7-4 for details on removal of siltation structures.

763.100 Siltation Structures will be Maintained. As indicated in Section 761, the sediment ponds will remain in place until the stability and vegetation requirements for Phase II Bond Release are met. This will be a minimum of 2 years after the last augmented seeding. At this time, the ponds will be removed and the area reclaimed.

763.200 Structure is Removed Upon removal of the sediment ponds, the area will be regraded and revegetated in accordance with the approved reclamation plan and Sections 358, 356 and 357.

764. Structure Removal A timetable for reclamation activities is provided in Section 542.100.

765. Permanent Casing and Sealing of Wells There are only three ground water piezometers on the site IPA-1, IPA-2 and IPA-3. They will be reclaimed according to the requirements of the Division's Performance Standards. If any additional wells are required in the future, requirements of this section will be met.

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Part V No. 1

A-3 Complete this item for each entity listed in the corporate structure.

Name of Entity: Emery County Coal Resources, Inc. Pg.1
Mailing Address 46226 National Road
Street Address(if mailing address is a Post Office box)
City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1504720 Ownership/Control relationship to Permittee:

NOTE: -If entity is a SOLE PROPRIETORSHIP, list owner
-if entity is a PARTNERSHIP, list all partners, including limited partners
-If entity's legal structure is other than a sole proprietorship or partnership, list all owners or stockholder's owners ten percent (10%) or more or any class of voting stock; all officers such as President, Vice President, Secretary, Treasurer, Directors; any other person performing a function similar; and for limited liability companies, all members and managers.

Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
ACNR Mining Corporation			46226 National Road, St. Clairsville, Ohio 43950		85-1468710		Owner – 100%		6/11/2020		Open
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Director		6/11/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Chief Executive Officer		6/11/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Secretary		6/11/2020		9/11/2020
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Vice President and Asst. Secretary		7/27/2020		9/11/2020
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Susan Ferris			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7416		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jacob Roelen			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5232		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Robert Putsock			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8460		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Michael Denning			46226 National Road, St. Clairsville, OH 43950		XXX-XX-6164		Vice President and Asst. Secretary		7/27/2020		9/11/2020

Part V No. 1

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Name of Entity: Emery County Coal Resources, Inc. Pg.2
Mailing Address 46226 National Road
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City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1504720 Ownership/Control relationship to Permittee:

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Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
Robert D. Moore			46226 National Road, St. Clairsville, Ohio 43950		XXX-XX-9703		Director		9/11/2020		Open
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		President		9/11/2020		Open
Anthony C. Vcelka, II			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5311		Treasurer		9/11/2020		Open
F. Andrew Balcar			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8262		Secretary		9/11/2020		Open
Guy Shelledy			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7737		Vice President, Engineering		9/11/2020		Open

Part V No. 1

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Name of Entity: ACNR Mining Corporation Pg.1
Mailing Address 46226 National Road
Street Address(if mailing address is a Post Office box)
City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1468710 Ownership/Control relationship to Permittee:

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Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
American Consolidated Natural Resources, Inc.			46226 National Road, St. Clairsville, Ohio 43950		85-1621594		Owner – 100%		6/11/2020		Open
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Director		6/11/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Chief Executive Officer		6/11/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Secretary		6/11/2020		9/11/2020
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Vice President and Asst. Secretary		7/27/2020		9/11/2020
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Susan Ferris			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7416		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jacob Roelen			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5232		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Robert Putsock			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8460		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Michael Denning			46226 National Road, St. Clairsville, OH 43950		XXX-XX-6164		Vice President and Asst. Secretary		7/27/2020		9/11/2020

Part V No. 1

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City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
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Robert D. Moore			46226 National Road, St. Clairsville, Ohio 43950		XXX-XX-9703		Director		9/11/2020		Open
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		President		9/11/2020		Open
Anthony C. Vcelka, II			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5311		Treasurer		9/11/2020		Open
F. Andrew Balcar			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8262		Secretary		9/11/2020		Open
Guy Shelledy			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7737		Vice President, Engineering		9/11/2020		Open

Part V No. 1

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Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
Murray American Consolidated Natural Resources Holding, Inc.			46226 National Road, St. Clairsville, Ohio 43950		85-1621749		Owner – 100%		3/13/2020		Open
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Director		3/13/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Chief Executive Officer		3/13/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Secretary		3/13/2020		9/11/2020
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Vice President and Asst. Secretary		7/27/2020		9/11/2020
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Susan Ferris			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7416		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jacob Roelen			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5232		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Robert Putsock			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8460		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Michael Denning			46226 National Road, St. Clairsville, OH 43950		XXX-XX-6164		Vice President and Asst. Secretary		7/27/2020		9/11/2020

Part V No. 1

A-3 Complete this item for each entity listed in the corporate structure.

Name of Entity: American Consolidated Natural Resources, Inc. Pg.2
Mailing Address 46226 National Road
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City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1621594 Ownership/Control relationship to Permittee:

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Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
Robert D. Moore			46226 National Road, St. Clairsville, Ohio 43950		XXX-XX-9703		Director		9/11/2020		Open
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		President		9/11/2020		Open
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Chief Executive Officer		9/11/2020		Open
Anthony C. Vcelka			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5311		Treasurer		9/11/2020		Open
F. Andrew Balcar			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8262		General Counsel		9/11/2020		Open
F. Andrew Balcar			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8262		Secretary		9/11/2020		Open
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Chief Financial Officer		9/11/2020		Open
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		Chief Operating Officer		9/11/2020		Open
Paul B. Piccolini			46226 National Road, St. Clairsville, OH 43950		XXX-XX-2971		Vice President, Human Resources		9/11/2020		1/29/2021
Eric Grimm			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8107		Executive Vice President, Operations		9/11/2020		Open
Jason B. Adkins			46226 National Road, St. Clairsville, OH 43950		XXX-XX-XXXX		Vice President, Human Resources		1/29/2021		Open
Dennis E. Watson			46226 National Road, St. Clairsville, OH 43950		XXX-XX-XXXX		Vice President, Government Affairs		11/11/2021		Open

Part V No. 1

A-3 Complete this item for each entity listed in the corporate structure.

Name of Entity: Murray American Consolidated Natural Resources Holdings, Inc.
Mailing Address 46226 National Road
Street Address(if mailing address is a Post Office box)
City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1621749 Ownership/Control relationship to Permittee:

NOTE: -If entity is a SOLE PROPRIETORSHIP, list owner
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Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
ACNR Holdings, Inc.			46226 National Road, St. Clairsville, Ohio 43950		85-1622371		Owner – 100%		3/13/2020		Open
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Director		3/13/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Chief Executive Officer		3/13/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Secretary		3/13/2020		9/11/2020
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Vice President and Asst. Secretary		7/27/2020		9/11/2020
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Susan Ferris			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7416		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jacob Roelen			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5232		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Robert Putsock			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8460		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Michael Denning			46226 National Road, St. Clairsville, OH 43950		XXX-XX-6164		Vice President and Asst. Secretary		7/27/2020		9/11/2020

Part V No. 1

A-3 Complete this item for each entity listed in the corporate structure.

Name of Entity: Murray American Consolidated Natural Resources Holdings, Inc.
Mailing Address 46226 National Road
Street Address(if mailing address is a Post Office box)
City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1621749 Ownership/Control relationship to Permittee:

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Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
Robert D. Moore			46226 National Road, St. Clairsville, Ohio 43950		XXX-XX-9703		Director		9/11/2020		Open
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		President		9/11/2020		Open
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Chief Executive Officer		9/11/2020		Open
Anthony C. Vcelka, II			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5311		Treasurer		9/11/2020		Open
F. Andrew Balcar			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8262		Secretary		9/11/2020		Open
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Chief Financial Officer		9/11/2020		Open
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		Chief Operating Officer		9/11/2020		Open
Paul B. Piccolini			46226 National Road, St. Clairsville, OH 43950		XXX-XX-2971		Vice President, Human Resources		9/11/2020		1/29/2021
Eric Grimm			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8107		Executive Vice President, Operations		9/11/2020		Open
Jason B. Adkins			46226 National Road, St. Clairsville, OH 43950		XXX-XX-XXXX		Vice President, Human Resources		1/29/2021		Open
Dennis E. Watson			46226 National Road, St. Clairsville, OH 43950		XXX-XX-XXXX		Vice President, Government Affffairs		11/11/2021		Open

A-3 Complete this item for each entity listed in the corporate structure.

Name of Entity ACNR Holdings, Inc. Pg.1
Mailing Address 46226 National Road
Street Address(if mailing address is a Post Office box)
City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1622371 Ownership/Control relationship to Permittee

NOTE: -If entity is a SOLE PROPRIETORSHIP, list owner
-if entity is a PARTNERSHIP, list all partners, including limited partners
-If entity's legal structure is other than a sole proprietorship or partnership, list all owners or stockholder's owners ten percent (10%) or more or any class of voting stock; all officers such as President, Vice President, Secretary, Treasurer, Directors; any other person performing a function similar; and for limited liability companies, all members and managers.

Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
GLAS Trust Company, LLC			3 Second Street, Suite 206, Jersey City, NJ 07311		81-4468886		100% owner		3/13/2020		9/16/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Director		3/13/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Chief Executive Officer		3/13/2020		9/11/2020
Martin Reed			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9185		Secretary		3/13/2020		9/11/2020
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Vice President and Asst. Secretary		7/27/2020		9/11/2020
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8372		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Susan Ferris			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7416		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Jacob Roelen			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5232		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Robert Putsock			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8460		Vice President and Asst. Secretary		7/27/2020		9/11/2020
Michael Denning			46226 National Road, St. Clairsville, OH 43950		XXX-XX-6164		Vice President and Asst. Secretary		7/27/2020		9/11/2020

Part V No. 1

A-3 Complete this item for each entity listed in the corporate structure.

Name of Entity ACNR Holdings, Inc. Pg.2
Mailing Address 46226 National Road
Street Address(if mailing address is a Post Office box)
City St. Clairsville State Ohio Zip 43950 Telephone No. 740-338-3100
FEIN No. 85-1622371 Ownership/Control relationship to Permittee

NOTE: -If entity is a SOLE PROPRIETORSHIP, list owner
-if entity is a PARTNERSHIP, list all partners, including limited partners
-If entity's legal structure is other than a sole proprietorship or partnership, list all owners or stockholder's owners ten percent (10%) or more or any class of voting stock; all officers such as President, Vice President, Secretary, Treasurer, Directors; any other person performing a function similar; and for limited liability companies, all members and managers.

Entity Name			Address		SS #/EIN		Title		Beginning Date		End Date
Invesco Oppenheimer Senior Floating Rate Fund			11 Greenway Plaza, Suite 1000, Houston, TX 77046		91-1986511		Owner		9/17/2020		Open
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		President		9/11/2020		Open
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Chief Executive Officer		9/11/2020		Open
Robert D. Moore			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9703		Director		9/11/2020		Open
Anthony C. Vcelka, II			46226 National Road, St. Clairsville, OH 43950		XXX-XX-5311		Treasurer		9/11/2020		Open
F. Andrew Balcar			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8262		Secretary		9/11/2020		Open
Jeremy J. Harrison			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7983		Chief Financial Officer		9/11/2020		Open
James R. Turner, Jr.			46226 National Road, St. Clairsville, OH 43950				Chief Operating Officer		9/11/2020		Open
Paul B. Piccolini			46226 National Road, St. Clairsville, OH 43950		XXX-XX-2971		Vice President, Human Resources		9/11/2020		1/29/2021
Eric Grimm			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8107		Executive Vice President, Operations		9/11/2020		Open
Robert Eugene Murray			46226 National Road, St. Clairsville, OH 43950		XXX-XX-8852		Director		9/11/2020		10/16/2020
Eugene I. Davis			46226 National Road, St. Clairsville, OH 43950		XXX-XX-3004		Director		9/11/2020		10/1/2020
Eugene I. Davis			46226 National Road, St. Clairsville, OH 43950		XXX-XX-3004		Director		10/11/2020		Open
Eugene I. Davis			46226 National Road, St. Clairsville, OH 43950		XXX-XX-3004		Chairman of the Board		10/19/2020		Open
Philip J. Cavatoni			46226 National Road, St. Clairsville, OH 43950		XXX-XX-9733		Director		9/11/2020		9/1/2021
Richard D. Robinson			46226 National Road, St. Clairsville, OH 43950		XXX-XX-3495		Director		9/11/2020		Open
John J Ogden			46226 National Road, St. Clairsville, OH 43950		XXX-XX-2310		Director		9/11/2020		12/14/2021
Lawrence M. Clark, Jr.			46226 National Road, St. Clairsville, OH 43950		XXX-XX-7495		Director		9/11/2020		Open
Raphael Wallander			46226 National Road, St. Clairsville, OH 43950		XXX-XX-1101		Director		10/19/2020		Open
Jason B. Adkins			46226 National Road, St. Clairsville, OH 43950		XXX-XX-XXXX		Vice President, Human Resources		1/29/2021		Open
Dennis E. Watson			46226 National Road, St. Clairsville, OH 43950		XXX-XX-XXXX		Vice President, Government Affairs		11/11/2021		Open

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Price Field Office
125 S 600 W
Price, UT 84501-2833

NOV 30 2021

In Reply Refer To:
2800 (UT-95176)

Certified Mail - Return Receipt
7020 1290 0001 2864 9571

Emery County Coal Resources, Inc.
Attn: Karin Madsen
PO Box 910
East Carbon, UT 84520

DECISION
:
:
Right-of-Way Grant UTU-95176 Issued

Dear Ms. Madsen:

Enclosed is a copy of the right-of-way grant (ROW)—serial number **UTU-95176**—which has been approved by the Bureau of Land Management and issued under authority of Title V of the Federal Land Policy and Management Act of October 21, 1976, as amended through September 1999, (90 Stat. 2776; 43 U.S.C. 1761). The issuance of this ROW grant constitutes a final decision by the Bureau of Land Management in this matter.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4, and the enclosed Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19, 1993) or 43 CFR 2801.10 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Emery County Coal Resources, Inc.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

(1) The relative harm to the parties if the stay is granted or denied;

(2) The likelihood of the appellant's success on the merits;

(3) The likelihood of immediate and irreparable harm if the stay is not granted; and

(4) Whether the public interest favors granting the stay.

Please note that under the regulations in 43 CFR Group 2800, this decision is effective even if an appeal is filed. If you have any questions, please contact Veronica Kratman, Realty Specialist, at the above address, by e-mail at vkratman@blm.gov, or by phone (435) 636-3610.

Sincerely,

Kyle Beagley
Assistant Field Manager
Lands and Minerals

Enclosures

Form 1842-1
(September 2006)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

INFORMATION ON TAKING APPEALS TO THE INTERIOR BOARD OF LAND APPEALS

DO NOT APPEAL UNLESS
1. This decision is adverse to you,
AND
2. You believe it is incorrect

IF YOU APPEAL, THE FOLLOWING PROCEDURES MUST BE FOLLOWED

1. NOTICE OF APPEAL

A person who wishes to appeal to the Interior Board of Land Appeals must file in the office of the officer who made the decision (not the Interior Board of Land Appeals) a notice that he wishes to appeal. A person served with the decision being appealed must transmit the *Notice of Appeal* in time for it to be filed in the office where it is required to be filed within 30 days after the date of service. If a decision is published in the FEDERAL REGISTER, a person not served with the decision must transmit a *Notice of Appeal* in time for it to be filed within 30 days after the date of publication (43 CFR 4.411 and 4.413).

2. WHERE TO FILE

NOTICE OF APPEAL: Bureau of Land Management, Salt Lake Field Office, 2370 South Decker Lake Blvd, West Valley City, Utah 84119

WITH COPY TO SOLICITOR: Regional Solicitor, Room 6201, 125 South State Street, Salt Lake City, Utah 84111

3. STATEMENT OF REASONS

Within 30 days after filing the *Notice of Appeal*, file a complete statement of the reasons why you are appealing. This must be filed with the United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. If you fully stated your reasons for appealing when filing the *Notice of Appeal*, no additional statement is necessary (43 CFR 4.412 and 4.413).

WITH COPY TO SOLICITOR: Regional Solicitor, Room 6201, 125 South State Street, Salt Lake City, Utah 84111

4. ADVERSE PARTIES

Within 15 days after each document is filed, each adverse party named in the decision and the Regional Solicitor or Field Solicitor having jurisdiction over the State in which the appeal arose must be served with a copy of: (a) the *Notice of Appeal*, (b) the Statement of Reasons, and (c) any other documents filed (43 CFR 4.413).

5. PROOF OF SERVICE

Within 15 days after any document is served on an adverse party, file proof of that service with the United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. This may consist of a certified or registered mail "Return Receipt Card" signed by the adverse party (43 CFR 4.401(c)).

6. REQUEST FOR STAY

Except where program-specific regulations place this decision in full force and effect or provide for an automatic stay, the decision becomes effective upon the expiration of the time allowed for filing an appeal unless a petition for a stay is timely filed together with a *Notice of Appeal* (43 CFR 4.21). If you wish to file a petition for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Interior Board of Land Appeals, the petition for a stay must accompany your *Notice of Appeal* (43 CFR 4.21 or 43 CFR 2801.10 or 43 CFR 2881.10). A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the *Notice of Appeal* and Petition for a Stay **must** also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay. Except as otherwise provided by law or other pertinent regulations, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards: (1) the relative harm to the parties if the stay is granted or denied, (2) the likelihood of the appellant's success on the merits, (3) the likelihood of immediate and irreparable harm if the stay is not granted, and (4) whether the public interest favors granting the stay.

Unless these procedures are followed, your appeal will be subject to dismissal (43 CFR 4.402). Be certain that **all** communications are identified by serial number of the case being appealed.

NOTE: A document is not filed until it is actually received in the proper office (43 CFR 4.401(a)). See 43 CFR Part 4, Subpart B for general rules relating to procedures and practice involving appeals.

(Continued on page 2)

Form 2800-14
(August 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RIGHT-OF-WAY GRANT/TEMPORARY USE PERMIT

Issuing Office
Price Field Office

Serial Number
UTU-95176

1 A (right of way) (permit) is hereby granted pursuant to:

a ☑ Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 U.S.C. 1761);

b. ☐ Section 28 of the Mineral Leasing Act of 1920, as amended (30 U.S.C. 185);

c. ☐ Other *(describe)* _____

2 Nature of Interest

a. By this instrument, the holder **Emery County Coal Resources, Inc, PO Box 910, East Carbon, UT 84520** receives a right to construct, operate, maintain, and terminate a **an access road** on public lands (or Federal land for MLA Rights-of-Way) described as follows:

This grant authorizes use of the existing road located on BLM-administered land as follows:

Salt Lake Meridian, Utah
T. 16 S., R. 14 E.,
sec. 3, SE1/4NE1/4SE1/4, N1/2SE1/4;
sec. 10, SW1/4NE1/4, E1/2NW1/4, N1/2SE1/4;
sec. 14, SW1/4NW1/4, N1/2SW1/4, SE1/4SW1/4;
sec. 23, N1/2NE1/4, SE1/4NE1/4;
sec. 24, NW1/4SW1/4, SW1/4SW1/4, SE1/4SE1/4SW1/4;
sec. 25, W1/2NW1/4, NW1/4SE1/4, SW1/4SE1/4.

b. The right-of-way or permit area granted herein is **28** feet wide, **28,618** feet long and contains **18.395** acres, more or less. If a site type facility, the facility contains _____ acres.

c. This instrument shall terminate on **12/31/2051**, **30** years from its effective date unless, prior thereto, it is relinquished, abandoned, terminated, or modified pursuant to the terms and conditions of this instrument or of any applicable Federal law or regulation.

d. This instrument ☑ may ☐ may not be renewed. If renewed, the right-of-way or permit shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the authorized officer deems necessary to protect the public interest.

e. Notwithstanding the expiration of this instrument or any renewal thereof, early relinquishment, abandonment, or termination, the provisions of this instrument, to the extent applicable, shall continue in effect and shall be binding on the holder, its successors, or assigns, until they have fully satisfied the obligations and/or liabilities accruing herein before or on account of the expiration, or prior termination, of the grant.

(Continued on page 2)

3. Rental:

For and in consideration of the rights granted, the holder agrees to pay the Bureau of Land Management fair market value rental as determined by the authorized officer unless specifically exempted from such payment by regulation. Provided, however, that the rental may be adjusted by the authorized officer, whenever necessary, to reflect changes in the fair market rental value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices.

4. Terms and Conditions:

a. This grant or permit is issued subject to the holder's compliance with all applicable regulations contained in Title 43 Code of Federal Regulations parts 2800 and 2880.

b. Upon grant termination by the authorized officer, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as provided in paragraph (4)(d) or as directed by the authorized officer.

c. Each grant issued pursuant to the authority of paragraph (1)(a) for a term of 20 years or more shall, at a minimum, be reviewed by the authorized officer at the end of the 20th year and at regular intervals thereafter not to exceed 10 years. Provided, however, that a right-of-way or permit granted herein may be reviewed at any time deemed necessary by the authorized officer.

d. The stipulations, plans, maps, or designs set forth in Exhibit(s) A, B, C, dated 10/15/2021, attached hereto, are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety.

e. Failure of the holder to comply with applicable law or any provision of this right-of-way grant or permit shall constitute grounds for suspension or termination thereof.

f. The holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and the health and safety of the public.

IN WITNESS WHEREOF. The undersigned agrees to the terms and conditions of this right-of way grant or permit

(Signature of Holder)	(Signature of Authorized Officer)
PRESIDENT	AFM Price BLM
(Title)	(Title)
10-28-2021	11-29-21
(Date)	(Effective Date of Grant)

5. Applicable Laws

   a. The holder shall comply with all Federal, State, and local regulations whether or not specifically mentioned within this grant.

   b. BLM may suspend or terminate your grant if you do not comply with applicable laws and regulations or any terms, conditions, or stipulations of the grant (such as rent payments), or if you abandon the right-of-way. Your failure to use your right-of-way for its authorized purpose for any continuous 5-year period creates a presumption of abandonment.

   c. Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the holder shall obtain from the Field Manager or other authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer. Emergency use of pesticides shall be approved in writing by the authorized officer prior to such use.

   d. The holder of this right-of-way grant or the holder's successor in interest shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of the Interior issued pursuant thereto.

   e. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

   f. The holder shall comply with the construction practices and mitigating measures established by 33 CFR 323.4, which sets forth the parameters of the "nationwide permit" required by Section 404 of the Clean Water Act. If the proposed action exceeds the parameters of the nationwide permit, the holder shall obtain an individual permit from the appropriate office of the Army Corps of Engineers and provide the authorized officer with a copy of same. Failure to comply with this requirement shall be cause for suspension or termination of this right-of-way grant.

   g. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901 et seq.) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way holder's activity on the right-of-way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

   h. The holder is prohibited from discharging oil or other pollutants into or upon the navigable waters of the United States, adjoining shorelines, or the waters of the contiguous zone in violation of Section 311 of the Clean Water Act as amended, 33 U.S.C. 1321, and the regulations issued there under, or applicable laws of the State and regulations issued there under. Holder shall give immediate notice of any such discharge to the authorized officer and such other Federal and State officials as are required by law to be given such notice.

i. As required by law, Holder shall have responsibility for and shall take all action(s) necessary to fully remediate and address the hazardous substance(s) on or emanating from the right-of way area.

6. Miscellaneous
   a. The holder shall designate a representative who shall have the authority to act upon and to implement instructions from the authorized officer. The holder's representative shall be available for communication with the authorized officer within a reasonable time when construction or other surface disturbing activities are underway.
   b. The holder shall permit free and unrestricted public access to and upon the right-of-way for all lawful purposes except for those specific areas designated as restricted by the Field Manager or other authorized officer to protect the public, wildlife, livestock or facilities constructed within the right-of-way.
   c. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
   d. The holder shall inform the Field Manager at (435) 636-3600 within 48 hours of any reportable accidents on federal lands.
   e. All persons who are associated with the project will be informed by the holder that they will be subject to prosecution for disturbing archaeological sites or collecting artifacts. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.
   f. In the event that the public land underlying the right-of-way (ROW) encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the right-of-way, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR Part [2800][2880], including any rights to have the holder apply to BLM for amendments, modifications, or assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the right-of-way, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any disputes concerning compliance with the use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.
   g. The holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the holder shall immediately report the incident, in writing, to the authorized officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If

the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the holder shall be responsible for the survey cost.

h. Every reasonable effort will be made to prevent, control, or suppress any fire in the operation area. Uncontrolled fires must be immediately reported to the Moab Interagency Fire Center (435) 259-1850 (or 911) immediately with the location and status of any escaped fire.

i. The Holder or its contractors will notify the BLM of any fires and comply with all rules and regulations administered by the BLM concerning the use, prevention, and suppression of fires on Federal lands, including any fire prevention orders that may be in effect at the time of the permitted activity. The Holder or its contractors may be held liable for the cost of fire suppression, stabilization, and rehabilitation. In the event of a fire, personal safety will be the first priority of the Holder or its contractors.

j. If during any phase of the operation or termination of the road or related facilities any oil or other pollutant should be discharged road from containers or vehicles impacting Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of holder to control, cleanup, or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting there from, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

7. Construction and Maintenance

a. The holder shall conduct all activities associated with the operation and termination of the right-of-way within the authorized limits of the right-of-way. The authorized limit of the right-of-way is restricted to the travel portion of the road.

b. The Holder shall not initiate any construction or other surface disturbing activities on the right-of-way without the prior written authorization of the authorized officer. Such authorization shall be a written "Notice to Proceed" issued by the authorized officer. Any notice to proceed shall authorize construction or use as therein expressly stated and only for the particular location or use therein described.

c. Equipment and vehicles shall be inspected and cleaned for vegetation matter and seeds prior to entering BLM administered lands. Clothing and animals should also be inspected for vegetation matter and seeds. Vehicles and equipment should be power washed at a commercial facility or other applicable site where invasive species/noxious weeds seeds can be flushed through a waste treatment plant, where seeds will become inert.

d. The holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the plan of development which was approved and made part of this grant. Any relocation, additional construction, or use that is not in accord with the approved plan of development, shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way grant, including all stipulations and approved plan of development, shall be made available on the right-of-way area during construction, operation, and termination to the authorized officer. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.

e. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations). The holder shall be responsible for annual surveys, reporting the results of the surveys to the BLM, and weed control on disturbed areas within the limits of the right-of-way.

f. Holder shall maintain the right-of-way in a safe, usable condition, as directed by the authorized officer.

g. The holder shall survey and clearly mark the centerline and/or exterior limits of the right-of-way.

h. No routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of four inches deep, the soil shall be deemed too wet to adequately support construction equipment

8. Reclamation, Rehabilitation, and Termination

a. Ninety (90) days prior to termination of the ROW, the holder shall contact the authorized officer to arrange a pre-termination conference. This conference will be held to review the termination provisions of the grant.
b. Upon grant termination by the Field Manager or other authorized officer, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as directed in 4(d).

Exhibit B: Plan of Development

Item 7 Response:

Emery County Coal Resources, Inc. is requesting approval of use of a portion of an existing road which currently accesses the Turtle Canyon Area, for access to the proposed borehole located on State Lands that is immediately adjacent to the existing road. ECCR has been requested by UDOGM to install a water monitoring well in Section 36, T 16 S, R 14 E of SLBM. The portion of the road to be used exists as shown on the attached Figure 1.

The road is currently a standard BLM road that is about 40 feet wide and the length of the road that will be used will be approximate 17,455 meters or about 10.85 miles long. This road will not require any maintenance, widening, or grading. It is anticipated that this well will be completed in late 2021 or early 2022 based on the permits with UDOGM and the Division of State Lands.

It is anticipated that the drilling of the monitoring well will take about 1 month. The drilling equipment will consist of the track mounted drilling rig, a water truck, and a pick-up truck. Some materials for the well will be hauled in via flat-bed truck.

After the well is completed, the road will be used for continued access to the monitoring well by ECCR for the duration of the mining and required water monitoring period. It is unknown what that duration will actually be. Typically, it is the life of mining plus 5 to 10 years after mining.

Further, it is anticipated that BLM will continue to maintain the access per standard policy. Thus, no additional road maintenance by ECCR is anticipated until reclamation of the well is required. The road will then need to be used to allow access for equipment for plugging and abandonment of the well. If during the life of the project that BLM does not maintain the road, then ECCR will have authorization to maintain the road on a as-needed basis as currently configured through the life of the project.

Access for long-term monitoring will be limited to the calendar period from April to November, though in reality to the period will be from after snow melt till first significant snows of winter. It is not anticipated that year-round access will be occurring.

As this project is to install and monitor a water well, no products will be produced from the well or transported over the road. The only transport over the road will be for supplies and equipment to drill and complete the monitoring well and then casual access to monitor the well.

A 100' by 100' drill pad will be constructed on State Lands for storage of the drilling equipment, drilling supplies and well casing. No additional temporary work areas are required.

Item 17 response:

The proposed road access would have limited environmental impact.

Air quality and visual impact would be minimal due to the remote site and minimal number of equipment. While the drilling equipment will be located immediately adjacent to the Turtle Canyon Road, the duration of the drilling activity will be about 1 month in length.

Surface water impacts would consist of increased sedimentation and potential spillage/leakage of hydrocarbon products. Streams in the area are ephemeral, so flows are limited to short duration events.

The rest of the time, these drainages are dry. The road use would not impact any of the drainages. Thus, surface water impacts would be minimized.

No groundwater impacts are anticipated as no long-term disturbances are planned. The well drilling would result in a monitoring well completed to monitor the deep groundwater systems in the area.

Noise impact would consist of a short-duration of engine noise resulting from the trucks and drill rig accessing the site and operating on the site. Such short duration is not expected to impact the animals or limited number of people using the area.

The roadway is already disturbed and would only be used for access. Vegetation and soils adjacent to the road are already disturbed and the minor disturbance from road use would not be a significant impact.

Item 18 Response:

Probable effect of the proposed project on wildlife in the area will be limited to roadway use and well construction. There are no fish, marine life, or marine mammals in the project or adjacent areas. Minimal vegetative impact to the grasses and forbs along the edges of the roadway will be affected by roadway use. No threatened or endangered species are known to exist along the project right-of-way.

Exhibit C, Map: UTU-95176

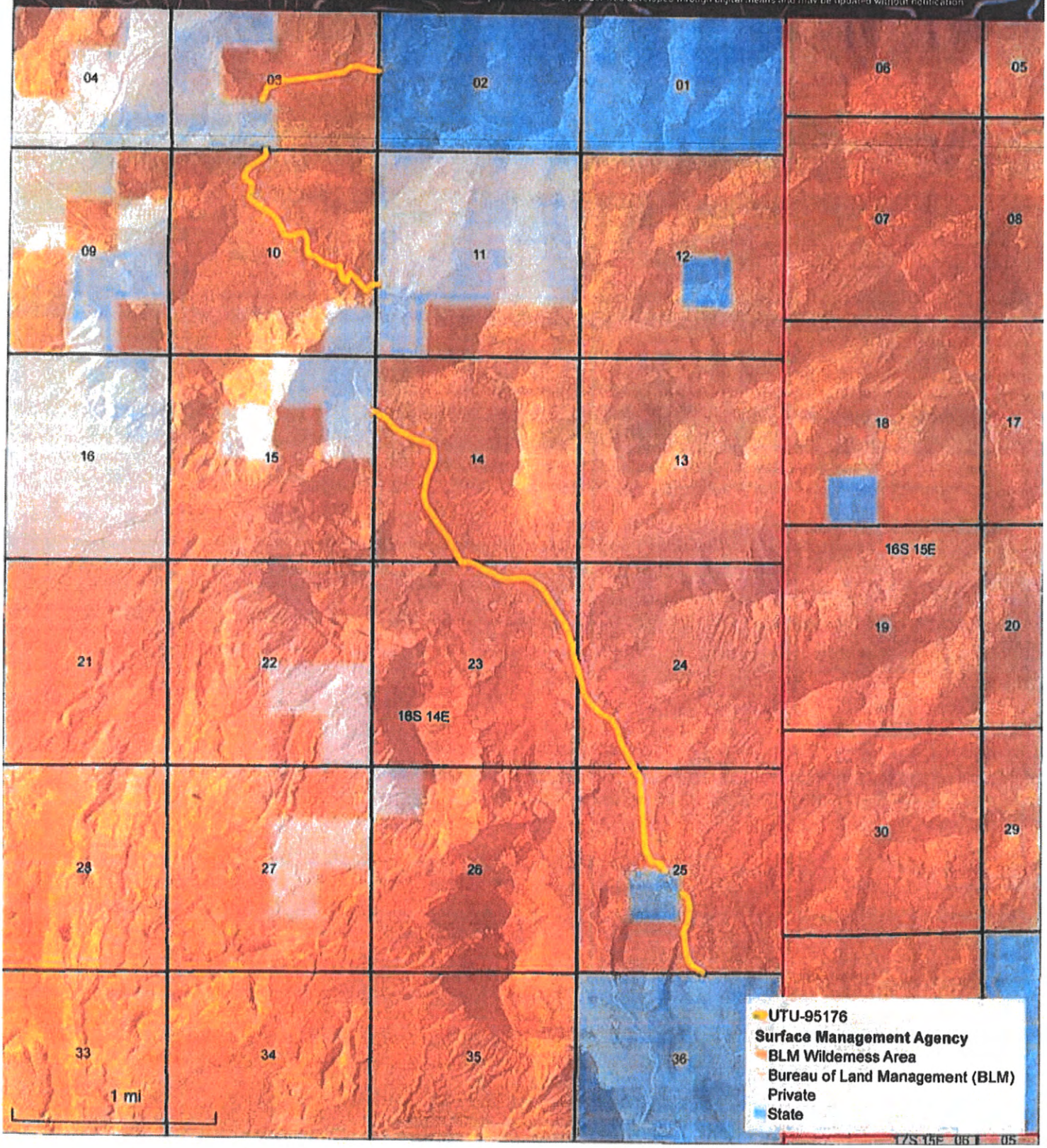
Emery County, UT

Price Field Office
125 S. 600 W.
Price, Utah 84501
435-636-3600

NORTH

10/15/2021

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.



APPENDIX 1-9a

Federal Coal Leases

UNITE STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

COAL LEASE READJUSTMENT

Serial Number SL-066145

Lease Date June 19, 1946

Part I. LEASE RIGHTS GRANTED

This lease, entered into by and between the United States of America, hereinafter called the lessor, through the Bureau of Land Management, and

Intermountain Power Agency
c/o Los Angeles Department of
Water and Power, Room 1107
P. O. Box 111
Los Angeles, CA 90051

hereinafter called lessee, is readjusted, effective June 19, 1996, for a period of 10 years 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 each 10 year lease period.

Sec. 1. This lease readjustment is subject to the terms and provisions of the:

[X] Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

[ ] Mineral Leasing Act for Acquired Lands, Act of August 7, 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. Lessor, in consideration of any rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants 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 following described lands:

T. 16 S., R. 14 E., SLM, Utah
Sec. 3, lots 1-3, 7-11, NESW, SE;
Sec. 4, lot 4;
Sec. 10, E2, E2NW, NESW;
Sec. 11, W2;
Sec. 14, NW;
Sec. 15, N2NE, SENE.

containing 1,552.~~70~~ 17 more or less acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and 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 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 12½ percent of the value of coal produced by strip or auger mining methods and 8 percent of the value of coal produced by underground mining methods. Royalties are due to lessor the final day of the months 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 $5,000. The authorized officer may require an adjustment in the amount of the bond to reflect changed conditions.

Sec. 4. DILIGENCE. This lease is subject to the conditions of diligent development and continued operation, except that these conditions are 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 10 years shall terminate the lease. If not submitted already, lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after the effective date of this lease readjustment.

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). Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval 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 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 Act (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 to 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 specification 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

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

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

[ ] This lease may only be transferred in whole or in pat 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) RELINQUISHMENT. 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 time 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 trails.

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

Sec. 12. HEIRS AND SUCCESSORS - IN-INTEREST. Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall 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.

The following stipulations made part of this lease may be waived or amended with the mutual consent of the lessor and lessee.

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, a Utah program equivalent approved under 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. The permitting of any mining operations on the lease will be subject to the possible designation of any portion of the lease as unsuitable for some or all kinds of surface mining under the regulations of the Department under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) in effect at the time of action on the mine plan permit.

3. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists 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 resources.

If significant cultural resources 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.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective 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 qualified paleontologists 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 brought to his attention 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 tracks commonly encountered during underground mining operations.

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

5. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory 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. A listing of migratory birds of high Federal interest in Federal coal producing regions is published by the Fish and Wildlife Service, Migratory Bird Management Office, Washington, D.C. The inventory shall be conducted by 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 necessary protective mitigating measures shall be borne by the lessee.

6. 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 is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

7. Powerlines on the lease area 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.

8. 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.

9. 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.

10. Except at specifically approved locations, 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, or 3) damage or alter the flow of perennial streams.

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

12. 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 occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a premining land use.

13. The lessee shall be required to pay the value of the royalty on coal left unmined without the authorized officer (AO) approval, which should have been recovered under the approval of a mine plan (Resource Recovery and Protection Plan, [R2P2]) and which would otherwise be lost or left economically inaccessible.

NOTICE

Turtle Canyon Unit

Certain lands within coal lease SL-066145 are included in a citizen's proposal for wilderness in Utah commonly referred to as "HR 1500". The issue of wilderness is highly controversial in Utah, commanding a high level of interest with the Utah Congressional delegation and the Secretary of the Interior. Until the wilderness issue has been resolved by Congress, the Secretary has directed BLM to "pay careful and particular attention to development proposals that could limit Congress' ability to designate certain BLM areas in Utah as wilderness, even though these areas have not formally been designated as wilderness study areas". You are advised to discuss any development proposals with the authorized officer at the earliest possible point in your project planning.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
http://www.blm.gov

IN REPLY REFER TO:
3432
UTSL-066490
(UT-9223)

JUN 10 2011

CERTIFIED MAIL- Return Receipt Requested

RECEIVED
JUN 15 2011
BLM
PRICE, UT

DECISION

UtahAmerican Energy, Inc. 794 North "C" Canyon Road P. O. Box 910 East Carbon, UT 84520	:	Coal Lease UTSL-066490

Coal Lease UTSL-066490 Modified
Extension of Coverage of Surety Bond Accepted

Enclosed is a copy of modified coal lease UTSL-066490 effective on June 1, 2011. The terms and conditions of the original lease are made consistent with the laws, regulations, and lease terms applicable at the time of this modification. The anniversary date of the coal lease remains December 31, 1947.

On June 9, 2011 a surety rider submitted by John P. Yediny, an Attorney-in-Fact for the Rockwood Casualty Insurance Company agreed to extend the coverage of the $120,000 lease bond to the additional modified acreage. This rider is acceptable to extend that coverage and is accepted as of the date of filing.

Please note that rental in the amount of $3.00 per acre, or fraction thereof, or a total of $7,335 is due on the next anniversary date, beginning with December 31, 2011.

Kent Hoffman

Kent Hoffman
Deputy State Director
Lands and Minerals

Enclosures:
Modified Coal Lease (8 pp.)

cc: Price Field Office
Mr. John Baza, Director, UDOGM, Box 145801, Salt Lake City, Utah 84114-5801
ONNR, MRM, Solid Minerals Staff, Attn: Patrick Mulcahy, MS390B2, Box 25165, Denver, CO 80225-0165
John P. Yediny, Rockwood Casualty Insurance Company, 654 Main Street, Rockwood, PA 15557

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial No.___UTSL-066490_

MODIFIED COAL LEASE

Date of Lease_December 31, 1947___

PART I.

THIS MODIFIED COAL LEASE is entered into on June 1, 2011, by and between the **UNITED STATES OF AMERICA**, hereinafter called the Lessor, through the Bureau of Land Management, and

UtahAmerican Energy, Inc.
794 North "C" Canyon Road
P. O. Box 910
East Carbon, UT 84520

hereinafter called Lessee.

This modified lease shall retain the effective date of December 31, 1947 , of the original **COAL LEASE UTSL- 066490**, and is effective for a period of 20 years from the date of issuance of the lease, dated December 31, 1947 and for so long thereafter as coal is produced in commercial quantities from the leased lands, subject to readjustment of lease terms next on October 26, 2015 and at the end of each 10 year lease 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. Lessee as the holder of Coal Lease UTSL- 066490, issued effective December 31, 1947 , were 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.

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 2.



Tract 1:
T. 16 S., R. 14 E., SLM, Utah
Sec. 11, E½;
Sec. 12, W½;
Sec. 13, W½;
Sec. 14, W½, SW¼;
Sec. 15, E½SE¼;
Sec. 22, NE¼NE¼;
Sec. 23, N½, E½SW¼, SE¼;
Sec. 24, NW¼, W½SW¼;
Sec. 26, N½NE¼

Tract 2:
T. 16 S., R. 14 E., SLM, Utah

Sec. 15, SE¼SE¼SW¼SE¼, NE¼NE¼SW¼SE¼.

containing 2,445.00 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.

lease in accordance with, inter alia, Section 39 of the Mineral Leasing Act, 30 U.S.C. 209.

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 20* 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.

* 20 years (Public Law 109-58)

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease bond in the amount of $120,000. The authorized officer may require an increase in this amount when additional coverage is determined appropriate.

Sec. 4. DILIGENCE - This lease has achieved diligent development, and is subject to the conditions of 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.

The Lessor reserves the power to assent to or order the suspension of the terms and conditions of this

Sec. 5. **LOGICAL MINING UNIT (LMU)** – Either upon approval by the Lessor of the Lessee's application or at the direction of the Lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

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.

~~This lease was placed in the Soldier Creek LMU effective March 1, 1996.~~

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

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

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

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

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

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

area shall be submitted to the authorized officer.

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

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

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

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

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

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

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

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

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

Sec. 10. **DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC.** - At such times as all portions of this lease are returned to Lessor, Lessee shall deliver up to Lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all workings in condition for suspension or abandonment. Within 180 days thereof, Lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the Lessor, but Lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the Lessor. If the surface is owned by third parties, Lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when

required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by Lessee's activity or activities incidental thereto, and reclaim access roads or trails.

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

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

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

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

Sec. 15. **SPECIAL STIPULATIONS** -

SEE ATTACHED STIPULATIONS

Utah American Energy, Inc.
Company or Lessee Name

Daniel W. Hlebo
(Signature of Lessee)

President
(Title)

05/31/11
(Date)

The United States of America

BY **Kent Hoffman**

(Signing Officer)

Deputy State Director - Lands & Mineral
(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 UTSL-066490
MODIFIED COAL LEASE

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

2. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists, 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 resources.

If cultural resources 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.

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

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

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

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

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

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

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

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

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

7. The lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal-handling and storage

facilities on the lease area. The migration of road surfacing and subsurface materials into streams and water courses shall be prevented.

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

9. Except at locations specifically approved by the Authorized Officer, 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 (R2P2) 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. 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 (UTSL-066490) Tract 2, 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 the BLM authorized officer will chose a comparable index to 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.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number SL-069291

Lease Date April 1, 1950

COAL LEASE READJUSTMENT

Part I. LEASE RIGHTS GRANTED

This lease, entered into by and between the United States of America, hereinafter called the lessor, through the Bureau of Land Management, and

Kaiser Coal Corporation
102 South Tejon Street
Colorado Springs, CO 80901-2679

hereinafter called lessee, is readjusted, effective April 1, 1990, for a period of 10 years 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 each 10 year lease period.

Sec. 1. This lease readjustment is subject to the terms and provisions of the:

|XX| Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

|___| Mineral Leasing Act for Acquired Lands, Act of August 7, 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. Lessor, in consideration of any rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants 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 following described lands:

T. 16 S., R. 14 E., SLM, Utah
Sec. 24, E½SW¼;
Sec. 25, W½;
Sec. 26, SE¼NE¼, E½SE¼;
Sec. 35, N½NE¼.

containing 600.00 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 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 12½ percent of the value of coal produced by strip or auger mining methods and 8 percent of the value of coal produced by underground mining methods. Royalties are due to lessor the final day of the months 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 $5,000. The authorized officer may require an adjustment in the amount of the bond to reflect changed conditions.

Sec. 4. **DILIGENCE** - This lease is subject to the conditions of diligent development and continued operation, except that these conditions are 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 10 years shall terminate the lease. If not submitted already, lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after the effective date of this lease readjustment.

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)** - Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become a LMU or part of a LMU, subject to the provisions set forth in the regulations.

The stipulations established in a LMU approval in effect at the time of LMU approval 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 times 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 Act (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 to 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 specification 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

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

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

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

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

(b) RELINQUISHMENT - 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 time 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 trails.

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 curring at any other time.

Sec. 12. HEIRS AND SUCCESSORS - IN-INTEREST - Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall 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 ning Control and Reclamation Act of 977 (30 U.S.C. 1201 et seq.)

Sec. 15. SPECIAL STIPULATIONS -

The following stipulations made part of this lease may be waived or amended with the mutual consent of the lessor and lessee.

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, a Utah program equivalent approved under 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. The permitting of any mining operations on the lease will be subject to the possible designation of any portion of the lease as unsuitable for some or all kinds of surface mining under the regulations of the Department under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) in effect at the time of action on the mine plan permit.

3. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by ualified professional cultural resource specialists 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 resources.

If significant cultural resources 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.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective 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 qualified paleontologists 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 brought to his attention 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 tracks commonly encountered during underground mining operations.

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

5. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory 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. A listing of migratory birds of high Federal interest in Federal coal producing regions is published by the Fish and Wildlife Service, Migratory Bird Management Office, Washington, D.C. The inventory shall be conducted by 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 necessary protective mitigating measures shall be borne by the lessee.

6. 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 is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

7. Powerlines on the lease area 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.

8. 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.

9. 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.

10. Except at specifically approved locations, 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, or 3) damage or alter the flow of perennial streams.

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

12. 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 occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a premining land use.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

COAL LEASE READJUSTMENT

Serial Number U-0126947

Lease Date December 1, 1963

Part I. LEASE RIGHTS GRANTED

This lease, entered into by and between the United States of America, hereinafter called the lessor, through the Bureau of Land Management, and

Intermountain Power Agency
c/o Los Angeles Department of Water and Power, Room 1107
P. O. Box 111
Los Angeles, CA 90051

hereinafter called lessee, is readjusted, effective December 1, 1993, for a period of 10 years 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 each 10 year lease period.

Sec. 1. This lease readjustment is subject to the terms and provisions of the:

[X] Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

[ ] Mineral Leasing Act for Acquired Lands, Act of August 7, 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. Lessor, in consideration of any rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants 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 following described lands:

T. 16 S., R. 14 E., SLM, Utah
Sec. 13, E½;
Sec. 24, E½;
Sec. 25, N½NE¼, SE¼NE¼.

T. 17 S., R. 15 E., SLM, Utah
Sec. 5, lots 3, 4;
Sec. 6, lots 1-4.

T. 16 S., R. 15 E., SLM, Utah
Sec. 19, lots 3, 4, SE¼SW¼;
Sec. 29, SW¼SW¼;
Sec. 30, lots 1, 2, E½NW¼, E½SW¼, SE¼SE¼, SW¼NE¼, W½SE¼;
Sec. 31, lot 4, E½, NE¼NW¼, SE¼SW¼.

Emery County, Utah

containing 1,992.15 acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and 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 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 12½ percent of the value of coal produced by strip or auger mining methods and 8 percent of the value of coal produced by underground mining methods. Royalties are due to lessor the final day of the months 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 $6,000. The authorized officer may require an adjustment in the amount of the bond to reflect changed conditions.

Sec. 4. DILIGENCE. This lease is subject to the conditions of diligent development and continued operation, except that these conditions are 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 10 years shall terminate the lease. If not submitted already, lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after the effective date of this lease readjustment.

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). Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval 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 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 Act (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 to 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 specification 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

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

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

[ ] This lease may only be transferred in whole or in pat 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) RELINQUISHMENT. 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 time 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 trails.

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

Sec. 12. HEIRS AND SUCCESSORS - IN-INTEREST. Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall 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.

The following stipulations made part of this lease may be waived or amended with the mutual consent of the lessor and lessee.

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, a Utah program equivalent approved under 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. The permitting of any mining operations on the lease will be subject to the possible designation of any portion of the lease as unsuitable for some or all kinds of surface mining under the regulations of the Department under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) in effect at the time of action on the mine plan permit.

3. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists 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 resources.

If significant cultural resources 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.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective 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 qualified paleontologists 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 brought to his attention 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 tracks commonly encountered during underground mining operations.

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

5. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory 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. A listing of migratory birds of high Federal interest in Federal coal producing regions is published by the Fish and Wildlife Service, Migratory Bird Management Office, Washington, D.C. The inventory shall be conducted by 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 necessary protective mitigating measures shall be borne by the lessee.

6. 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 is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

7. Powerlines on the lease area 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.

8. 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.

9. 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.

10. Except at specifically approved locations, 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, or 3) damage or alter the flow of perennial streams.

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

12. 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 occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a premining land use.

Special Wilderness Study Area Stipulation

No surface occupancy will be allowed in the Turtle Canyon Wilderness Study Area (legal description below) unless it unreasonably interferes with the lessee's right to explore, access, and/or extract the coal resource.

Land description of Turtle Canyon Wilderness Study Area that is located within the land description of Federal coal lease U-0126947 follows:

T. 16 S., R. 14 E., SLM, Utah
Sec. 13, NE¼;
Sec. 24, N½NE¼.

T. 16 S., R. 15 E., SLM, Utah
Sec. 19, lots 3, 4, SE¼SW¼;
Sec. 29, SW¼SW¼;
Sec. 30, SW¼NE¼, W½SE¼, SE¼SE¼.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, UT 84101-1345

JAN 13 2021

In Reply Refer To:
3432 / UT923

CERTIFIED MAIL – RETURN RECEIPT
9489 0090 0027 6180 0892 68

Emery County Coal Resources Inc.
46226 National Road
St. Clairsville, OH 43950

Coal Leases

UTU-014218
UTU-0126947

Approved Coal Lease Modifications
And Submittal of Cost Recovery Estimate
for LMU R2P2 Modification

On January 13, 2021, the Bureau Land Management (BLM) Deputy State Director executed the lease modifications for coal leases UTU-014218 and UTU-0126947. Enclosed are copies of the modified coal leases that are effective on March 1, 2021. The terms and conditions of the original leases are made consistent with the laws, regulations, and lease terms applicable at the time of this modification, including the stipulations from the Lila Canyon Lease Modifications Environmental Assessment Decision Record. The anniversary dates of these coal leases remain February 1, 1955, and December 1, 1963, respectively.

On January 5, 2021, surety company Indemnity National Insurance Company filed a new bond for the North Block Logical Mining Unit (LMU) for the Lila Canyon Mine to extend the coverage for both UTU-014218 and UTU-0126947 in the amount of $1,588,000. The bond was found to be acceptable as of the date of filing. Bonding coverage has been extended to include these lease modifications.

The Bureau of Land Management (BLM) requires that these lands be placed in the North Block LMU or the lands in these modifications will be segregated into a new leases per 43 CFR 3487.1 (f)(3). The BLM has enclosed a preliminary cost estimate to perform this LMU modification. Emery County Coal Resources Inc. must submit the estimated fee $11,500 to process this LMU modification or submit comments to the BLM requesting clarification and/or disputing the estimate. An LMU Resource Recovery Protection Plan (R2P2) modification is required per 43 CFR 3482.2(a)(2). This must be submitted to the Price Field Office, Attn; Erika Tobin, 125 South 600 West, Price, UT, 84501. A hard copy and an electronic copy are required for submittal. Both the estimated processing fee (or comments on the cost estimate) and the R2P2 must be submitted no later than April 1, 2021.

If you have any further questions, please contact Judy Nordstrom at (801) 539-4108 or jnordstr@blm.gov.

Sincerely,

Kent Hoffman
Deputy State Director
Lands and Minerals

Enclosures:
2 Modified Coal Leases
Case by Case (Preliminary Cost Estimate)

cc:
Utah Division of Oil, Gas and Mining -w/o Enclosures
Attn: Coal Program
P.O. Box 145801
Salt Lake City, UT 84114-5801

ONNR, MRM, Solid Minerals Staff - w/1st Enclosure
onrrsolidmineralreferencedata@onrr.gov

Lila Canyon Mine w/Enclosures
P.O. Box 910
East Carbon, UT 84520

Field Office Manager - Price w/Enclosures

bc:
Reading File
JNordstrom:01/13/2021

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial No. UTU-0126947

MODIFIED COAL LEASE

Date of Lease: December 1, 1963

PART I.

THIS MODIFIED COAL LEASE is entered into on March 1, 2021, by and between the **UNITED STATES OF AMERICA**, hereinafter called the Lessor, through the Bureau of Land Management, and hereinafter called Lessee.

Emery County Coal Resources Inc.
46226 National Road
St. Clairsville, OH 43950

This modified lease shall retain the effective date of December 1, 1963, of the original **COAL LEASE UTU-0126947**, and is effective for a period of 20 years from the date of issuance of the lease, dated December 1, 1963, 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 each 10 year lease 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-0126947, issued effective December 1, 1963, were 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.

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 2.

Tract 1:
Salt Lake Meridian, Utah
T. 16 S., R., 14 E.,
sec. 13, E1/2;
sec. 24, E1/2;
sec. 25, N1/2NE1/4, SE1/4NE1/4.
T. 16 S., R., 15 E.,
sec. 19, lots 3, 4, SE1/4SW1/4;
sec. 30, lots 1, 2, E1/2NW1/4, SW1/4NE1/4.
The area described contains 1,059.81 acres

Tract 2:
Salt Lake Meridian, Utah
T. 16 S., R. 15 E.,
sec. 18, S1/2SE1/4SW1/4 and SW1/4SW1/4SE1/4;
sec. 19, lot 2, WI/2NW1/4NE1/4, SE1/4NW1/4NE1/4, E1/2NW1/4, NE1/4SW1/4, SW1/4NE1/4, W1/2NE1/4SE1/4, W1/2SE1/4, and SE1/4SE1/4;
sec. 29, SW1/4NW1/4NW1/4, S1/2NW1/4, SW1/4, SW1/4NW1/4SE1/4, and W1/2SW1/4SE1/4;
sec. 30, N1/2NE1/4, SE1/4NE1/4 and SE1/4.
The area described contains 954.80 acres

containing 2,014.61 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 12 ½ of the value of coal produced by strip or auger mining methods and 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 20* 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.

* 20 years (Public Law 109-58)

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease/LMU bond in the amount of $1,588,000. 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 except that these conditions are 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.

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)** – Either upon approval by the Lessor of the Lessee's application or at the direction of the Lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

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. This lease was placed in the North Block LMU effective March 3, 1999.

Sec. 6. DOCUMENTS, EVIDENCE AND INSPECTION - At such times and in such form as Lessor may prescribe, Lessee shall furnish detailed statements showing the amounts and quality of all

products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

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

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

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

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

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

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

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

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

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

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

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

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

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

(b) **RELINQUISHMENTS** - The Lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon Lessor's acceptance of the

relinquishment, Lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

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

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

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

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

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

Sec. 15. **SPECIAL STIPULATIONS -**

SEE ATTACHED STIPULATIONS

The United States of America

Emery County Coal Resources Inc.
Company or Lessee Name

BY _____

(Signature of Lessee)

(Signing Officer)

PRESIDENT
(Title)

DEPUTY STATE DIRECTOR
(Title)

1-12-2021
(Date)

1/13/2021
(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-0126947
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.

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

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

8. The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data. The monitoring system shall be adequate to locate and quantify, and demonstrate the interrelationship 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. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulation of the surface management agency.

12. 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.

13. 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.

14. 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 C.F.R. § 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 noncompliance issued by the lessor that payment is due under this stipulation is appealable as allowed by law.

15. The lessee, at his expense, will be responsible to replace any surface water sources identified for protection, that may be lost or adversely affected by mining operations, with water from an

alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses (authorized by 26 C.F.R. § 251).

16. 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 C.F.R. § 302.4) or used oil as per Utah State Management Rule R315-15, 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.

17. 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.

18. 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.

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 Office 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.

19. FAIR MARKET VALUE BONUS : Pursuant to 43 C.F.R. § 3432.2(c), "the lands applied for shall be added to the existing lease without competitive bidding, but the United States shall receive the fair market value of the lease of the added lands, either by cash payment or adjustment of the royalty applicable to the lands added to the lease by the modification." The BLM will implement this requirement by adding the bonus obligation owed for mining the coal in these two tracts and it will be reported in addition to the royalty. The lessee will pay the fair market value (FMV) bonus payment for the coal resources produced in the Federal coal lease modifications for Federal Coal Leases UTU-014218 designated as Tract 2 and UTU-0126947designated as Tract 2 on the Federal Coal Lease Form.

The FMV was determined at $0.39 per ton of the actual coal produced. This rate shall be adjusted by the BLM annually (previous 12 months) 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 the bonus shall be at the specified FMV rate ($0.39 per ton) plus the adjustment times the monthly tonnage mined in each tract. This 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 underground royalty of 8% (or approved reduced royalty rate) and the value for the lease bonus payment ($0.39 plus adjustment). The lessee shall notify the BLM when mining has begun on the tracts and the BLM will calculate the adjustment value of the bonus bid shall be for the next 12 months. Each month as part of the production verification, the lessee shall identify to the BLM the amount of coal mined in these 2 tracts as a separate line item the submission.

20. In addition, the lessee shall employ measures that will minimize exposure of the general public to air pollutants exhausting from mine portals/audits. Measures may include the use of fencing or other physical barriers, natural barriers, signage, or other measures that preclude public access to the portals/adits. Persons who require legal or practical access to the air vents, such as mine employees or business invitees and guests of the mine, are not considered members of the general public and would continue to have access to these areas.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

COAL LEASE READJUSTMENT

Serial Number U-014217

Lease Date February 1, 1955

Part I. LEASE RIGHTS GRANTED

This lease, entered into by and between the United States of America, hereinafter called the lessor, through the Bureau of Land Management, and

Intermountain Power Agency
c/o Los Angeles Department of Water and Power
P. O. Box 111
Los Angeles, CA 90051

hereinafter called lessee, is readjusted, effective February 1, 1995, for a period of 10 years 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 each 10 year lease period.

Sec. 1. This lease readjustment is subject to the terms and provisions of the:

[X] Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

[ ] Mineral Leasing Act for Acquired Lands, Act of August 7, 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. Lessor, in consideration of any rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants 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 following described lands:

T. 16 S., R. 14 E., SLM, Utah
Sec. 25, SWNE, SE.
T. 16 S., R. 15 E., SLM, Utah
Sec. 30, lots 3, 4;
Sec. 31, lots 1-3, SENW, NESW.

containing 455.84 acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and 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 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 12½ percent of the value of coal produced by strip or auger mining methods and 8 percent of the value of coal produced by underground mining methods. Royalties are due to lessor the final day of the months 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 $5,000. The authorized officer may require an adjustment in the amount of the bond to reflect changed conditions.

Sec. 4. DILIGENCE. This lease is subject to the conditions of diligent development and continued operation, except that these conditions are 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 10 years shall terminate the lease. If not submitted already, lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after the effective date of this lease readjustment.

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). Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval 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 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 Act (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 to 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 specification 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

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

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

[ ] This lease may only be transferred in whole or in pat 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) RELINQUISHMENT. 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 time 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 trails.

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

Sec. 12. HEIRS AND SUCCESSORS - IN-INTEREST. Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall 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.

The following stipulations made part of this lease may be waived or amended with the mutual consent of the lessor and lessee.

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, a Utah program equivalent approved under 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. The permitting of any mining operations on the lease will be subject to the possible designation of any portion of the lease as unsuitable for some or all kinds of surface mining under the regulations of the Department under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) in effect at the time of action on the mine plan permit.

3. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists 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 resources.

If significant cultural resources 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.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective 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 qualified paleontologists 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 brought to his attention 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 tracks commonly encountered during underground mining operations.

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

5. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory 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~~. A listing of migratory birds of high Federal interest in Federal coal producing regions is published by the Fish and Wildlife Service, Migratory Bird Management Office, Washington, D.C. The inventory shall be conducted by 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 necessary protective mitigating measures shall be borne by the lessee.

6. 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 is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

7. Powerlines on the lease area 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.

8. 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.

9. 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.

10. Except at specifically approved locations, 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, or 3) damage or alter the flow of perennial streams.

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

12. 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 occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a premining land use.

13. The lessee shall be required to pay the value of the royalty on coal left unmined without the authorized officer (AO) approval, which should have been recovered under the approval of a mine plan (Resource Recovery and Protection Plan, [R2P2]) and which would otherwise be lost or left economically inaccessible.

NOTICE

Turtle Canyon Unit

Certain lands within coal lease U-014217 are included in a citizen's proposal for wilderness in Utah commonly referred to as "HR 1500". The issue of wilderness is highly controversial in Utah, commanding a high level of interest with the Utah Congressional delegation and the Secretary of the Interior. Until the wilderness issue has been resolved by Congress, the Secretary has directed BLM to "pay careful and particular attention to development proposals that could limit Congress' ability to designate certain BLM areas in Utah as wilderness, even though these areas have not formally been designated as wilderness study areas". You are advised to discuss any development proposals with the authorized officer at the earliest possible point in your project planning.

U-014217

DILIGENCE REQUIREMENTS

Section 7 of the Mineral Leasing Act of 1920, as amended, subjects all Federal coal leases to diligence provisions. Diligence provisions include complying with diligent development and continued operation requirements. According to these requirements, Federal coal lease U-014217 became subject to diligence by readjustment effective February 1, 1995.

In order for a Federal coal lease to achieve diligent development, it must produce commercial quantities (1 percent of the recoverable reserves) within a 10-year period of the date that it becomes subject to diligence. The diligent development period stops at the end of the royalty reporting period in which production of commercial quantities is achieved or at the end of the 10-year period, whichever comes first.

Once diligent development is achieved, commercial quantities must be produced every year thereafter to maintain continued operation either for the year in question or beginning in the third continued operation year, on the basis of a three year total.

Continued operation can also be satisfied by payment of advance royalty equivalent to the commercial quantities production shortage. This production shortage is based on the year in question or the three-year total, whichever is less. To avoid late payment charges, a lessee must apply to pay advance royalty within 30 days from the beginning of the continued operation year if no production is planned. If production is planned, but falls short of commercial quantities, the lessee must apply to pay advance royalty prior to the end of the continued operation year.

The Bureau of Land Management has determined that Federal coal lease U-014217 contained 5,590,000 tons of coal on the date it became subject to diligence on February 1, 1995. Therefore, the commercial quantities requirement is 55,900 tons. According to our records, no production has taken place on this lease since 1955. Therefore, unless diligence is achieved by February 1, 2005, coal lease U-014217 will terminate pursuant to authority of law.

If you have any questions, please call Stan Perkes in the Utah State Office, at (801) 539-4036.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

COAL LEASE READJUSTMENT

Serial Number U-014218

Lease Date February 1, 1955

Part I. LEASE RIGHTS GRANTED

This lease, entered into by and between the United States of America, hereinafter called the lessor, through the Bureau of Land Management, and

Intermountain Power Agency
c/o Los Angeles Department of Water and Power
P. O. Box 111
Los Angeles, CA 90051

hereinafter called lessee, is readjusted, effective February 1, 1995, for a period of 10 years 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 each 10 year lease period.

Sec. 1. This lease readjustment is subject to the terms and provisions of the:

[X] Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

[ ] Mineral Leasing Act for Acquired Lands, Act of August 7, 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. Lessor, in consideration of any rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants 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 following described lands:

T. 16 S., R. 14 E., SLM, Utah
Sec. 12, E2.

containing 320.00 acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and 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.

Lessee shall keep open at all 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 Act (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 to 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 specification 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.

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 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 12½ percent of the value of coal produced by strip or auger mining methods and 8 percent of the value of coal produced by underground mining methods. Royalties are due to lessor the final day of the months 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 $5,000. The authorized officer may require an adjustment in the amount of the bond to reflect changed conditions.

Sec. 4. DILIGENCE. This lease is subject to the conditions of diligent development and continued operation, except that these conditions are 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 10 years shall terminate the lease. If not submitted already, lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after the effective date of this lease readjustment.

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). Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval 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.

Sec. 9(a) TRANSFERS

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

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

[ ] This lease may only be transferred in whole or in pat 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) RELINQUISHMENT. 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 time 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 trails.

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

Sec. 12. HEIRS AND SUCCESSORS - IN-INTEREST. Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall 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.

The following stipulations made part of this lease may be waived or amended with the mutual consent of the lessor and lessee.

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, a Utah program equivalent approved under 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. The permitting of any mining operations on the lease will be subject to the possible designation of any portion of the lease as unsuitable for some or all kinds of surface mining under the regulations of the Department under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) in effect at the time of action on the mine plan permit.

3. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists 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 resources.

If significant cultural resources 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.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective 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 qualified paleontologists 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 brought to his attention 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 tracks commonly encountered during underground mining operations.

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

5. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory 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. A listing of migratory birds of high Federal interest in Federal coal producing regions is published by the Fish and Wildlife Service, Migratory Bird Management Office, Washington, D.C. The inventory shall be conducted by 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 necessary protective mitigating measures shall be borne by the lessee.

6. 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 is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

7. Powerlines on the lease area 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.

8. 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.

9. 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.

10. Except at specifically approved locations, 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, or 3) damage or alter the flow of perennial streams.

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

12. 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 occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a premining land use.

13. The lessee shall be required to pay the value of the royalty on coal left unmined without the authorized officer (AO) approval, which should have been recovered under the approval of a mine plan (Resource Recovery and Protection Plan, [R2P2]) and which would otherwise be lost or left economically inaccessible.

NOTICE

Turtle Canyon Unit

Certain lands within coal lease U-014218 are included in a citizen's proposal for wilderness in Utah commonly referred to as "HR 1500". The issue of wilderness is highly controversial in Utah, commanding a high level of interest with the Utah Congressional delegation and the Secretary of the Interior. Until the wilderness issue has been resolved by Congress, the Secretary has directed BLM to "pay careful and particular attention to development proposals that could limit Congress' ability to designate certain BLM areas in Utah as wilderness, even though these areas have not formally been designated as wilderness study areas". You are advised to discuss any development proposals with the authorized officer at the earliest possible point in your project planning.

U-014218

DILIGENCE REQUIREMENTS

Section 7 of the Mineral Leasing Act of 1920, as amended, subjects all Federal coal leases to diligence provisions. Diligence provisions include complying with diligent development and continued operation requirements. According to these requirements, Federal coal lease U-014218 became subject to diligence by readjustment effective February 1, 1995.

In order for a Federal coal lease to achieve diligent development, it must produce commercial quantities (1 percent of the recoverable reserves) within a 10-year period of the date that it becomes subject to diligence. The diligent development period stops at the end of the royalty reporting period in which production of commercial quantities is achieved or at the end of the 10-year period, whichever comes first.

Once diligent development is achieved, commercial quantities must be produced every year thereafter to maintain continued operation either for the year in question or beginning in the third continued operation year, on the basis of a three year total.

Continued operation can also be satisfied by payment of advance royalty equivalent to the commercial quantities production shortage. This production shortage is based on the year in question or the three-year total, whichever is less. To avoid late payment charges, a lessee must apply to pay advance royalty within 30 days from the beginning of the continued operation year if no production is planned. If production is planned, but falls short of commercial quantities, the lessee must apply to pay advance royalty prior to the end of the continued operation year.

The Bureau of Land Management has determined that Federal coal lease U-014218 contained 4,070,000 tons of coal on the date it became subject to diligence on February 1, 1995. Therefore, the commercial quantities requirement is 40,700 tons. According to our records, no production has taken place on this lease since 1955. Therefore, unless diligence is achieved by February 1, 2005, coal lease U-014218 will terminate pursuant to authority of law.

If you have any questions, please call Stan Perkes in the Utah State Office, at (801) 539-4036.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, UT 84101-1345

JAN 13 2021

In Reply Refer To:
3432 / UT923

CERTIFIED MAIL – RETURN RECEIPT
9489 0090 0027 6180 0892 68

Emery County Coal Resources Inc.
46226 National Road
St. Clairsville, OH 43950

Coal Leases

UTU-014218
UTU-0126947

Approved Coal Lease Modifications
And Submittal of Cost Recovery Estimate
for LMU R2P2 Modification

On January 13, 2021, the Bureau Land Management (BLM) Deputy State Director executed the lease modifications for coal leases UTU-014218 and UTU-0126947. Enclosed are copies of the modified coal leases that are effective on March 1, 2021. The terms and conditions of the original leases are made consistent with the laws, regulations, and lease terms applicable at the time of this modification, including the stipulations from the Lila Canyon Lease Modifications Environmental Assessment Decision Record. The anniversary dates of these coal leases remain February 1, 1955, and December 1, 1963, respectively.

On January 5, 2021, surety company Indemnity National Insurance Company filed a new bond for the North Block Logical Mining Unit (LMU) for the Lila Canyon Mine to extend the coverage for both UTU-014218 and UTU-0126947 in the amount of $1,588,000. The bond was found to be acceptable as of the date of filing. Bonding coverage has been extended to include these lease modifications.

The Bureau of Land Management (BLM) requires that these lands be placed in the North Block LMU or the lands in these modifications will be segregated into a new leases per 43 CFR 3487.1 (f)(3). The BLM has enclosed a preliminary cost estimate to perform this LMU modification. Emery County Coal Resources Inc. must submit the estimated fee $11,500 to process this LMU modification or submit comments to the BLM requesting clarification and/or disputing the estimate. An LMU Resource Recovery Protection Plan (R2P2) modification is required per 43 CFR 3482.2(a)(2). This must be submitted to the Price Field Office, Attn; Erika Tobin, 125 South 600 West, Price, UT, 84501. A hard copy and an electronic copy are required for submittal. Both the estimated processing fee (or comments on the cost estimate) and the R2P2 must be submitted no later than April 1, 2021.

If you have any further questions, please contact Judy Nordstrom at (801) 539-4108 or jnordstr@blm.gov.

Sincerely,

Kent Hoffman
Deputy State Director
Lands and Minerals

Enclosures:
2 Modified Coal Leases
Case by Case (Preliminary Cost Estimate)

cc:
Utah Division of Oil, Gas and Mining -w/o Enclosures
Attn: Coal Program
P.O. Box 145801
Salt Lake City, UT 84114-5801

ONNR, MRM, Solid Minerals Staff - w/1st Enclosure
onrrsolidmineralreferencedata@onrr.gov

Lila Canyon Mine w/Enclosures
P.O. Box 910
East Carbon, UT 84520

Field Office Manager - Price w/Enclosures

bc:
Reading File
JNordstrom:01/13/2021

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial No. UTU-014218

MODIFIED COAL LEASE

Date of Lease: February 1, 1955

PART I.

THIS MODIFIED COAL LEASE is entered into on March 1, 2021, by and between the **UNITED STATES OF AMERICA**, hereinafter called the Lessor, through the Bureau of Land Management, and hereinafter called Lessee.

Emery County Coal Resources Inc.
46226 National Road
St. Clairsville, OH 43950

This modified lease shall retain the effective date of February 1, 1955, of the original **COAL LEASE UTU-014218**, and is effective for a period of 20 years from the date of issuance of the lease, dated February 1, 1955, 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 each 10 year lease 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-014218, issued effective February 1, 1955, were 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.

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 2.

Tract 1:
Salt Lake Meridian, Utah
T. 16 S., R., 14 E.,
sec. 12, E1/2.
The area described contains 320 acres

Tract 2:
Salt Lake Meridian, Utah
T. 16 S., R., 15 E.,
sec. 7, lot 4;
sec. 18, lots 1 thru 4, W1/2NE1/4NW1/4, W1/2SE1/4NW1/4, SE1/4SE1/4NW1/4, NE1/4SW1/4, and N1/2SE1/4SW1/4;
sec. 19, lot 1.
The area described contains 317.84 acres

containing 637.84 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 12 ½ of the value of coal produced by strip or auger mining methods and 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 20* 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.

* 20 years (Public Law 109-58)

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease/LMU bond in the amount of $1,588,000. 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 except that these conditions are 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.

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)** – Either upon approval by the Lessor of the Lessee's application or at the direction of the Lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

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. This lease was placed in the North Block LMU effective March 3, 1999.

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

Lessee shall keep open at all reasonable times for the inspection of any duly authorized officer of Lessor, the leased premises and all surface and

underground improvements, works, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands. Lessee shall allow Lessor access to and copying of documents reasonably necessary to verify Lessee compliance with terms and conditions of the lease.

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

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

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

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health, or property, and prevention of waste, damage or degradation any land, air, water, cultural, biological, visual, and other resources, including mineral deposits and formations of mineral deposits not leased hereunder, and to other land uses or users.

Lessee shall take measures deemed necessary by Lessor to accomplish the intent of this lease term. Such measures may include, but not limited to, modification to proposed siting or design of facilities, timing of operations, and specifications of interim and final reclamation procedures. Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits not covered hereunder and approving easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of Lessee as may be consistent with concepts of multiple use and multiple mineral development.

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

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor.

Neither Lessee nor Lessee's subcontractors shall maintain segregated facilities.

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

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

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

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

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

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

Sec. 10. **DELIVERY OF PREMISES, REMOVAL OF**

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

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

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

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

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

Sec. 15. **SPECIAL STIPULATIONS -**

SEE ATTACHED STIPULATIONS

The United States of America

Emery County Coal Resources Inc.
Company or Lessee Name

BY _____

(Signature of Lessee)

(Signing Officer)

PRESIDENT
(Title)

DEPUTY STATE DIRECTOR
(Title)

1-12-2021
(Date)

1/13/2021
(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-014218
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.

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

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

8. The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data. The monitoring system shall be adequate to locate and quantify, and demonstrate the interrelationship 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. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulation of the surface management agency.

12. 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.

13. 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.

14. 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 C.F.R. § 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 noncompliance issued by the lessor that payment is due under this stipulation is appealable as allowed by law.

15. The lessee, at his expense, will be responsible to replace any surface water sources identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses (authorized by 26 C.F.R. § 251).

16. 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 C.F.R. § 302.4) or used oil as per Utah State Management Rule R315-15, 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.

17. 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.

18. 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.

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 Office 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.

19. FAIR MARKET VALUE BONUS : Pursuant to 43 C.F.R. § 3432.2(c), "the lands applied for shall be added to the existing lease without competitive bidding, but the United States shall receive the fair market value of the lease of the added lands, either by cash payment or adjustment of the royalty applicable to the lands added to the lease by the modification." The BLM will implement this requirement by adding the bonus obligation owed for mining the coal in these two tracts and it will be reported in addition to the royalty. The lessee will pay the fair market value (FMV) bonus payment for the coal resources produced in the Federal coal lease modifications for Federal Coal Leases UTU-014218 designated as Tract 2 and UTU-0126947designated as Tract 2 on the Federal Coal Lease Form.

The FMV was determined at $0.39 per ton of the actual coal produced. This rate shall be adjusted by the BLM annually (previous 12 months) 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 the bonus shall be at the specified FMV rate ($0.39 per ton) plus the adjustment times the monthly tonnage mined in each tract. This 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 underground royalty of 8% (or approved reduced royalty rate) and the value for the lease bonus payment ($0.39 plus adjustment). The lessee shall notify the BLM when mining has begun on the tracts and the BLM will calculate the adjustment value of the bonus bid shall be for the next 12 months. Each month as part of the production verification, the lessee shall identify to the BLM the amount of coal mined in these 2 tracts as a separate line item the submission.

20. In addition, the lessee shall employ measures that will minimize exposure of the general public to air pollutants exhausting from mine portals/adits. Measures may include the use of fencing or other physical barriers, natural barriers, signage, or other measures that preclude public access to the portals/adits. Persons who require legal or practical access to the air vents, such as mine employees or business invitees and guests of the mine, are not considered members of the general public and would continue to have access to these areas.

APPENDIX 1-9b

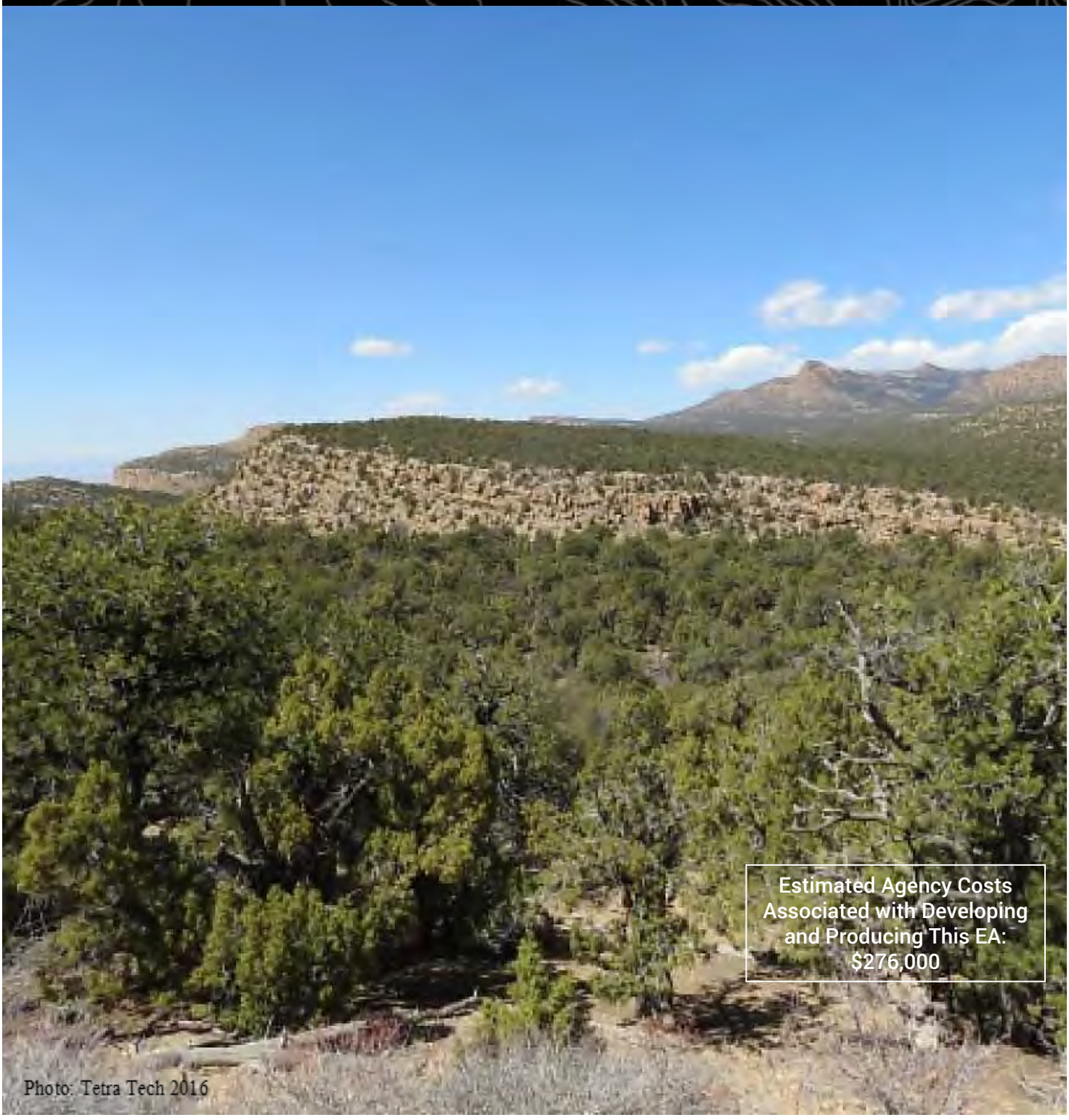
Environmental Assessment
for
Lease Modifications to Federal Coal Leases
#UTU-014218
and
#UTU-0126947

U.S. Department of the Interior
Bureau of Land Management

U.S. Department of the Interior
Office of Surface Mining
Reclamation and Enforcement

Lila Canyon Mine Lease Modifications
Environmental Assessment
Emery County, Utah
DOI-BLM-UT-G020-2018-0039-EA

January 2021



Estimated Agency Costs Associated with Developing and Producing This EA: $276,000

Photo: Tetra Tech 2016

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

LILA CANYON MINE LEASE MODIFICATIONS
ENVIRONMENTAL ASSESSMENT
EMERY COUNTY, UTAH

Prepared for

U.S. Department of the Interior
Bureau of Land Management
Price Field Office
125 South 600 West
Price, Utah 84501
(435) 636-3600

and

U.S. Department of the Interior
Office of Surface Mining Reclamation and Enforcement
(Cooperating Agency)
1999 Broadway, Suite 3320
Denver, Colorado 80202-3050
(303) 293-5088

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ABBREVIATIONS

μg/m^3: micrograms per cubic meter

Act: John D. Dingell, Jr. Conservation, Management, and Recreation Act

AERMOD: American Meteorological Society/Environmental Protection Agency Regulatory Model

APD: application for permit to drill

ASLM: Assistant Secretary of Land and Minerals Management

AQRV: air quality–related value

BBL: barrels

BLM: Bureau of Land Management

CAA: Clean Air Act

CEQ: Council on Environmental Quality

CFR: Code of Federal Regulations

cfs: cubic feet per second

CH_4: methane

CHIA: Cumulative Hydrologic Impact Assessment

CIA: cumulative impact area

CM: continuous miners

CO: carbon monoxide

CO_2: carbon dioxide

CO_2e: carbon dioxide equivalent

DAT: Deposition Analysis Thresholds

DAQ: Utah Division of Air Quality

DOI: U.S. Department of the Interior

DOGM: Utah Division of Oil, Gas and Mining

EA: environmental assessment

EIS: environmental impact statement

EPA: U.S. Environmental Protection Agency

°F: degrees Fahrenheit

FLPMA: Federal Land Policy and Management Act

FONSI: Finding of No Significant Impact

GHG: greenhouse gas

gpm: gallon per minute

GWP: global warming potential

H_2SO_4: sulfuric acid mist

H6H: 6th-highest daily maximum

H8H: 8th-highest daily maximum

HAP: hazardous air pollutant

HI: Hazard Index

HQ: Hazard Quotient

ID: interdisciplinary

km: kilometers

LBA: lease by application

LMA: lease modification application

MEI: most likely exposure (MLE)

MERP: Modeled Emission Rates for Precursors

mg/L: milligrams per liter

MLA: Mineral Leasing Act

MLE: most likely exposure

MMT: million metric tons

MRP: mining and reclamation plan

MSHA: Mine Safety and Health Administration

N_2O: nitrous oxide

NAAQS: National Ambient Air Quality Standards

NEPA: National Environmental Policy Act

NESHAPs: National Emissions Standards for Hazardous Air Pollutants

NO_x: nitrogen oxides

NO_2: nitrogen dioxide

NSPS: New Source Performance Standards

ONRR: Office of Natural Resources Revenue

OSMRE: Office of Surface Mining Reclamation and Enforcement

PAP: permit application package

PFO: Price Field Office

PM: particulate matter

ppb: parts per billion

ppm: parts per million

PSD: Prevention of Significant Deterioration

RCP: representative concentration pathways

RCRA: Resource Conservation and Recovery Act

RfC: Reference Concentrations

REL: Reference Exposure Levels

RMP: resource management plan

R2P2: resource recovery and protection plan

SCC: Social Cost of Carbon

SCT: Savage Coal Terminal

SITLA: School and Institutional Trust Lands Administration

SMCRA: Surface Mining Control and Reclamation Act of 1977

SO: Secretarial Order

SO_2: sulfur dioxide

TDS: total dissolved solids

TPY: tons per year

TSL: toxic screening levels

UAC: Utah Administrative Code

UDEQ: Utah Department of Environmental Quality

UDWQ: Utah Division of Water Quality

UDWS: Utah Department of Workforce Services

UEI: UtahAmerican Energy, Inc.

UPDES: Utah Pollutant Discharge Elimination System

U.S.: United States

USGS: U.S. Geological Survey

USC: United States Code

WSA: Wilderness study area

VOC: volatile organic compound

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CHAPTER 1. PURPOSE AND NEED

1.1 Introduction

This environmental assessment (EA) has been prepared to analyze the potential impacts of UtahAmerican Energy, Inc.'s (UEI) proposed modifications to federal coal leases UTU-014218 and UTU-0126947 in Emery County, Utah (Figure 1-1). UEI is the lessee of these federal leases, which are being developed as part of the Lila Canyon Mine (Mine), an underground coal mine approximately 9 miles southeast of East Carbon, Utah. The proposed lease modification areas are composed of surface lands and federal minerals managed by the U.S. Department of the Interior (DOI), Bureau of Land Management (BLM). A small tract of surface land within the proposed lease modification areas is held by the State of Utah. Under federal law, a lease modification is an addition of lands to an existing lease that is limited to no more than 960 acres or limited to the size of the lease, if less than 960 acres, for the term of the lease. Following approval of an application, lease modifications are issued on a non-competitive basis to the lease holder. UEI's application for federal coal lease modifications was received at the BLM Utah State Office on November 10, 2017, and revised on December 13, 2017. The two proposed lease modification areas, if approved, would add collectively 1,272.64 acres to UEI's federal coal leases and would be mined by underground methods (the project).

This EA is a site-specific analysis of potential impacts that could result from the implementation of the Proposed Action or its alternatives. An EA assists the BLM in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and determining whether any significant impacts could result from the analyzed actions. (*Significance* is defined by Council on Environmental Quality [CEQ] regulations for implementing NEPA and is found in 40 Code of Federal Regulations [CFR] 1508.27). An EA provides evidence for determining whether to prepare a finding of no significant impact (FONSI) or an environmental impact statement (EIS). A FONSI would document the reasons why implementation of the selected alternative would not result in significant environmental impacts beyond those already addressed in the BLM's October 2008 *Price Field Office Record of Decision and Approved Resource Management Plan*, hereinafter referred to as the PFO RMP (BLM 2008). If the agency determines that leasing the proposed Lila Canyon modification areas would result in significant impacts, then an EIS would be prepared for the leasing action. If not, a decision record (DR) may be issued based on the findings and alternatives considered.

1.2 Background

On November 10, 2017, UEI submitted a lease modification application (LMA) to the BLM for the modification of its existing federal coal leases (UTU-014218 and UTU-0126947) in Emery County, Utah. The application was revised to respond to the BLM's decision to amend the legal descriptions of the modified lease tracts to reflect aliquot parts of not less than 10 acres, as defined in 43 CFR 3471.1-1. The revised application was received on December 13, 2017. The application was further revised when it was determined that the acreage limitation for modifying federal coal lease UTU-0126947 (not to exceed 960 acres) had in fact been exceeded by roughly 5 acres. This resulted in the removal of 10 acres from this proposed lease modification on March 8, 2019.

The lease modification areas are contiguous to UEI's existing coal leases and have been determined by the BLM to qualify for consideration under 43 CFR 3432.2(a). Figure 1-2 shows the location of the proposed Lila Canyon lease modification areas in relation to the existing lease areas. UEI currently holds 5,549.01 acres of federal coal contained in six federal leases and 1,280 acres of coal from a Utah School and Institutional Trust Lands Administration (SITLA) lease. The Lila Canyon Mine and Lila Canyon portals are located in T. 16 S., R. 14 E., secs. 10 thru 15 and secs. 22 thru 26, and T. 16 S., R. 15 E., secs. 19 and 30. The Lila Canyon Mine development was approved by the Utah Division of Oil, Gas and Mining (DOGM) in 2007 as an extension to the Horse Canyon Mine. The current DOGM permit area (DOGM Permit # C/007/0013) encompasses 4,663.6 acres. The mining and reclamation plan (MRP) is known as the Horse Canyon MRP in DOGM files. Since 2007, all coal reserves have been accessed through the Lila Canyon portals and UEI would continue to use these portals to access reserves in the proposed lease modification areas. For the remainder of this EA, the Mine is referred to as the Lila Canyon Mine, and the MRP as the Lila Canyon Mine plan.

UEI's purpose in applying for the lease modification areas is to obtain the adjacent coal reserves, thereby 1) satisfying underlying needs of continued coal extraction consistent with applicable state, federal, and local environmental permitting and operational requirements; 2) providing a sufficient return to its investors; and 3) preventing the bypass of valuable federal coal reserves. It should be noted that while the overall resource will increase by approximately 7.2 million tons of recoverable coal reserves, and effectively extend the life of UEI's leases by two to three years, the annual coal production limit will not increase unless UEI applies for and receives a production limit increase from the Utah Division of Air Quality (DAQ).

1.2.1 Current Coal Market

In 2019, U.S. coal production decreased 6.6% from 2018 production levels (U.S. Energy Information Administration 2020). Coal production in the Western region (Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming) decreased 8% from 2018 production levels (U.S. Energy Information Administration 2020). The number of producing mines also decreased to 669 mines from 679 mines in 2018 (U.S. Energy Information Administration 2020). U.S. coal consumption in 2019 declined 14.8% from 2018 consumption levels (U.S. Energy Information Administration 2020). Exports of U.S. produced coal in 2020 decreased 32% from 2019 export levels year to date (U.S. Energy Information Administration 2020).

Most of the coal produced at the Lila Canyon Mine is currently shipped to the Hunter Power Plant in Castle Dale, Utah, and Huntington Power Plant in Huntington, Utah. A portion of the coal produced at the Lila Canyon Mine is also shipped to the Intermountain Power Plant in Delta, Utah. An additional portion of the Lila Canyon Mine coal is sent to other mines in the area for blending purposes to support their contracts. However, market conditions can change, resulting in the coal going to different end users, including the potential for export.

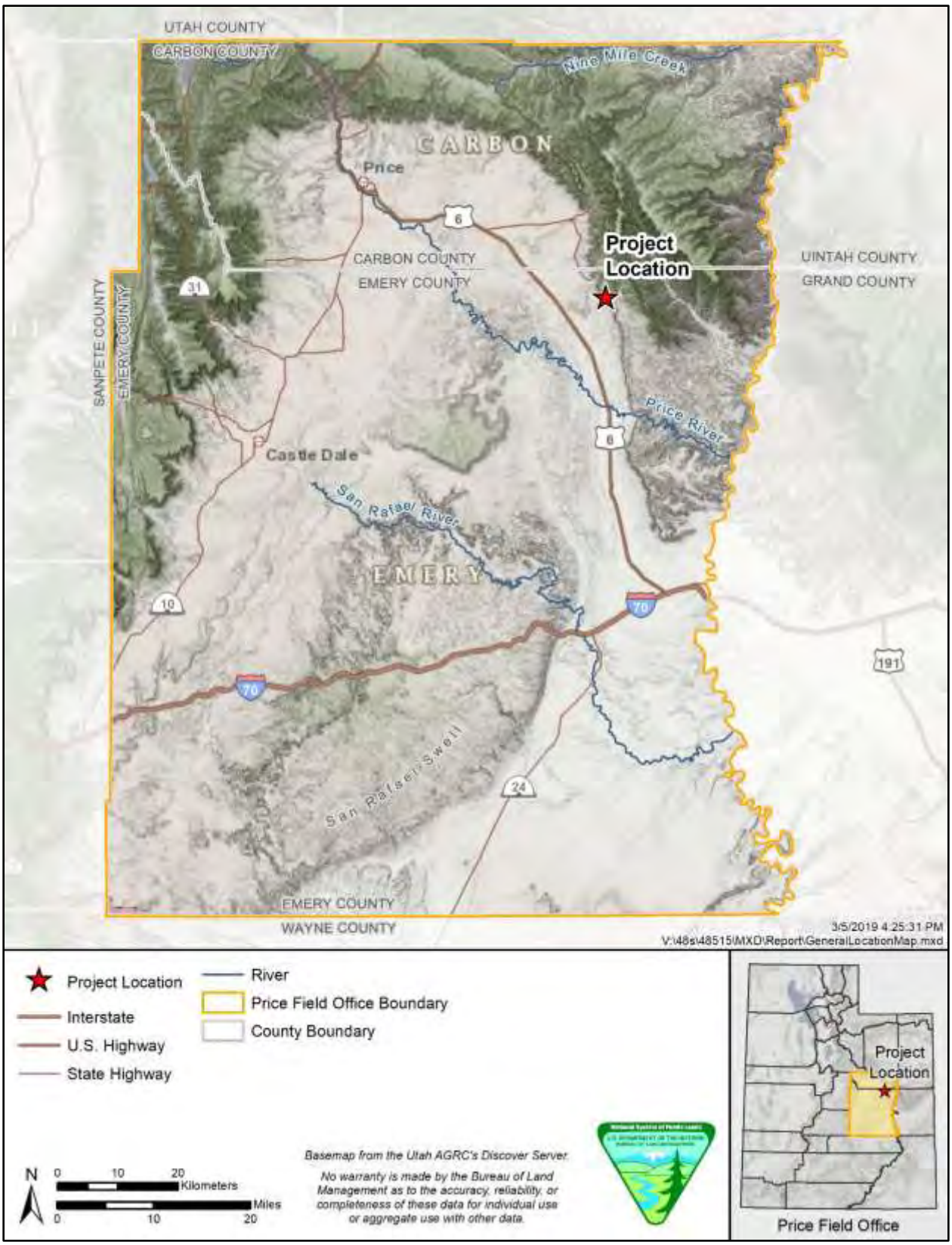


Figure 1-1. General location map.

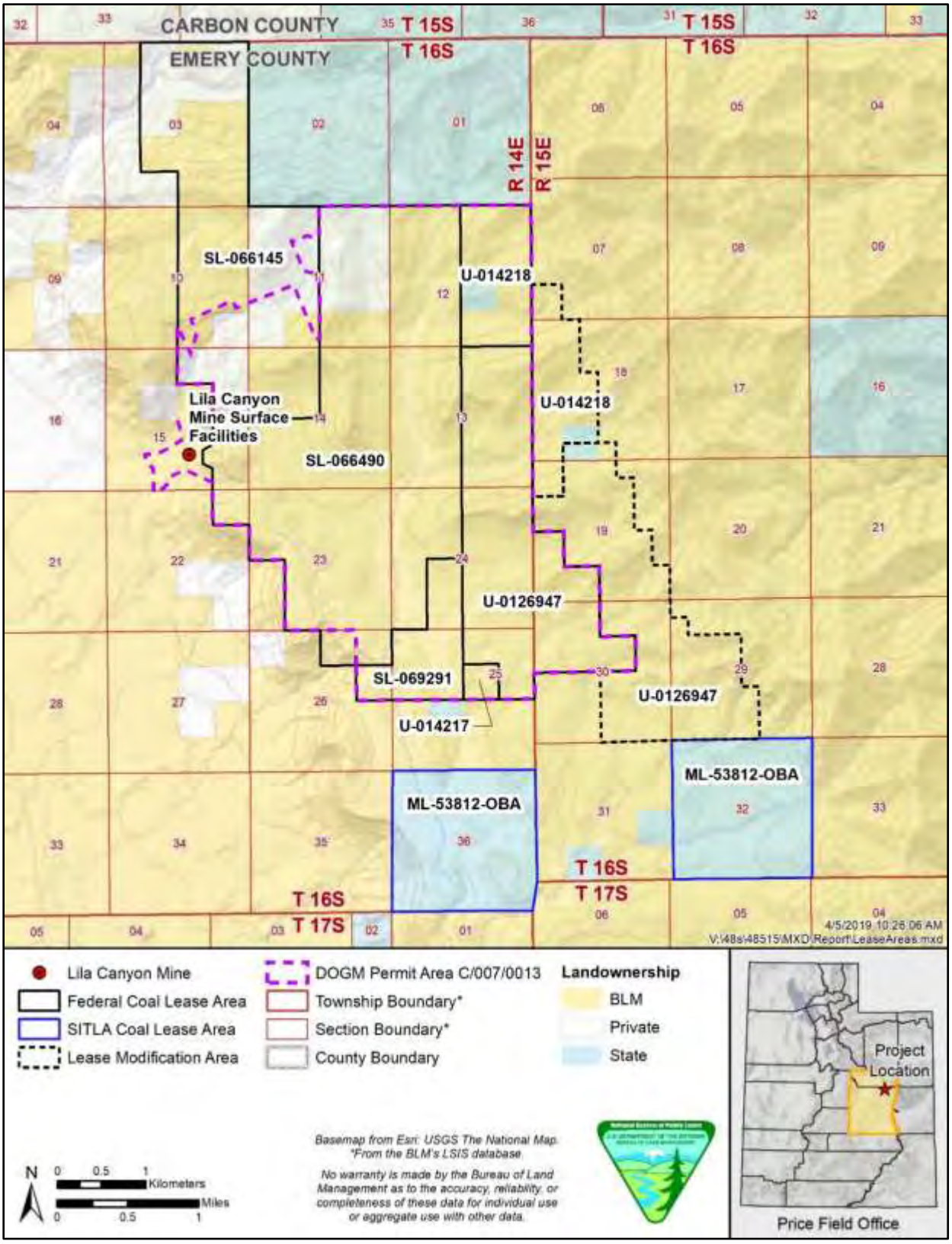


Figure 1-2. Lease modification areas and existing coal leases.

1.3 Purpose and Need for the Action

The purpose of the federal action is to respond to UEI's application to expand two existing leases to add new federal coal reserves on 1,272.64 acres (317.84 acres added to lease UTU-014218 and 954.80 acres added to lease UTU-0126947) of BLM-administered minerals beneath BLM-administered surface lands (other than 39.2 acres where the surface is owned by State of Utah) in Emery County, Utah (see Figure 1-2). The proposed lease modification areas would be added to the Lila Canyon Mine. The need for the action is established by the BLM's responsibility under the Mineral Leasing Act of 1920 (MLA), as amended by the Federal Coal Leasing Amendments Act of 1976, and the Federal Land Policy and Management Act of 1976 (FLPMA), which states that public lands shall be managed in a manner that recognizes the nation's need for domestic sources of minerals (43 United States Code [USC] 1701(a)(12)).

1.4 Decision to be Made

The decision the BLM will make based on this NEPA analysis is whether to lease the federal coal reserves in the proposed modification areas and, if the BLM's decision is to lease, to determine the terms, conditions, and stipulations for issuance of the modified leases. As noted above, lease modifications are issued on a non-competitive basis to the applicant.

1.5 Conformance with BLM Land Use Plan

The PFO RMP was approved in October 2008 and includes goals to provide opportunities for mineral extraction and development to support the need for domestic energy resources (BLM 2008). The PFO RMP allows for such development under mining and mineral leasing laws subject to legal requirements to protect other resource values, including the protection of the long-term health and diversity of public lands. The PFO RMP also includes the objective to "[m]aintain coal leasing, exploration, and development within the planning area while minimizing impacts to other resource values" (BLM 2008:123). The federal coal reserves included in the proposed Lila Canyon lease modification areas are by definition available for leasing and coal mining consideration per 43 CFR 3461.1(a), which states, "federal lands with coal deposits that would be mined by underground mining methods shall not be assessed as unsuitable where there would be no surface coal mining operations." Surface coal mining operations are defined in 43 CFR 3400.0-5 (mm) as "activities conducted on the surface of lands in connection with a surface coal mine or surface operations and surface impacts incident to an underground mine." Decision MLE-2 in the PFO RMP relies upon Map R-24 to show areas available for further coal leasing considerations. Portions of the lease modification areas were not mapped at that time due to RMP Decision MLE-3, which removes wilderness study areas (WSAs) from consideration for coal leasing. At the time the LMA was submitted to BLM, the Turtle Canyon WSA extended into the lease modification areas. With enactment on March 12, 2019, of the John D. Dingell, Jr. Conservation, Management, and Recreation Act (P.L. 116-9) (the Act) (see Section 1.6), there is no longer a Turtle Canyon WSA. The Act designated a new Turtle Canyon Wilderness Area which is not contiguous to and does not encumber the proposed lease modification areas.

The PFO RMP requires modification to remove reference to the Turtle Canyon WSA. However, a plan modification or maintenance action under the PFO RMP is not part of the Proposed

Action for this EA and is not necessary to proceed with the Proposed Action. The PFO RMP Management Decision WSA-7 specifies the following:

> Should any WSA, in whole or in part, be released from wilderness consideration, such released lands will be managed in accordance with the goals, objectives, and management prescriptions established in this RMP, unless otherwise specified by Congress in its releasing legislation. (BLM 2008)

The Act released WSA lands not designated as wilderness under the Act; this release of WSA lands included the portion of the Turtle Canyon WSA that overlapped the proposed lease modifications. The Act specified that WSA lands not designated as wilderness shall be managed in accordance with any applicable management plan adopted under section 202 of FLPMA. The PFO RMP Management Decision MLE-3 specifies that "areas (other than WSAs) will be suitable for leasing." Therefore, the proposed lease modifications are in conformance with the PFO RMP.

1.6 Relationship to Statutes, Regulations, or Other Plans

UEI's application for the lease modification areas will be processed and evaluated under the BLM's statutory mandates and authority governing federal coal leasing and other federal authorities listed below:

- MLA of 1920, as amended by the Federal Coal Leasing Act Amendments of 1976
- Multiple-Use Sustained Yield Act of 1960
- NEPA of 1969, as amended
- FLPMA of 1976 (BLM's multiple-use mandate)
- Surface Mining Control and Reclamation Act (SMCRA) of 1977
- Mining and Minerals Policy Act of 1970
- Energy Policy Act of 2005

1.6.1 Federal Coal Leasing

The federal coal leasing program also includes a requirement that operators mining federal coal achieve maximum economic recovery (MER) of coal from federal leases. The MER requirement has its legislative origins in the Federal Coal Leasing Amendments Act of 1976, which directs that "the Secretary (of Interior) shall evaluate and compare the effects of recovering coal by deep mining, by surface mining, and by any other method to determine which method or sequence of methods achieves the maximum economic recovery of the coal within the proposed leasing tract ... no mining operating plan shall be approved which is not found to achieve the maximum economic recovery of the coal within the tract." The configuration of the Lila Canyon LMA areas will ensure that MER is achieved.

The coal leasing program was paused in January 2016 under the Jewel Order (Secretarial Order [SO] 3338) until completion of a programmatic environmental impact statement (PEIS); this affected the processing of certain federal leases and restricted the issuance of new leases, with several exemptions and exceptions allowing for such leases to be issued as lease modifications, thereby limiting the number of lease applications impacted (BLM 2019).

On March 28, 2017, Executive Order 13783, the Trump Order, directed agency heads to rescind or revise agency actions viewed as burdensome, with attention placed upon coal and other fossil fuels. On March 29, 2017, then-Secretary Ryan Zinke issued SO 3348, the Zinke Order, which rescinded the Jewell Order and effectively restored the previous status quo.

The BLM, in cooperation with the Office of Surface Mining Reclamation and Enforcement (OSMRE), recently prepared the *Lifting the Pause on the Issuance of New Federal Coal Leases for Thermal (Steam) Coal Environmental Assessment* (DOI-BLM-WO-WO02100-2019-0001-EA). The EA responds to the U.S. District Court of Montana's order issued April 19, 2019, in *Citizens for Clean Energy et al. v. U.S. Department of the Interior et al*., 384 F.Supp.3d 1264, 2019 WL 1756296 (D. Mont.), indicating that the Zinke Order constituted a major federal action triggering NEPA compliance. A public comment period was completed on the EA; public comments were considered, and the EA was finalized in early 2020 with a finding that "lifting the Pause and resuming normal leasing practices created no significant, unstudied impacts" (BLM 2020a). The FONSI was signed February 26, 2020.

The BLM has general responsibility to administer the MLA and regulates coal mining operations consistent with approved resource recovery and protection plans (R2P2s) primarily to ensure that conservation of the coal resource is achieved (43 CFR 3480) while maintaining compliance with other applicable laws and regulations. The R2P2 addresses leased coal reserves, including geologic conditions, coal quality, mining methods and operations (43 CFR 3482). The SMCRA authorizes the OSMRE to oversee state and federal programs that approve mine and reclamation plans and regulate the surface effects of coal mining operations.

1.6.2 Utah Division of Oil, Gas and Mining Permitting

Utah has an approved SMCRA permitting program that is implemented by DOGM. Under Section 503 of SMCRA, DOGM developed a permanent program authorizing it to regulate coal mining operations on non-federal lands in Utah (30 CFR 944, Utah Program, including parts 700 and 800). The Secretary of the Interior approved this program in January 1981. In March 1987, pursuant to Section 523(c) of SMCRA, the governor of Utah entered into a cooperative agreement with the Secretary of the Interior authorizing DOGM to regulate coal mining operations on federal lands in the state of Utah (30 CFR 944.30). The Lila Canyon Mine Permit (DOGM Permit # C/007/0013) is currently located on federal lands and was approved in accordance with the cooperative agreement. If the proposed lease modifications are approved, the operator shall be required to submit a permit application package (PAP) to amend the existing DOGM Permit to add the modified lease areas. DOGM will review the amendment under the State Program and will also submit the permit amendment application to OSMRE. In turn, OSMRE will determine whether the SMCRA permit revision requires a federal Mine Plan approval under the MLA. Under the criteria set forth at 30 CFR 746.18, if the lease modification results in more than a 15% increase in the size of the permit area, a federal Mine Plan approval may be necessary. DOGM coordinates with OSMRE to make this decision. When an MLA Mine Plan modification is required, ASLM approval will be required. OSMRE, BLM, and other federal agencies, as appropriate, review the MLA Mine Plan Modification (provided to them by DOGM) to ensure that it complies with the terms of the coal lease (which are based on the disclosures in this NEPA analysis), the MLA, and other federal laws and their attendant regulations (30 CFR 944.30).

The modified lease areas PAP will be submitted to the Assistant Secretary of Land and Minerals Management (ASLM) if OSMRE decides that this is a significant revision and that a federal mine plan approval via the ASLM is required. OSMRE will recommend approval, conditional approval, or disapproval of the MLA mining plan to the ASLM. OSMRE's recommendation must be based, at a minimum, on the following:

- The PAP, including the R2P2, which must be recommended for approval by the BLM, in order for the ASLM to approve.
- Information prepared in compliance with NEPA.
- Documentation ensuring compliance with the applicable requirements of other federal laws, regulations, and executive orders.
- Comments and recommendations or concurrence of other federal agencies, as applicable, and the public.
- The findings and recommendations of the BLM with respect to the R2P2 and other requirements of the lease and the MLA.
- The findings and recommendations of DOGM with respect to the PAP and the state program.
- The findings and recommendations of OSMRE with respect to the requirements under Chapter VII Subchapter D, 30 CFR 746.13 (a–g).

If a decision is made to issue a modified lease, the lessee must obtain mine plan approval and a permit to conduct coal mining operations, including a detailed MRP, before mining can begin on the modification areas. As discussed above, this MRP and overall PAP would undergo detailed review by state and federal agencies as part of the approval process. The detailed PAP would be required to conform to the stipulations and conditions attached to the lease modification through the land use plan and the decision record that would follow this EA. At a minimum, the lease modifications would contain the stipulations which are contained in the two parent leases. While there could be new stipulations specific to the lease modifications, the parent lease stipulations would apply to each associated lease modification.

The conceptual plans for development described in this EA are not final plans but represent reasonably foreseeable development for use in analyzing the potential environmental consequences of issuing a lease for the modification areas, based on current coal markets and current standard coal mining industry operating practices. If the actual mining proposal is different than what is analyzed in this EA, additional NEPA analysis may be necessary. It should be noted, however, that this EA assumes total extraction of the mineable reserve.

If a proposed modification area is leased to the applicant, the lessee is required to revise its coal mining permit (following the processes outlined above) and obtain mining plan approval from the Assistant Secretary prior to mining the newly leased coal. As a part of that process, a new, detailed plan would be developed to outline how the newly leased lands would be mined and reclaimed. Specific impacts that would occur during the mining and reclamation of the modification area would be addressed in the permit approval process, and specific mitigation measures for anticipated impacts would be described in detail at that time.

DOGM enforces the performance standards and permit requirements for reclamation during a mine's operation and reclamation and has primary authority in environmental emergencies (e.g., accidental spills). OSMRE retains oversight responsibility for this permitting and enforcement.

Where federal surface or coal resources are involved, the BLM has authority in environmental emergency situations if DOGM or OSMRE cannot act before environmental harm and damage occurs.

1.6.3 Mine Safety and Health Administration

The Mine Safety and Health Administration (MSHA) monitors and regulates all safety factors related to coal mining on federal and non-federal lands. In preparing this EA, the BLM has a responsibility to consult with and obtain the comments and assistance of other state and federal agencies that have jurisdiction by law or that have special expertise with respect to potential environmental impacts. Depending on the surface involvement of the federal surface management agency (or agencies), concurrence or consent is required from the federal surface agency (or agencies).

Although the BLM makes the decision on whether to lease the modification areas, DOGM has the authority to approve or reject MRPs for coal mines. Thus, if the modification areas are leased, the lessee would still need a DOGM-approved mine plan before mining could begin. Additionally, MSHA could also require necessary safety measures that could render a coal lease uneconomic. The BLM's primary role is to ensure that maximum economic recovery of the coal is achieved within the requirements of DOGM for protection of resources such as water, wildlife, etc., and within MSHA's safety requirements, and within current, available technology.

1.6.4 Other Planning Documents

Other than the BLM's relevant land use planning decisions in the PFO RMP, no other federal land use plans apply to the alternatives presented in Chapter 2. The State of Utah does not maintain planning documents, nor does it conduct planning processes relating to the alternatives. However, the alternatives would be consistent with the State of Utah Public Lands Policy and Coordination Office's position on 1) uses of public lands for multiple-use, sustained-yield natural resource extraction; 2) support of the specific plans, programs, processes, and policies of state agencies and local governments; and 3) development of the solid mineral resources of the state as an important part of the state economy and of local regions in the state (Utah Code 63-38d-401). The Proposed Action is also consistent with Emery County's *General Plan* in that it addresses the *General Plan*'s support for the development of extraction industries (Emery County 2016). Federal lease rentals and production royalty on the gross proceeds from coal developed in the proposed modification areas would be paid by the mining company to the U.S. Department of Interior, Office of Natural Resources Revenue (ONRR). ONRR then distributes 50% of the federal royalty revenue to the state where the mining occurs. The state shares this revenue with the county or counties in which the mining takes place. Additional overriding royalties on federal coal reserves are limited to 50% of the federal royalty.

1.6.5 John D. Dingell, Jr. Conservation, Management, and Recreation Act

The John D. Dingell, Jr. Conservation, Management, and Recreation Act (S.47) was signed by the President in March 2019 and became P.L. 116-9. Under this law, an area to the east of the proposed lease modification areas, but not adjacent to or overlapping the lease modification areas, was designated as the Turtle Canyon Wilderness Area (Figure 3-1). The Turtle Canyon Wilderness Area will be administered by the Secretary in accordance with the Wilderness Act

(16 USC 1131 et seq.) with exceptions as noted in P.L. 116-9. In addition, the lands that have been adequately studied for wilderness values but not designated as wilderness will be managed in accordance with applicable law and any applicable land management plan. In particular relation to this EA, the latter statement applies to those lands previously considered as part of the Turtle Canyon WSA, which are no longer part of a WSA under this law.

1.7 Identification of Issues

1.7.1 Internal Scoping

The BLM held an introductory interdisciplinary (ID) team meeting in June 2018. It was determined at that time that additional information would be needed to proceed with processing the application. The BLM ID team formulated potential issues associated with the Proposed Action (lease modifications and anticipated full extraction of coal resource) during internal scoping conducted from July through September and completed the ID team checklist (Appendix A) on October 30, 2018, which was updated periodically throughout the EA process.

1.7.2 External Scoping

The BLM listed the Proposed Action on its ePlanning website on May 14, 2018. No public inquiries were received regarding the Proposed Action. The BLM initiated tribal consultation in October 2018 to determine if leasing and mining the proposed lease modification areas would affect cultural resources or Native American religious concerns. A response letter dated October 18, 2018, was received from the Hopi Tribe requesting copies of any cultural resources reports or treatment plans should adverse effects be anticipated as a result of the development of the proposed lease modification areas. There were no other responses.

1.7.3 Issues

The following potential issues were identified during the scoping process:

Air quality and greenhouse gas emissions: How would leasing and mining of the LMA areas contribute to criteria pollutants, hazardous air pollutants (HAPs), and greenhouse gas (GHG) emissions?

Socioeconomics: How would leasing and mining of the LMA areas affect jobs, income, and tax revenues in Emery County, Utah?

Water resources: How would leasing and mining of the LMA areas affect groundwater resources and surface water resources in the analysis area (watershed)?

Geology, minerals, and energy production: How would leasing and mining of the LMA areas affect oil and gas leasing in the areas? How would this potential resource use conflict be managed?

Colorado River Endangered Fish: How would federally listed fish species in the Colorado River system be affected by dry deposition of HAPs due to continued operation of local coal-fired power plants?

CHAPTER 2. DESCRIPTION OF THE ALTERNATIVES

2.1 Introduction

This EA analyzes the potential effects of implementing Alternative A (No Action) and Alternative B (Proposed Action). The No Action Alternative is considered and analyzed to provide a baseline against which to compare the impacts of the Proposed Action. Based upon BLM's internal scoping, no other alternatives were brought forward for detailed analysis. Two alternatives suggested during the public comment period were considered but not carried forward for detailed analysis; they are described below.

If a decision is made to issue a modified lease, the lessee must obtain federal mine plan approval and amend its current DOGM permit to conduct coal mining operations, including a detailed MRP, before mining can begin in the modification areas. As discussed in Chapter 1, this MRP and overall PAP would undergo detailed review by state and federal agencies as part of the approval process. The detailed PAP would be required to conform to the stipulations and conditions attached to the lease modification consistent with the PFO RMP and to conform to the decision that would follow this EA. At a minimum, the lease modifications would contain the stipulations that are contained in the two parent leases. While there could be new stipulations specific to the lease modifications, the parent lease stipulations would apply to each associated lease modification. The parent lease stipulations and the stipulations specific to the lease modifications are provided in Appendix B.

The conceptual plans for development described in this EA are not final plans but represent reasonably foreseeable development for use in analyzing the potential environmental consequences of approving lease modifications for the two tracts based on current coal markets and current standard coal mining industry operating practices. Again, full extraction of the coal resource is anticipated if the Proposed Action is selected.

2.2 Alternatives Development

No alternatives other than the No Action and Proposed Action were developed with respect to the proposed lease modification because there are no unresolved conflicts concerning alternative uses of the available coal resource. Alternatives suggested during the public comment period included an alternative excluding one lease modification to limit the amount of expansion, and a methane reduction alternative to require methane emissions reduction strategies. The No Action and Proposed Action alternatives are described below.

2.3 Alternative A: No Action

Under the No Action Alternative, the BLM would not offer the modification areas for leasing at this time, and the federal coal reserves within the modification areas would not be mined at this time. The choice on the part of the BLM not to lease the modification areas would not preclude leasing and mining of the areas sometime in the future. However, to consider leasing and mining these modification areas in the future, another application would have to be submitted and another NEPA process would need to be completed.

2.4 Alternative B: Proposed Action

Under the Proposed Action, the BLM would offer the Lila Canyon modification areas for lease to UEI, subject to standard and special lease stipulations developed for the tracts (see Appendix B). In the case of federal coal lease modifications, the stipulations attached to the "Parent" lease, at a minimum, always are included as stipulations in the modified area. This does not in any way preclude new stipulations resulting from this action either by the BLM or (not in this case) the surface management agency other than the BLM. The boundaries of the proposed modification areas would be consistent with the location description in Section 2.4.1. The BLM estimates that there are approximately 7.2 million tons of salable coal in these two areas, which are projected to extend the life of the Lila Canyon Mine by approximately two to three years.

Under the Proposed Action, all coal would be mined using underground methods from the existing Lila Canyon Mine as described in Section 2.4.2. UEI would develop these coal reserves by adding, or extending, up to five longwall panels to its mining plan. The location of these reserves, immediately adjacent to the existing Lila Canyon Mine, makes it virtually impossible, physically, that any future mine in this part of the Book Cliffs Coal Field could attempt to access these coal reserves. Given the depth of cover (2,500 to 3,000 feet) and adverse geological conditions (faulting, etc.) in the proposed modification areas, the possibility of mining into these areas from *any* other direction would be too difficult. The only possible scenario, if BLM decides to offer the Williams Draw Lease by Application (LBA) at a competitive lease sale, would be if another mining company besides UEI were to acquire the Williams Draw Federal Coal LBA, start a new mine with all new surface facilities and portal access, and then ultimately access the proposed lease modification areas from the south rather than from the west (Lila Canyon Mine). Because that hypothetical action would also require all new NEPA and all new MRP/PAP analysis, the timing and cost of the activity would render it unfeasible.

2.4.1 Location and Overview

The two Lila Canyon proposed lease modification areas are located in the Book Cliffs coal field in Emery County, Utah, closest to the towns of East Carbon (aka Dragerton) and Sunnyside (see Figure 1-2). From the Lila Canyon Mine portal site, East Carbon, Utah, is roughly 10 miles north- northwest; Green River, Utah, is 32 miles south-southeast; and the Emery County seat of Castle Dale, Utah, is 40 miles west-southwest, across the Castle Valley. The Carbon County seat of Price, Utah, is 25 miles directly west-northwest. The closest coal-loading terminal (unit-train) is the Savage Brothers–owned Savage Coal Terminal (SCT) between Wellington and Price, Utah, on the mainline of the Union Pacific Railroad. The haulage distance to the SCT from the Lila Canyon Mine is approximately 32 miles, and it is another 12 miles to the Wildcat Unit-Train Loadout, located on the Utah Railway near Helper, Utah. For the most part, the Lila Canyon Mine coal is shipped through the SCT, where there is also a heavy media wash plant facility. The lease modification areas encompass 1,233.44 acres of BLM-administered land and 39.2 acres State of Utah-administered land. The total 1,272.64 acres overlay federal (BLM) mineral estate. The two delineated modification areas are contiguous to two of UEI's existing federal coal leases, are contiguous to each other (north to south), and are as described below.

If added to federal lease UTU-014218

- Township 16 South, Range 15 East, Salt Lake Base and Meridian, Utah
  - Section 7: lot 4
  - Section 18: lots 1–4, W1/2 NE1/4 NW1/4, W1/2SE1/2NW1/4, SE1/4SE1/4NW1/4, NE1/4SW1/4, N1/2SE1/4SW1/4
  - Section 19: lot 1

  Total area added to lease UTU-014218: 317.84 acres

If added to federal lease UTU-0126947

- Township 16 South, Range 15 East, Salt Lake Base and Meridian, Utah
  - Section 18: S1/2SE1/4SW1/4, SW1/4SW/4SE1/4
  - Section 19: lot 2, W1/2NW1/4NE1/4, SE1/4NW1/4NE1/4, SW1/4NE1/4, E1/2NW1/4, W1/2SE1/4, SE1/4SE1/4, W1/2NE1/4SE1/4, NE1/4SW1/4
  - Section 29: S1/2NW1/4, SW1/4, W1/2SW1/4SE1/4, SW1/4NW1/4SE1/4, SW1/4NW1/4NW1/4
  - Section 30: SE1/4, N1/2NE1/4, SE1/4NE1/4

  Total area added to lease UTU-0126947: 954.80 acres

In the Lila Canyon area, there are primarily two coal seams located in the Blackhawk Formation: the Upper Sunnyside and the Lower Sunnyside. The two seams have merged in some places within the Lila Canyon holdings but in most areas are separate. Where separate, only one split is mineable due to the thin separation between the two splits; the separation averages 0 to 30 feet. The Upper Sunnyside seam averages 12.4 feet thick according to estimates in the Lila Canyon Mine R2P2 and in the MRP. The Lower Sunnyside seam is much thinner (0 to 5.7 feet) (BLM 2000). Therefore, the Upper Sunnyside is the seam of interest on this property. The seam is considered to be moderately gassy (i.e., methane) and is excellent quality, at 8% ash, 0.8% sulfur, and in excess of 12,000 British thermal units per pound, as-mined.

If mining occurs as proposed, based on UEI's plans, it is expected that UEI would use existing surface facilities currently included in its DOGM-approved mine plan for the Lila Canyon Mine (C/007/0013), with no additional surface disturbance (see Figure 1-2).

2.4.2 Conceptual Mine Plan

If the modified leases are issued to UEI, the conceptual mine plan would use the same mine facilities and the same or similar mining methods, reclamation, water requirements, and other mining activities/requirements, as described in the mine plan for the existing Lila Canyon Mine. Surface-support facilities that would be used in conjunction with the proposed operations on the modification areas would consist of those for the most part already in place and in use for the Lila Canyon Mine area. No new surface facilities would be constructed.

The conceptual mining plans described for the lease modification areas are based on the Lila Canyon Mine plan and other common coal mining practices; these are not final plans but represent reasonably foreseeable development for use in analyzing the potential environmental consequences of modifying leases to develop the projected recoverable coal tonnage.

The BLM would require the Mine to employ measures that will minimize exposure of the public to air pollutants exhausting from mine portals/adits. Measures may include the use of fencing or

other physical barriers, natural barriers, signage, or other measures that preclude public access to the portals/adits. Persons who require legal or practical access to the air vents, such as Mine employees or business invites and guests of the Mine, are not considered members of the general public and would continue to have access to these areas.

2.4.2.1 Mining Methods and Mine Facilities

Existing surface-support facilities would provide the necessary infrastructure for personnel, equipment, materials and supplies, and handling and loading of coal production. These facilities are located primarily within a BLM right-of-way issued for this purpose and include structures specifically designed to minimize surface disturbances and/or to control or mitigate impacts to other non-coal resources, such as air, surface water, wildlife, and soils.

Surface facilities include the following (Note: some surface facilities are located at the nearby West Ridge Mine [West Ridge] facility [DOGM ACT 007/041]):

- Small administration office (main administration office at West Ridge)
- Bathhouse/lamphouse
- Mine fan
- Shop/warehouse (West Ridge)
- Coal stockpiling facilities
- Coal reclaiming facilities Electrical power/substation
- Water facilities
- Telephone service
- Water tank(s)
- Other structures (i.e., storage sheds, pump house, aboveground storage tanks, powder magazines, rock dust storage tanks, and trash containment structures) (Lila Canyon and West Ridge)

Initial mine development was completed in Lila Canyon in conjunction with prior approvals to access coal reserves and construct the Lila Canyon portals. Because of the stratigraphic location of the Upper Sunnyside coal seam where it meets the surface in Lila Canyon, the seam was accessed by 1,100-foot rock slopes. The main Lila Canyon entries are the primary “Man and Material” mine access and supply routes for the economically minable portions of the coal seam(s). The entries provide ventilation routes for all other underground workings and the principal coal haulage system (conveyer beltlines).

If the modification areas are leased, continuous miners (CM) would be used to support the longwall mining methods for coal extraction. Longwall mining is used where the coal seam is reasonably continuous in order to create large enough blocks to support longwall. Continuous miners first outline a large block of coal to be mined by longwall methods. Figure 2-1 shows a typical longwall mining scenario where CMs have already developed the longwall block with gate-roads on either side. These gates provide worker and material access, airways, and haulage-ways. The following primary equipment is required to support longwall mining operations:

- Longwall mining system (face conveyor, shearer, shields, etc.) (see Figure 2-1)
- Section power center
- Section coal conveyer

- High-pressure hydraulic pumps Crew vehicle
- Rock dust system (fire protection)
- Miscellaneous support equipment, such as diesel tractors, trailers, battery or diesel supply haulers, etc.

To construct the gate-roads, the CMs cut the coal, and the coal is hauled from the face by electric shuttle cars and dumped into the feeder-breaker, which crushes large blocks and ratio-feeds the coal to the conveyor belts. Following the CM's 10-to-20-foot cuts, roof bolters come into the area and provide roof support in a variety of ways, depending on specific conditions. Additional maintenance and support equipment and systems include personnel carriers, supply tractors and trailers, lubrication trailers, rock dust and electrical distribution systems, underground communication systems, water pumps, and mine ventilation.

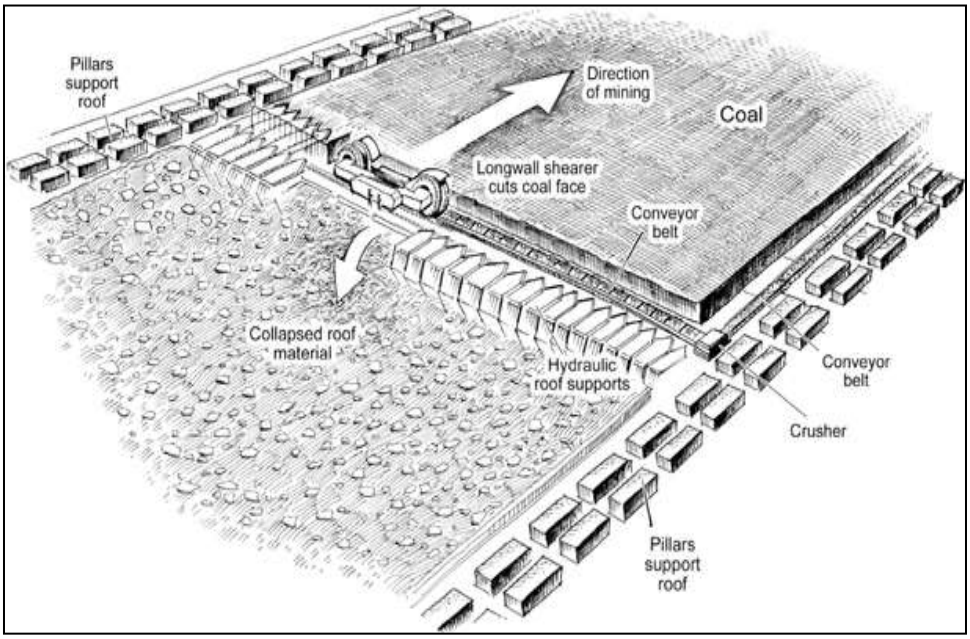


Figure 2-1. Typical longwall mining scenario.
Source: Securities and Exchange Commission (2011).

2.4.2.2 Mine Coal Haulage System

The current underground mining system at Lila Canyon Mine uses a conveyor belt system to transport coal from the underground workings to the surface. The mine coal haulage system consists of several interconnected belt components (feeder breakers, take-ups, drives) to transport coal to the surface. These conveyer belts transport the coal all the way outside to a stockpile. A multi-plate reclaim tunnel is located underneath the coal stockpile for processing and loading trucks.

Two reclaim draw-down ports located at the end of the tunnel allow coal to be reclaimed from the bottom of the pile directly onto a reclaim conveyor located within the tunnel. Each reclaim port contains a pile activator, a hydraulically operated single-bladed shut-off gate, and a discharge chute leading to the reclaim conveyor. Once the coal has been loaded onto the reclaim conveyor, it is transported out from underneath the pile. The reclaim conveyor brings the coal out of the tunnel and transports it to an enclosed crushing/screening building.

From the crusher building, the crushed and screened 2-inch coal is loaded onto a covered loadout conveyor and passed to one of three product piles or transport storage pile. The coal is then transported to an automated truck loadout station. The feed conveyors (i.e., loadout conveyor and reclaim conveyor) start and stop automatically to load the individual truck trailers with a predetermined amount of coal (BLM 2000).

2.4.2.3 Subsidence

No surface expression of subsidence is anticipated above the two proposed lease modifications. The proposed lease modifications cover an area that has very deep cover over the top of the coal seam to be mined. The Lower Sunnyside seam in this area is at least 2,000 feet deep and up to 3,000 feet deep. While there are differing thoughts on calculating maximum subsidence, the BLM uses a calculation that is conservative when compared with other estimates. It says that for every 1 foot in depth of coal mined, there is a possibility for 60 feet (depth) of overburden to shift downward in response. In other words, assuming that the coal seam is 18 feet thick, this would make an upward-caving feature of around 1,100 feet, far beneath the ground surface. This represents a worst-case scenario; although coal seam thickness may reach 18 feet in some areas, longwall equipment used at the Lila Canyon Mine will reach a maximum of 12 feet.

This “worst-case scenario” also assumes longwall panels are mined side-by-side and that the overburden is composed of relatively weak material. In fact, the longwall panels will be mined in a panel-barrier-panel configuration. This means that rather than having two or even three panels adjacent to each other, creating a mined-out area 3,000 feet wide, there would sequentially be a panel-barrier mining sequence - whereas the panel and barrier dimensions would depend upon MSHA requirements. In addition, the overburden at the Lila Canyon Mine contains three massive, very rigid sandstone members totaling approximately 400 feet in thickness.

Three professional mining engineers, from BLM and outside consulting firms, have conducted surveys of the ground cover above the Lila Canyon Mine, as well as above the nearby West Ridge Mine, which had very similar conditions and overburden features. Subsidence was not visible on the surface. The conclusion made from these factors is that surface expression of subsidence should not be evident or measurable.

UEI conducted a color infrared aerial photography study as part of its monitoring commitments under the Lila Canyon Mine DOGM permit approval. The study was conducted to monitor impacts of subsidence on surface vegetation communities. The baseline data was gathered in 2011, and the study was repeated in 2016 per the 5-year interval requirement. No differences were observed between years, suggesting that if subsidence occurred, it has had little impact to the plant and soil communities at the Lila Canyon Mine (UEI 2019a).

2.4.2.4 Post-Mine Reclamation

Under the existing Lila Canyon Mine plan, DOGM would approve, and monitor reclamation of surface facilities and reclamation bond release at the end of the mine life, after the economically recoverable coal reserves have been mined. UEI has posted a bond with DOGM to secure reclamation costs for existing surface facilities at the Lila Canyon Mine. Complete reclamation would include removing all surface facilities, re-grading the surface to achieve approximate original contour, and restoring the area to the approved pre-mining land use. Revegetation would be done with an approved mixture of compatible grasses, forbs, shrubs, and trees. Seed mixes

would contain an approved, diverse mixture of species to control erosion and to provide forage for wildlife species. No surface disturbance is planned in the lease modification areas and, thus, no surface reclamation would be required.[1]

2.4.2.5 Water Requirements

- Water usage, based on 1 million tons of coal per year production, would be:
  - Bath house/office (culinary water): 1,260,000 gallons per year
  - Mining: 4,500,000 gallons per year
  - Fan evaporation: 1,183,000 gallons per year

  Total: 6,943,000 gallons per year (BLM 2000)

As coal production increases to 2 million tons per year (TPY), the water used would increase to approximately 11,443,885 gallons per year. Water usage would increase to approximately 15,943,887 gallons per year at 3 million tons of coal annually before peaking at approximately 20,443,888 gallons per year at 4 million tons of coal at full production. Water use requirements are not a linear function of production; culinary use remains fairly constant even if production dips or increases. Potable water is purchased offsite and hauled to the bath house facilities while underground mine water is generally adequate to be used and recycled for underground dust control and fire suppression. (MSHA requirements). UEI has a State of Utah Department of Environmental Quality discharge permit (Utah Pollutant Discharge Elimination System [UPDES] General Permit for Coal Mine Operations) should the mine produce more water from the underground mining process than can be used for the MSHA requirements.

2.4.2.6 Electrical Power Supply

Electrical power for the Lila Canyon proposed lease modification areas development and mining activities would come from an existing 46-kilovolt (kV) overhead power line that terminates at a substation at the existing Lila Canyon Mine. Power would be taken underground, working at 12.5 kV, where section transformers convert the power to equipment-friendly 1,000, 440 and 220 volts.

2.4.2.7 Underground Development Rock

Mine development, ongoing mining production operations, and ancillary operations such as development of overcasts for mine ventilation and coal haulage would result in the production of underground development rock, including carbonaceous shale, weathered coal, floor clay, some sandstone, and parting materials. Where it is operationally feasible to separate these materials from the coal during development and mining, the underground development rock would be removed and handled separately from the coal and placed underground in permanent storage. Where separation is not feasible, underground development rock would be handled with the coal, removed in the surface facilities, separated from the coal product (becoming coal processing waste), and temporarily stockpiled. Stockpiled underground development rock could be sold as a low-quality coal product or deposited in approved facilities, as permitted by DOGM. Most commonly at Lila Canyon and other mines, waste rock is simply placed permanently in underground storage.

[1] DOGM does not simply observe reclamation and move on. The company's reclamation bond cannot be released without achieving reclamation success, and it is then only released in phases for certain accomplishments. For instance, after achieving approximate original contour, Phase I can be released. For achieving good sediment control, Phase II can be released, but the final release (Phase III) will not occur until a minimum of 10 years has passed to ensure successful revegetation.

Generally, the same mining equipment and haulage systems used for coal production would be used to remove and handle underground development rock. However, specialized rock mining and handling equipment could be used.

2.4.2.8 Hazardous Materials and Hazardous and Solid Waste

Potentially hazardous materials used or produced under the current Lila Canyon Mine plan may include fuels (e.g., gasoline and diesel fuel), coolants/antifreezes, lubricants (e.g., grease and motor oil), paints, solvents, resin cartridges, shop rags, lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. These are all identified as solid wastes under the Resource Conservation and Recovery Act (RCRA)(42 USC 6901 et seq.). No RCRA chemicals or wastes in excess of regulated amounts would be stored on-site. All wastes would be disposed of in a proper manner as prescribed by law. It should also be noted that under U.S. Environmental Protection Agency (EPA) regulations (40 CFR 372), all coal mining companies are required to maintain a toxic release inventory and produce the documentation of "No Spills" or "Minor Spills" with volume and threshold information for each spill, when requested by EPA.

Most maintenance and major oil changes for the diesel mobile equipment (if any) would take place inside the surface shops. Used oil would be contained and disposed of or recycled in accordance with guidelines administered by the Utah Department of Environmental Quality's Division of Solid and Hazardous Waste. All fuel storage facilities and equipment would be constructed and operated in accordance with all applicable state and federal regulations, including a toxic release inventory.

All solid and liquid wastes would be contained, stored, and disposed of in accordance with applicable local, state, and federal rules and regulations. Specific containment, storage, and disposal techniques would depend on the type and quantity of waste according to applicable rules and regulations. Typically, non-hazardous solid and liquid waste would be contained on-site in dumpsters and transported periodically to a landfill. Some used equipment could be left in place underground after oils and hazardous materials have been removed and only when approval is received from DOGM and BLM.

Any hazardous solid or liquid wastes would typically be separated and stored in appropriately labeled (according to type of waste) barrels that meet the requirements in the RCRA. Barrels would typically be stored temporarily under cover before being hauled to a hazardous waste disposal facility. A spill prevention plan and other plans are currently in place at the Lila Canyon Mine.

In 2015, the Mine constructed a package plant for treatment of biosolids and constructed a new bath house. The Mine obtained a UPDES Minor Industrial Permit (No. UT0026018) for collection and treatment of wastes transported through a sewer system. Discharge of the treated wastewater is from the package plant to a drainage ditch to Lila Canyon Wash.

2.4.2.9 Normal Operating Hours

As with the current production, it is anticipated that production from the Lila Canyon proposed lease modification areas could occur 24 hours per day, 7 days per week. Most commonly, however, production takes place 16 hours per day and maintenance the other 8 hours per day. In order to maintain cost effective operations, overtime is kept to a minimum.

2.4.2.10 Signage

Required signs and markers in compliance with the applicable regulatory provisions of Utah Administrative Code R645-301-521.200 and MSHA are in place at the existing Lila Canyon Mine. All required signs and markers would be maintained or replaced during the period of active operations, site reclamation, and until final bond release is approved for all areas within the permit boundaries.

2.4.2.11 Estimated Employment Requirements

Leasing the Lila Canyon proposed modification tracts would extend the life of the Mine, but neither the workforce of approximately 238 nor the annual production, which "shall not exceed 4.5 million tons per rolling 12-month period" (DAQ 2013), would be expected to increase.

2.4.2.12 Traffic Estimates

Coal from the proposed modification areas would be transported using existing haul roads to reach U.S. Highway 191/6, and then transported to an existing loadout site on Ridge Road near Wellington, Utah. At a coal production level of 4.5 million TPY, haul trucks (at full capacity of 46 tons) at the Lila Canyon Mine would make approximately 268 round trips per day from the mine to the loadout. The distance between the Mine and the loadout is approximately 32 miles (64 miles round trip). There are also approximately 88 round trips per day made by personal and delivery vehicles to the Lila Canyon Mine (BLM 2000).

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter presents the existing environment and the environmental consequences on resources that could be affected by the Proposed Action or No Action alternatives. Environmental data collected on the proposed lease modifications were used to describe the affected environment and to evaluate potential environmental impacts. The analysis is intended to allow comparison of alternatives and to provide a method to determine whether activities proposed would be expected to comply with applicable federal, state, and local regulations.

The analysis of impacts is based on the scope of the proposal, which includes about two to three years of underground mining for a total of 7.2 million tons of coal (in the lease modification areas) and aboveground processing and shipping operations at a currently operating facility. No additional surface disturbance would be required to conduct activities and recover the coal.

The impacts from construction of facilities, utilities, transportation routes, and mining and hauling operations at the Lila Canyon Mine are described in the Lila Canyon Project EA (BLM 2000). The air quality assessment and cumulative emissions assessment for the PFO are summarized in the *Utah Bureau of Land Management Air Resource Management Strategy 2020 Monitoring Report* (BLM 2020b).

3.1.1 Setting

The lease modification areas are east of and adjacent to currently developed federal coal leases at the Lila Canyon Mine in Emery County, Utah, located in the Book Cliffs region of the Colorado Plateau Physiographic Province of east-central Utah. This area is approximately 120 miles southeast of Salt Lake City, Utah, and approximately 10 miles south of East Carbon, Utah.

Elevations in the lease modification areas range from approximately 8,113 feet above mean sea level (amsl) near the northern portion of lease modification area U-014218 to 6,800 feet amsl at the southern boundary of lease modification area U-0126947 (see Figure 1-2). Characteristic vegetation includes Douglas fir (*Pseudotsuga menziesii*) at the highest elevations, pinyon-juniper forests over most of the bench areas, and a mixture of shrubs and grasses in the low areas (BLM 2000).

Climate data from the Sunnyside, Utah, National Oceanic and Atmospheric (NOAA) weather station (428474) is provided in the Lila Canyon Mine MRP as being generally representative of conditions at the Lila Canyon Mine (Cirrus and Petersen 2017). The average annual mean monthly temperature at Sunnyside, Utah, is 47.55 degrees Fahrenheit (°F), with an annual high temperature of 59.6 °F and an annual low temperature of 35.5°F (U.S. Climate Data 2019).

3.1.2 Past, Present, and Reasonably Foreseeable Future Actions

Past and present actions near the LMA areas are mainly underground mining and underground mining–related operations, which include coal combustion at local coal-fired power plants (Appendix C). Energy sector production between 2015 and 2019 in Utah, the region, and the nation is described in Appendix D. Past and present actions may influence the environmental setting for analysis of site-specific effects of the Proposed Action. Reasonably foreseeable future actions are actively proposed events that may affect the same resource(s) during the timeline of the Proposed Action.

3.1.2.1 Past and Present Actions

Table C-1 (Appendix C) lists the past and present actions in the resource-specific analysis areas that are considered in the analysis of cumulative effects. Appendix D describes state, regional, and national energy sector production and emissions trends.

3.1.2.2 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions in the resource analysis areas defined in this chapter are identified below and listed in Table C-2 (Appendix C). None of the past, present, or reasonably foreseeable future actions described in this section are considered connected actions to the Proposed Action analyzed in this EA (see Appendix C). Reasonably foreseeable future actions in the vicinity of the lease modification areas are identified below. Energy sector production trends for the region and nation are described in Appendix D. No new coal-fired power plants are proposed or anticipated for Utah or the region. Most of Utah's electric generating capacity added since 2016 is powered by solar energy (EIA 2020).

SITLA Coal Lease: UEI was granted a lease in October 2018 by the State of Utah through SITLA for the exclusive right to explore for, drill for, mine, remove, transport, convey, cross-haul, commingle, and sell the coal contained within the boundaries of T. 16 S., R. 14 E., sec. 36 and T. 16 S., R. 15 E., sec. 32 (see Figure 1-2) in Emery County. The SITLA lease has an initial 10-year term. It is reasonably foreseeable that UEI will include the extraction of the coal in these sections in future plans.

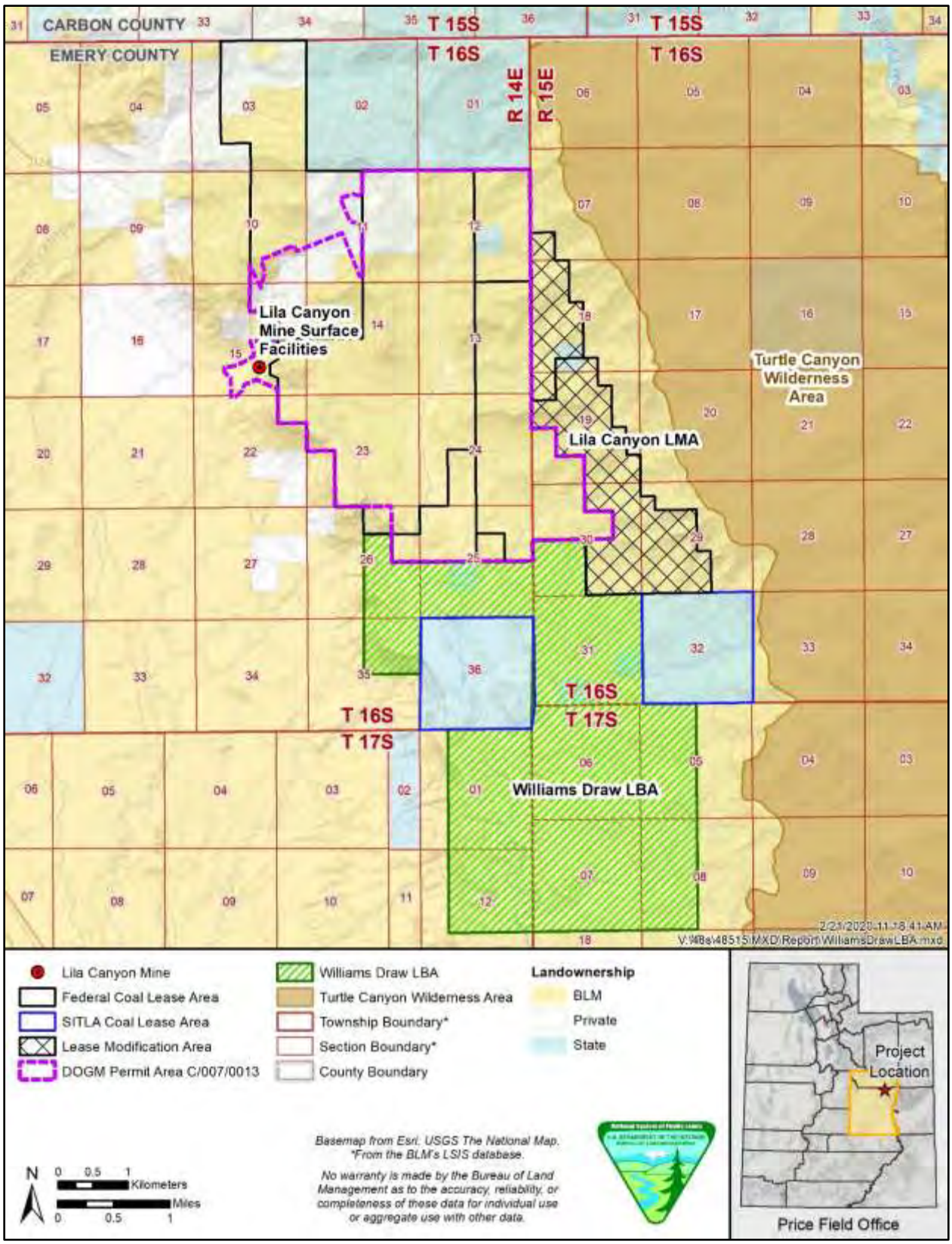


Figure 3-1. Nearby wilderness and proposed LBA.

Williams Draw LBA: UEI submitted a coal LBA for approximately 4,232 acres in the Williams Draw area, south of current UEI reserves (see Figure 3-1). The LBA delineation and recoverable reserves have been determined by the BLM. The BLM is currently assessing whether to lease the LBA coal. If the BLM decides to offer the Williams Draw LBA at a competitive lease sale, and if the LBA is leased by UEI, then mining in the leased area may occur while the Lila Canyon Mine reserves are being mined or after the Lila Canyon Mine reserves are exhausted. Under P.L 116-9, the BLM will no longer manage the land surface, or the coal described in the Williams Draw LBA; both will be controlled by SITLA. It should be noted that depending on the timing of exchange parcels between BLM and SITLA, that BLM may decide to conduct a competitive sale and issue the Williams Draw lease to the successful bidder prior to it being turned over to SITLA. In any case, the mining of the resource is the subject here.

Walker Flat LBA: Bronco submitted a coal LBA in March 2018 for 2,956 acres in the Walker Flat area of Emery County, Utah, located approximately 62 miles or 100 kilometers (km) southwest of the Lila Canyon Mine. In August of 2020, Bronco modified the application to reduce the LBA acreage from 2,956 to 1,042. If this area is leased and developed, then mining in the Walker Flat area may occur while the Lila Canyon Mine and Williams Draw LBA (if offered and leased) are being mined. The BLM is preparing a draft EA to describe the potential environmental impacts of leasing the Walker Flat coal tract. Mining the Walker Flat LBA would extend the life of the Bronco Utah Mine, which produced approximately 694,000 tons of coal in calendar year 2019. Depending upon demand and regulatory agencies' ability to process its request, Bronco could begin mining on Walker Flat within the next 3 years. The Bronco Utah Mine is permitted to produce up to 2 million tons of coal per year (rolling 12-month period); additional permitting would be required to increase production above this amount.

Little Eccles Coal LBA and LMA: Canyon Fuel Company, LLC provided applications to the BLM Utah State Office to modify coal lease UTU-77114 in Sanpete County and to lease the Little Eccles Tract in Emery County located near the Skyline Mine. Surface ownership is managed by the U.S. Forest Service. The BLM, U.S. Forest Service, and OSMRE will prepare an EIS to inform decision-making for these applications.

Uinta Basin Railway: The Utah Surface Transportation Board is currently analyzing a request filed by the Seven County Infrastructure Coalition for authority to construct and operate an approximately 85-mile common-carrier rail line connecting two termini in the Uinta Basin near South Myton Bench, Utah, and Leland Bench, Utah, to the national rail network via an existing rail line owned by Union Pacific Railway Company near Kyune, Utah. The proposed rail line would be used to transport crude oil, fracturing sand, machinery, and mineral and agricultural products and commodities. Three alternative routes are being considered in an EIS. All of these routes dip into northern Carbon County, Utah, for an approximate 5-mile stretch north of Helper. The BLM is participating as a cooperating agency in the EIS process. The three build alternatives may cross BLM-administered lands, and if so, a rail right-of-way would be needed.

BLM Quarterly Oil and Gas Lease Sales: Leasing of public lands for oil and gas exploration and production is required by the Mineral Leasing Act of 1920, as amended, and the BLM's current policy is to apply the least restrictive management constraints to the principal uses of the public lands necessary to achieve resource goals and objectives. Parcels to be offered would be leased subject to stipulations prescribed by the RMP. Before any surface-disturbing operations may be authorized, an additional site-specific analysis would be completed through the NEPA process. Further mitigation (if warranted and consistent with standard lease terms, notices, and

stipulations) to reduce impacts to the environment and other uses of the public lands could be required through the application for permit to drill (APD) or right-of-way processes.

December 2017 Competitive Oil and Gas Lease Sale: The BLM offered 74 parcels, totaling approximately 94,000 acres in Duchesne, Uintah, and Emery Counties, at its December quarterly oil and gas lease sale. The impacts of offering 15 of the 74 parcels were analyzed in the EA prepared by the PFO. The BLM held the lease sale online at www.energynet.com on December 12, 2017. None of the 15 parcels offered in the PFO received bids at the competitive sale. Three parcels were sold non-competitively after that sale.

3.2 Air Quality and Greenhouse Gas Emissions

In accordance with CEQ regulation 40 CFR 1502.21, the air quality analysis in this EA incorporates by reference the air technical report (SWCA 2019). This document is incorporated by reference because the Williams Draw LBA is located adjacent to the Lila Canyon Mine (to the south) and, like the proposed lease modification areas, would most likely use the existing Lila Canyon Mine surface facilities and coal movement operations if offered for lease and if UEI is the successful bidder for the Williams Draw LBA. Production from the Williams Draw LBA is anticipated to be 3.0 to 3.5 million tons per year, extending the life of Lila Canyon Mine by approximately 10 to 15 years. There is an estimated 32 million tons of recoverable coal in the Williams Draw tract, with another 4 to 5 million tons on a SITLA coal lease (SWCA 2019). The air technical report includes an emission inventory for the pending Williams Draw LBA, which is generally based on production limits established in the DAQ approval order for Lila Canyon Mine. The Lila Canyon Mine production limit is 4.5 million tons per year (unless the DAQ approves an increase in production), whether that coal is mined from existing leases, lease modifications, or newly-approved leases (such as an LBA). The impact analysis modeling was based on the DAQ approval order limit of 4.5 million TPY, which is higher than what is anticipated under the Proposed Action. The air technical report also includes a near-field modeling analysis.

Because the same facility production limits would remain in effect for the processing of coal from the proposed lease modification areas, the Williams Draw emissions and modeling data can be used as a proxy analysis for the proposed LMAs.

The analysis area for air quality comprises the 50-km near-field modeling analysis area delineated in the *Williams Draw Coal NEPA Analysis: Air Technical Report* (air technical report) (SWCA 2019). This analysis area was selected because the Williams Draw coal tract is located adjacent to the Lila Canyon Mine (to the south) and its impacts would be similar to those from development of the proposed lease modification areas. Because GHGs circulate freely throughout the atmosphere and continue to build up over time, the cumulative analysis for GHGs and climate change includes regional (Utah, Wyoming, New Mexico, and Colorado) and national data.

3.2.1 Affected Environment

3.2.1.1 Regulatory Requirements

Mining operations, coal transportation, and other elements of the Proposed Action would emit air pollutants regulated under the Clean Air Act (CAA). CAA provisions that are relevant to the Proposed Action include the NAAQS, the Prevention of Significant Deterioration (PSD), Class I and Class II areas, Air Quality-Related Values, General Conformity, and New Source Performance Standards (NSPS), Non-Road Engine Tier Standards, and National Emission Standards for Hazardous Air Pollutants (NESHAPs).

National Ambient Air Quality Standards

The EPA has established NAAQS to limit the amount of air pollutant emissions considered harmful to public health and the environment. Primary and secondary standards have been set for six criteria pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO_2),[2] ozone,[3] sulfur dioxide (SO_2), and particulate matter (PM). The NAAQS are summarized in Table 3-1.

Any state can promulgate ambient air quality standards that are more stringent than those of the national program; however, air quality standards cannot be less stringent. Utah has adopted the federal primary and secondary NAAQS and has not established any state level standards.

The EPA assigns classifications to geographic areas based on monitored NAAQS concentrations. If the air quality in a geographic area meets or is cleaner than the primary and secondary NAAQS for a criteria pollutant, it is called an attainment area (designated unclassifiable / attainment) for that pollutant. If the air quality in a geographic area does not meet the primary and secondary NAAQS for a criteria pollutant, it is called a nonattainment area for that pollutant. A particular geographic region may be designated an attainment area for some pollutants and a nonattainment area for other pollutants. Maintenance areas are previously designated areas for one of the NAAQS that have since met the NAAQS standards. *Unclassifiable* typically refers to an area where there is no monitoring data to verify its attainment status, so the EPA assumes it is in attainment. These are typically rural areas where air quality is generally not an issue. Emery County is in unclassifiable/attainment for all criteria pollutants (SWCA 2019).

Table 3-1. National Ambient Air Quality Standards

Pollutant		Primary or Secondary	Form	Averaging Time	NAAQS
CO		Primary	Not to be exceeded more than once per year	8 hours	9 parts per million (ppm)
				1 hour	35 ppm
Lead		Primary and secondary	Not to be exceeded	Rolling 3-month average	0.15 micrograms per cubic meter (µg/m^3)
NO_2		Primary	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years	1 hour	100 parts per billion (ppb)
		Primary and secondary	Annual mean	1 year	53 ppb
Ozone		Primary and secondary	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	8 hours	0.070 ppm
Particulate matter	$PM_{2.5}$*	Primary	Annual mean, averaged over 3 years	1 year	12.0 µg/m^3
		Secondary	Annual mean, averaged over 3 years	1 year	15.0 µg/m^3
		Primary and secondary	98th percentile, averaged over 3 years	24 hours	35 µg/m^3
	PM_{10}*	Primary and secondary	Not to be exceeded more than once per year on average over 3 years	24 hours	150 µg/m^3
SO_2		Primary	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	1 hour	75 ppb
		Secondary	Not to be exceeded more than once per year	3 hours	0.5 ppm

Source: EPA (2016a).

* PM_{10} is PM that is 10 micrometers in diameter or less; $PM_{2.5}$ is PM that is 2.5 micrometers in diameter or less.

[2] EPA uses NO_2 as the indicator for the larger group of oxides of nitrogen or NO_x. However, emissions are usually reported as NO_x.

[3] Ozone is not directly emitted into the air but is created by chemical reactions between NO_x and volatile organic compounds in the presence of sunlight.

Other Regulations

Prevention of Significant Deterioration

The PSD is a permitting program for new major sources or major modifications of existing sources of air pollution located in attainment areas. The program applies to new (or modified) major stationary sources in attainment areas; major sources are defined as those sources that emit 100 tons per year or more of any criteria pollutant for specifically listed source categories or that emit 250 tons per year of any criteria pollutant and are not in a specifically listed source category. The Proposed Action would not be in a listed source category and does not qualify as a major PSD source based on the emission inventory in Section 3.2.3.1.

Class I and Class II Areas

Under PSD regulations, the EPA classifies airsheds as Class I, Class II, or Class III. Class I areas are those areas where the most stringent standards for changes to air quality are in effect. These are areas of special national or regional natural, scenic, recreational, or historic value, for which PSD regulations provide special protection. Moderate pollution increases are allowed in Class II areas. In Class III areas, substantial industrial or other growth is allowed, and increases in concentrations up to the NAAQS are considered insignificant. No Class III areas have been designated to date; therefore, all areas not designated as Class I areas are known as Class II areas. If a source is subject to the PSD permitting program, it must perform air quality monitoring and modeling analyses, in addition to installing best-available control technology, performing an additional impacts analysis, and public involvement. A proposed source can demonstrate that it does not cause or contribute to a violation by demonstrating that the ambient air quality impacts resulting from the emissions would be less than the significant impact levels.

In conducting an air quality modeling analysis, PSD increment consumption must also be evaluated for a major source. A PSD increment is the maximum allowable increase in ambient concentrations allowed to occur above a designated baseline concentration; in contrast, the NAAQS establishes maximum total ambient concentrations for air pollutants. Significant deterioration is said to occur when the amount of new pollution would exceed the applicable PSD increment. PSD increments have been established for Class I, II, and III areas.

Based on the modeling protocol, the nearest Class I area to the proposed lease modification areas is Arches National Park, which is approximately 53 miles to the southeast (Figure 3-2). Other nearby Class I areas are Canyonlands National Park (approximately 68 miles south-southeast) and Capitol Reef National Park (approximately 77 miles southwest). Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry, a Class II area of interest, is located approximately 19 miles west-southwest of the proposed lease modification areas. Two wilderness areas are also located near the proposed lease modification areas: Turtle Canyon Wilderness (approximately 1.5 miles to the east) and Desolation Canyon Wilderness (approximately 5.2 miles to the east). The Turtle Canyon and Desolation Canyon Wilderness areas are Class II areas under the PSD program.

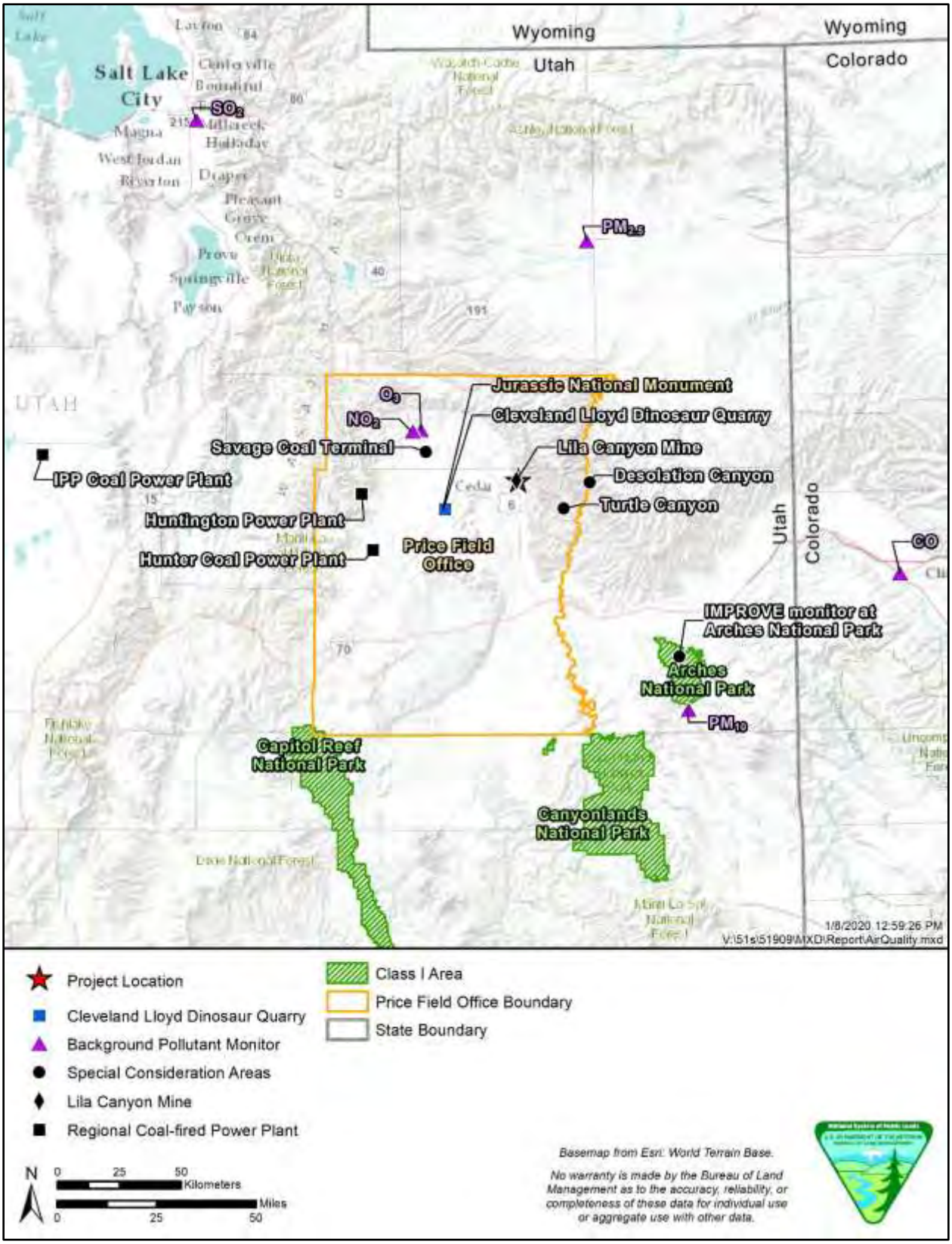


Figure 3-2. Air quality resources.

Air Quality–Related Values

An air quality–related value (AQRV) is defined as a resource "for one or more Federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by a federal land manager for a particular area" (U.S. Forest Service et al. 2010). The requirement to assess impacts to AQRVs is established in the PSD rules. The federal land manager for each Class I area has the responsibility to define and protect the AQRVs at such areas and to consider whether new emissions from proposed major facilities (or modifications to major facilities) would have an adverse impact on those values. For example, increased nitrogen or sulfur deposition from new or modified facilities could have a negative impact on AQRVs sensitive to such deposition, including lakes, streams, soils, vegetation, and wildlife.

General Conformity

The General Conformity Rule, established under 40 CFR 51(w) and 40 CFR 93(b), mandates a general conformity analysis for projects that require federal action. It applies to emission units or emission-generating activities resulting from a project that are not already covered by permitting and that are located in a nonattainment area. This regulation ensures that federal actions conform to the State Implementation Plan and state attainment plans. Because Emery County is an unclassifiable/attainment area, the General Conformity Rule does not apply to the LMA areas.

New Source Performance Standards

The EPA has also promulgated technology-based standards for specific sources of air pollution, known as the New Source Performance Standards (NSPS) (40 CFR 60). NSPS Subpart Y, Standards of Performance for Coal Preparation and Processing Plants, applies to the Lila Canyon Mine and affects coal production emission sources. NSPS regulations also apply to the SCT (Subparts A, Dc, and Y). NSPS regulations also require new engines of various horsepower classes to meet increasingly stringent nitrogen oxides (NO_X) and volatile organic compound (VOC) emission standards over the phase-in period of the regulations. In the air technical report emission inventory, NSPS are assumed to apply to all stationary engines (SWCA 2019).

Non-Road Engine Tier Standards

The EPA also sets emissions standards for non-road diesel engines for hydrocarbons (i.e., VOC), NO_X, CO, and PM. The emissions standards are implemented in tiers by year, with different standards and start years for various engine power ratings. The new standards do not apply to existing non-road equipment. Only equipment manufactured after the start date for an engine category (1999–2006, depending on the category) is affected by the rule. Over the life of the reasonably foreseeable development activities, the fleet of non-road equipment is expected to turn over, and higher-emitting engines will be replaced with lower-emitting engines. Non-road fleet turnover is not accounted for in the air technical report emission inventory; therefore, the emissions represent a conservative estimate for this source category.

The EPA engine tier standards do not apply to the underground mining equipment. In accordance with 40 CFR 1039.5(c), engines used in underground mining or in underground mining equipment are regulated by the MSHA in 30 CFR. Specifically, the MSHA standards at 30 CFR 72.500–72.502 establishes exhaust diesel PM emissions for permissible and non-permissible diesel-powered equipment, and 30 CFR 57.5060 establishes limits on miner exposure to diesel particulate matter. In addition to Diesel Particulate Matter standards, the concentration of NO_2 in underground mining environments may not exceed a ceiling value of 5 parts per million (ppm) as

established in MSHA standards at 30 CFR 75.322. Furthermore, 30 CFR 70.100 establishes concentration limits for respirable coal mine dust to 1.5 mg/m^3 at underground coal mines. MSHA requires a mine to take corrective action at lower concentration levels, so it is unlikely that these thresholds will be reached.

National Emission Standards for Hazardous Air Pollutants

Section 112 of the CAA requires the EPA to promulgate regulations establishing emission standards for each category or subcategory of major sources and area sources of hazardous air pollutants (HAPs); these are known as the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). HAPs (e.g., benzene, perchloroethylene, mercury) are known or suspected to cause cancer or other serious health effects. There are no NESHAP regulations that are applicable specifically to coal mining. Therefore, NESHAPs and maximum achievable control technology regulations do not apply to the Lila Canyon Mine or SCT.

3.2.1.2 State Permitting

Lila Canyon Mine

Stationary pollutant sources at the existing Lila Canyon Mine are regulated by the DAQ and are subject to Utah Administrative Code R307-401-8, which requires an approval order prior to constructing, installing, establishing, operating, or modifying air pollution-producing sources. The existing Lila Canyon Mine operates under Utah approval order number DAQE-AN121850003-13, dated May 10, 2013. The approval order establishes a production limitation of 4.5 million tons of coal per rolling 12-month period. This production limitation applies to the Mine and thus limits coal produced by the Mine in total from its existing, modified, or new leases, should any be obtained. Approved equipment at the Lila Canyon Mine consists of the underground coal mine, an enclosed crusher, a screen, truck loading facility, stacking tube associated with the coal stockpile, underpile reclaim system, rock dust silo, conveyors and mobile equipment, and diesel and gasoline storage tanks. The approval order establishes opacity limitations for particular emission sources such as conveyor transfer points. Opacity monitoring conducted in October 2018 observed no emissions from any of the emission sources (Barr Engineering Co. 2018). Water sprays or chemical dust suppression sprays are required at the enclosed crusher exhaust, at all conveyor transfer points, on unpaved roads and operational areas, and on storage piles to minimize fugitive dust generation.

Savage Coal Terminal

Stationary sources at the existing SCT are authorized by Utah approval order number DAQE-AN117930009-17 (last revised on June 21, 2017). The approval order establishes the following production limits: 9,500,000 tons of coal per rolling 12-month period and 1,000,000 tons of coal screened per rolling 12-month period.

Approved equipment at the SCT consists of coal truck unloading facilities, stacking tubes with associated coal stockpiles, covered radial stackers, a material processing crusher, underpile reclaim systems, an underground reclaim, a wash plant, material handling conveyors, a silo, diesel fuel tanks, antifreeze storage tanks, a fuel dispensing station, oil transloading racks, condensate collectors, vapor capture systems, a natural gas-fired boiler, a diesel generator, and on-site haul roads. The approval order establishes opacity limitations for particular emission sources such as crushers and screens. Water sprays or chemical dust suppression sprays are required at all crushers and screens, on repeatedly disturbed areas, on unpaved roads and operational areas, and on storage piles to minimize fugitive dust generation. The approval order

also requires enclosure of each conveyor transfer or drop point, all aboveground conveyors, the reclaim conveyor from the primary coal stockpile to the stacking tube, and the wash plant screens, crushers, and conveyors.

3.2.1.3 Existing Conditions

Climate

The climate in the vicinity of the proposed lease modification areas is discussed in detail in the air technical report and summarized briefly here. Generally, the climate is arid and influenced by both the Sierra Nevada and the Wasatch Mountains. Summers tend to be hot and dry, and winters are usually cold. Temperatures depend on elevation and latitude and can range from an average low of 15°F in January to an average high of 90°F in July (SWCA 2019). Wide ranges in temperature may occur over 24 hours as heat quickly builds during the day and rapidly dissipates at night. The average wind speed in the Lila Canyon Mine area is 7 miles per hour (mph) and it usually comes from the north-northeast. The area has an average annual precipitation of 10 inches, with August and September being the wettest months by average precipitation (SWCA 2019).

Background Air Quality

Background air quality in the Lila Canyon Mine area is provided in the air technical report and summarized briefly here. Background levels of criteria pollutants are provided in Table 3-2. The monitored concentrations in Table 3-2 are generally the averages of three years of data from pollutant monitors closest to the proposed lease modification areas. Monitors and averaging periods were selected by their relative distance to these areas and by recommendation of the DAQ.

Table 3-2. Background Levels of Criteria Pollutants

Pollutant	Monitoring Station ID	City, State	Approximate Distance from Proposed Project (miles)	Averaging Period	Monitored Concentration		
					(ppm)	(ppb)	(µg/m^3)
CO*	08-077-0018	Grand Junction, Colorado	101	1-hour	1.50	–	–
				8-hour	1.30	–	–
NO_2†	49-007-1003	Price, Utah	27	1-hour	–	18.00**	–
				Annual	–	6.40††	–
Ozone‡	49-007-1003	Price, Utah	27	8-hour	0.067	–	–
$PM_{2.5}$§	49-013-0002	Roosevelt, Utah	65	24-hour	–	–	24.00
				Annual	–	–	6.10
PM_{10}¶	49-019-0006	Moab, Utah	73	24-hour	–	–	42.00
SO_2#	49-035-3006	Salt Lake City, Utah	121	1-hour	–	7.00	–
				3-hour	–	6.33	–

Source: SWCA (2019).

ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per liter

*Data from Grand Junction-Pitkin monitor for the years 2015–2017.

†Data from monitor on private property for the years 2012–2014.

‡Data from monitor on private property for the years 2015–2017.

§Data from Roosevelt monitor for the years 2015–2017.

¶Data from Moab monitor for the years 2000–2003.

#Data from Hawthorne monitor for the years 2015–2017.

**Design value from AQS, H8H, for the years 2015–2017.

††Two-year average of annual mean; 2015 did not have complete data.

Emission inventories provide a summary of the type and amounts of pollutants emitted on an annual basis from a particular source. Total emissions from the most recent emission inventories for Emery County and Carbon County are summarized in Table 3-3. While the Lila Canyon Mine is in Emery County, it is near the border and close to emission sources in Carbon County. The Hunter and Huntington Power Plants are major emissions sources operating in northwestern Emery County and thus their emissions are included in the emission inventory. There are no major emissions sources within the 50-km (31-mile) near-field study area. The Hunter Power Plant, approximately 37 miles (60 km) west-southwest of the LMA areas, is a Phase II Acid Rain source and is a major source for SO_2, NOx, PM_{10}, CO, VOC, HAP, hydrochloric acid (HCl), and GHG. The Huntington Power Plant, approximately 36.5 miles (59 km) west of the LMA areas, is a Phase II Acid Rain source and is a major source of SO_2, NOx, PM_{10}, CO, HAP, hydrofluoric acid, and HCl emissions. The Hunter and Huntington Power Plants are permitted by DAQ under Title V permits; both plants were originally constructed in the 1970s (see Appendix E). Hunter and Huntington power plants combust approximately 6.4 million tons of coal annually. In 2019, the total reported mercury emissions to the atmosphere from fugitive and stack sources at Hunter and Huntington Power Plants was 5.9 pounds (approximately 0.003 TPY).

Table 3-3. 2014 Total Emission Inventory for Emery County and Carbon County

Pollutant	Emery County Emissions (tons per year)	Carbon County Emissions (tons per year)
CO	17,854	8,045
NO_x	20,397	6,318
PM_{10}	4,891	4,928
$PM_{2.5}$	1,257	866
SO_2	6,427	10,334
Volatile organic compounds	36,111	17,014
Hazardous air pollutants	127	78

Source: DAQ (2014).

Mercury emissions are included in the HAPs category (see Section 3.2.1.1). Mercury emissions are a very small fraction of the total HAPs emissions. In 2017, Carbon County reported 0.00052 TPY of mercury and Emery County reported 0.0028 TPY of mercury (DAQ 2019) (see Appendix E).

Climate Change

Global warming refers to the ongoing rise in global average temperature near the Earth's surface. It is caused mostly by increasing concentrations of GHGs (primarily carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], and fluorinated gases) in the atmosphere, and it is changing global climate patterns. Climate change refers to any significant change in the measures of climate (e.g., temperature, precipitation, and wind patterns) lasting for an extended period of time (EPA 2017a). Estimates of GHG emissions are usually reported in terms of carbon dioxide equivalent (CO_2e) to account for the relative global warming potential (GWP) of each pollutant and to allow comparison between different greenhouse gases. GWP is a measure of a given pollutant's ability to trap heat and depends on how well the gas absorbs energy and how long the gas stays in the atmosphere. Both CH_4 and N_2O emissions are converted to CO_2e emissions using GWP factors. GWP is calculated over a specific time, typically 100 years. In the air technical

report, GHG emissions are presented in short tons, and CO_2e is based on the following 100-year values from the Intergovernmental Panel on Climate Change (IPCC) *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (AR5) (IPCC 2014): CO_2 GWP of 1, CH_4 GWP of 28, and N_2O GWP of 265 (SWCA 2019).

Because GHGs circulate freely throughout Earth's atmosphere, climate change is a global issue. The largest component of global anthropogenic GHG emissions is CO_2 (EPA 2016b). Fossil fuel use is the primary source of global CO_2 (EPA 2016b). Overall, U.S. energy-related emissions from the U.S. energy sector (fossil fuel combustion, natural gas systems, coal mining, mobile combustion, waste incineration, and other sources) accounted for a combined 84.0% of total U.S. greenhouse gas emissions in 2017 (EPA 2019a).

In 2018, total gross United States GHG emissions were 6,676.6 million metric tons (MMT) of CO_2e. Total United States emissions increased by 3.7% from 1990 to 2018; emissions increased from 2017 to 2018 by 2.9% (EPA 2020). Between 2017 and 2018, the increase in total GHG emissions was largely driven by an increase in CO_2 emissions from fossil fuel combustion. The increase in CO_2 emissions from fossil fuel combustion was a result of multiple factors, including increased energy use from greater heating and cooling needs due to a colder winter and hotter summer in 2018 compared to 2017 (EPA 2020). Methane emissions account for nearly 10% of emissions and have decreased by 7% since 2005 and 18.1% since 1990. The major sources of methane include enteric fermentation associated with domestic livestock, natural gas systems, and decomposition of wastes in landfills (EPA 2020).

Global climate is changing rapidly compared to the pace of natural climate variations that have occurred throughout Earth's history. Evidence for these changes consistently points to human activities, especially emission of GHGs, as the dominant cause. Global average temperature has increased by approximately 1.8°F from 1901 to 2016. Without significant emission reductions, annual average global temperatures could increase by 9°F or more by the end of this century (compared to preindustrial temperatures) (Hayhoe et al. 2018).

A recent study identified climate change issues relevant to resource management in all of Utah and Nevada, a small part of eastern California, a small part of western Colorado, southern Idaho, and western Wyoming (the Intermountain Region) (Halofsky et al. 2018). In the Plateaus subregion of the Intermountain Region (which covers the southern half of Utah, a small portion of western Colorado, and includes the proposed lease modification areas), median maximum temperature and median minimum temperature are projected to rise between 5°F to 10°F and 5°F to 12°F by 2100, respectively, depending on the climate model scenario (Halofsky et al. 2018). The greatest departure from historical temperatures by 2100 is projected to occur in summer. Projected median maximum temperatures for winter, spring, and autumn also move outside of historical ranges by 2100. Precipitation projections in the Plateaus subregion are highly variable with no discernible trend (Halofsky et al. 2018).

3.2.2 Environmental Impacts – Alternative A: No Action

Under the No Action Alternative, the BLM would not approve UEI's application for federal coal reserves on approximately 1,272.64 acres (317.84 acres added to lease UTU-014218 and 954.80 acres added to lease UTU-0126947) and the federal coal resources contained in the two lease modifications would not be mined. The coal reserves in the lease modifications would most likely be permanently bypassed.

Lila Canyon Mine would continue to operate at current production levels and emit air pollutants. Emissions of air pollutants would be limited by the 4.5 million TPY production rate condition established in its 2013 approval order. The projected mine life and operating plans of the Lila Canyon Mine are anticipated to extend through the year 2026. Other existing sources of air pollution (e.g., SCT, mobile sources), potentially including reasonably foreseeable future actions, would continue to impact air quality in the analysis area. The Hunter and Huntington Power Plants would continue operating as permitted.

3.2.2.1 Cumulative Effects

A choice of No Action would not contribute incrementally to the impacts of past, present, and reasonably foreseeable future actions, because under the No Action Alternative, the BLM would not approve UEI's application for federal coal reserves and would not allow extraction of the additional recoverable coal at this time. As a result, a No Action Alternative cumulative impacts analysis is not included.

3.2.3 Environmental Impacts – Alternative B: Proposed Action

Emissions of air pollutants at the Lila Canyon Mine are currently limited by a production rate condition established in its 2013 approval order. The mining of the proposed lease modification areas would extend by approximately two to three years the mining activities currently allowed under the 2013 approval order but would not increase the annual permitted emissions. The Proposed Action would not authorize a change in already permitted actions for the maximum production limitation or in annual emissions.

As previously stated, the Williams Draw LBA is contiguous with the Lila Canyon Mine and would use the Lila Canyon Mine surface facilities and infrastructure if offered for lease and if UEI is the successful bidder of the Williams Draw LBA. The proposed lease modification areas are also contiguous to the Lila Canyon Mine and would use Lila Canyon Mine facilities and infrastructure if the lease modifications are approved. Coal from both projects would follow the same potential paths from the Lila Canyon Mine to the SCT to its end destination. Both projects would occur under the Lila Canyon Mine's existing approval order (which limits annual production to 4.5 million tons of coal) and SCT's existing approval order (which limits coal throughput to 9.5 million tons of coal per rolling 12-month period). The Williams Draw LBA emission inventory is generally based on these approval order limits. Because the same facility production limits would remain in effect for the processing of coal from the proposed lease modification areas, the Williams Draw emissions data from the modeling protocol is used here as a proxy analysis for the proposed LMAs.

3.2.3.1 Direct Emissions

Under the Proposed Action, direct emissions would result from the mining of the coal in the lease modification areas and the hauling of the mined coal to the existing Savage Coal Terminal. These emissions would include CO, VOCs, NO_x, SO_2, PM_{10}, $PM_{2.5}$, HAPs, and GHGs.

Stationary sources of direct emissions at the Lila Canyon Mine include material handling conveyors, mine ventilation shafts, internal combustion engines, fuel storage tanks, a material processing screen and crusher, and surface operations. Except for particulate matter, all of the directly emitted criteria pollutants from mine operations would be from fuel combustion sources,

such as mobile mining equipment, haul trucks, and stationary sources (e.g., emergency generators, firewater pump engines). Methane would be emitted by the ventilation air handling system required by the Mine Safety and Health Administration to reduce the combustion/explosion potential of the Mine's underground atmosphere (also known as ventilation-air methane or VAM). According to information provided by the Lila Canyon Mine, methane and VOC concentrations are below detectable limits in the ventilation exhaust air (BLM 2018).

Mobile sources include underground mining equipment (specialized industry-specific equipment designed for underground mining), aboveground sources such as heavy construction equipment for material handling and stockpile management, and light-duty gasoline trucks and light- and heavy-duty diesel trucks. On-road vehicles would include coal haul trucks and employee vehicles. Coal haul trucks would travel 30 miles each way to and from Lila Canyon Mine and the SCT. Emissions would also result from worker trips to and from the Mine. The average employee would travel 34 miles each way from the Lila Canyon Mine to Price, Utah (SWCA 2019).

At the Lila Canyon Mine, coal dust associated with mine surface operations is controlled on the conveyor system and at transfer points by enclosures and sprays. Dust from unpaved mine access roads is controlled by applying water or a dust-suppressing solution. Coal is reclaimed from the bottom of the coal stockpile directly onto a conveyor belt in an enclosed tunnel located under the pile. The coal moisture level in the coal pile is maintained at approximately 6.5% or greater by water sprays located on the main mine conveyor. The speed is also limited to 15 miles per hour along on-site haul roads. The following control measures were assumed in the development of the emission inventory:

- Coal bulldozing: Continuous water spray during material handling with a control efficiency of 62%.
- Coal handling and storage piles: Assumed best practice of chemical treatment and watering with a control efficiency of 90%.
- On-site haul roads: Assumed best practice of chemical treatment and watering and reduced speeds on roads to 15 miles per hour with a control efficiency of 95%.
- Underground nonroad engines: All engines are Tier 2 based on age, except mantrips which are Tier 3.
- Aboveground nonroad engines: All engines are Tier 1.
- Disturbed surface areas: Assumed best practice of chemical treatment and watering with a control efficiency of 50%.

Maximum annual direct emissions for the Proposed Action are summarized in Tables 3-4, 3-5, and 3-6. Emission calculations were based on the assumption of a maximum production rate of 4.5 million tons per year and coal loading and hauling operating hours of 24 hours per day, 365 days per year. Additional assumptions can be found in the air technical report (SWCA 2019).

Mobile source HAP emissions result from fuel combustion in both road and non-road vehicles. However, because VOC emissions from coal mine venting are poorly understood, a gas analysis of vented air at the Lila Canyon Mine was unavailable (methane venting emissions were below detectable levels), and the Colorado Underground Coal Mine Emission Inventory Tool (V1.0)

does not include any HAP speciation emission factors; only HAP emissions from mobile sources were analyzed.

Table 3-4. Direct Criteria Pollutant Emissions

Emission Source	Annual Criteria Pollutant Emissions (tons per year)					
	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$
Conveyor transfers and drops	—	—	—	—	0.08	0.01
Crushing and screening*	—	—	—	—	1.11	1.11
Coal pile	—	—	—	—	2.20	0.33
Haul road – paved	—	—	—	—	1.33	0.33
Rock dust silo	—	—	—	—	<0.01	<0.01
Diesel storage tanks	—	—	0.09	—	—	—
Mine vents (includes underground equipment)	21.14	30.55	1.61	0.03	13.10	2.43
Aboveground equipment	28.63	23.44	3.10	0.02	1.43	1.31
On-road vehicles: coal haul trucks to Savage Coal Terminal (fugitive dust and exhaust)	13.21	48.29	2.64	0.09	10.49	4.07
On-road vehicles: worker commute (fugitive dust and exhaust)	11.41	1.01	0.29	0.01	5.75	1.41
Total	**74.39**	**103.29**	**7.73**	**0.15**	**35.49**	**11.01**

Source: SWCA (2019).

*There is no emission factor for $PM_{2.5}$. However, AP-42 suggests that the emission factors for PM_{10} may be used as an upper limit for $PM_{2.5}$ emissions from crushing. Conservatively, it was assumed that the emission factors for PM_{10} would also be an upper limit for $PM_{2.5}$ emissions from screening.

Table 3-5. Direct GHG Emissions

Emission Source	Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Conveyor transfers and drops	—	—	—	—
Crushing and screening	—	—	—	—
Coal pile	—	—	—	—
Haul road – paved	—	—	—	—
Rock dust silo	—	—	—	—
Diesel storage tanks	—	—	—	—
Mine vents (includes underground equipment)	67,883	1,622	2	113,769
Aboveground equipment	37,734	2	1	38,050
On-road vehicles: Coal haul trucks to Savage Coal Terminal (fugitive dust and exhaust)	n/a	n/a	n/a	10,306
On-road vehicles: Worker commute (fugitive dust and exhaust)	n/a	n/a	n/a	1,696
Total Maximum Annual Emissions	**117,618**	**1,625**	**3**	**163,821**
Life of LMAs Emissions*	**191,129**	**2,641**	**5**	**266,209**

Source: SWCA (2019).

n/a: Not applicable. On-road vehicles' CO_2e emissions were obtained from existing MOBILE 6 emissions factors. CO_2, CH_4, and N_2O emissions are listed as n/a for on-road vehicles even though CO_2e is calculated and listed. The totals do not currently include the emissions from source categories listed n/a.

Notes: GHG emissions are reported in short (U.S.) tons (1 metric ton = 1.10231 U.S. tons), and CO_2e is based on 100-year values. The global warming potential for each GHG is 1 for CO_2, 28 for CH_4, and 265 for N_20 (based on 100-year GHP AR 5 values).

* Calculated based on total LMAs' recoverable coal of 7.2 million tons as 1.625 factor of 4.5 million tons permitted annual maximum.

Table 3-6. Direct HAP Emissions

Emission Source	Annual HAP Emissions (tons per year)					
	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Aldehydes
Conveyor transfers and drops	—	—	—	—	—	—
Crushing and screening	—	—	—	—	—	—
Coal pile	—	—	—	—	—	—
Haul road – paved	—	—	—	—	—	—
Rock dust silo	—	—	—	—	—	—
Diesel storage tanks	—	—	—	—	—	—
Mine vents	0.020	—	—	—	—	0.041
Aboveground equipment	0.009	—	—	—	—	0.010
On-road vehicles: Coal haul trucks to Savage Coal Terminal (fugitive dust and exhaust)	0.022	—	—	—	—	0.341
On-road vehicles: Worker commute (fugitive dust and exhaust)	0.007	—	—	—	—	0.005
Total	0.058	—	—	—	—	0.396

Source: SWCA (2019).

3.2.3.2 Indirect Emissions

Savage Coal Terminal and Coal Hauling Indirect Emissions

Under the Proposed Action, indirect emissions would result from handling the mined coal at the SCT; hauling the coal from the SCT to a regional coal-fired power plant via haul trucks or to a generic U.S. port located along the Gulf of Mexico via locomotive for export; and the combustion of coal. It is not expected that the SCT's approval order would need to be modified in response to the proposed project.

Stationary sources of emissions at the SCT include coal truck unloading facilities, material handling conveyors, a wash plant, internal combustion engines, a natural gas-fired boiler, fuel storage tanks, a fuel dispensing station, a material processing screen and crusher, and onsite haul roads. On-road vehicles would include coal haul trucks and employee vehicles. Locomotive emissions from hauling mined and processed coal are currently occurring in the analysis area and would continue under the Proposed Action.

The following assumptions were used in the development of the emission inventory:

- A 64-mile round trip along designated truck routes from the SCT to a regional coal-fired power plant, with an average capacity of 46 tons of coal per truck and a maximum of 11.2 trucks per hour (4.5 million tons of coal per year).
- A 3,200-mile round trip along designated rail routes from the SCT to a generic U.S. export port (the exact port of export is not known; a gulf port was selected as a reasonable approximation for emissions), with an average capacity of 120 tons of coal per railcar, 120 cars per unit train, and a maximum of 312.5-unit trains per year (4.5 million tons of coal per year).

Additional assumptions can be found in the air technical report (SWCA 2019). Tables 3-7, 3-8, and 3-9 summarize the indirect emissions from the handling of coal at the SCT and transporting the coal to its final destination. The totals in Table 3-7 and Table 3-8 represent the maximum

indirect emissions if all project coal was shipped via locomotive to a generic U.S. export port located along the Gulf of Mexico.

Table 3-7. Indirect Criteria Pollutant Emissions

Emission Source	Annual Criteria Pollutant Emissions (tons per year)					
	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$
Savage Coal Terminal: Coal handling	4.35	9.25	7.27	0.28	42.39	6.21
On-road vehicles: Hauling coal from Savage Coal Terminal to regional power plant (fugitive dust and exhaust)	14.09	51.51	2.82	0.09	11.19	4.35
Locomotives: Hauling coal from the Savage Coal Terminal to a U.S. port along the Gulf of Mexico	873.15	3,246.77	124.32	3.10	75.43	73.17
Total indirect emissions when all coal is exported	**877.51**	**3,256.02**	**131.59**	**3.38**	**117.82**	**79.37**

Source: SWCA (2019).

Table 3-8. Indirect GHG Emissions

Emission Source	Maximum Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Savage Coal Terminal: Coal handling	6,383	<1	<1	6,506
On-road vehicles: Hauling coal from Savage Coal Terminal to regional power plant (fugitive dust and exhaust)	n/a	n/a	n/a	10,993
Locomotives: Hauling coal from the Savage Coal Terminal to a U.S. port along the Gulf of Mexico	336,951	26	9	339,945
Total indirect emissions when all coal is exported	**343,334**	**27**	**10**	**357,444**

Source: SWCA (2019).

n/a: Not applicable. On-road vehicles' CO_2e emissions were obtained from existing MOBILE 6 emissions factors. CO_2, CH_4, and N_2O emissions are listed as n/a for on-road vehicles even though CO_2e is calculated and listed. The totals do not currently include the emissions from source categories listed n/a.

Note: GHG emissions are reported in short (U.S.) tons, and CO_2e is based on 100-year values (IPCC 2014).

Table 3-9. Indirect HAP Emissions from Mobile Sources

Emission Source	Annual HAP Emissions (tons per year)					
	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Aldehydes
Transloading of crude oil	0.012	0.004	–	–	0.294	–
Fugitive component leaks	<0.001	<0.001	–	–	0.119	–
Railcar crude oil storage	<0.001	<0.001	–	–	0.038	–
Railcar boiler	–	–	–	–	–	–
Fuel storage tanks	–	–	–	–	–	–
Gasoline fueling	–	–	–	–	–	–
Emergency generator	0.082	0.036	–	0.025	–	0.170
Haul roads	–	–	–	–	–	–
Coal truck unloading	–	–	–	–	–	–
Coal crushing	–	–	–	–	–	–
Coal conveyor transfers and drops	–	–	–	–	–	–

Emission Source	Annual HAP Emissions (tons per year)					
	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Aldehydes
Coal railcar loading	–	–	–	–	–	–
Coal pile	–	–	–	–	–	–
Potash unloading	–	–	–	–	–	–
Potash rail car loading	–	–	–	–	–	–
Locomotives	0.802	–	–	–	–	0.108
Total	**0.897**	**0.040**	–	**0.025**	**0.451**	**0.278**

Source: SWCA (2019).

Coal Combustion Indirect Emissions

Coal combustion is considered an indirect impact because it is a reasonable end result of mining activity in the proposed LMA areas. If issued a modified lease for the Proposed Action, UEI could continue to provide coal to regional plants, or the coal could be transported to a U.S. port for export and combusted outside of the United States. UEI could also continue providing coal to the lime cement market and the spot market, or it could expand its customer base to other markets.

When combusted at a power plant, the coal mined from the proposed LMA areas would indirectly contribute to criteria pollutant, HAP, GHG, and other toxic air pollutant emissions. Domestic power plants are required to obtain air permits to operate; these permits restrict criteria and HAP pollutant emissions and require pollutant control technology to protect public health and the environment. Power plants must also ensure compliance with the NAAQS and any other applicable regulations (e.g., mercury). If a power plant accepts coal from a new source such as the proposed LMA areas, it would still have to maintain compliance with its air permit, any associated requirements, and emission limitations. Based upon historic coal combustion at Hunter and Huntington Power Plants (SWCA 2019), it is reasonable to assume for analysis purposes that all of the coal from the LMAs would be combusted at regional power plants such as Hunter and Huntington, under the limitations of their existing air permit and with appropriate pollutant control technology.

Combustion of the mined and processed coal would produce indirect emissions of criteria pollutants, HAPs, and GHGs (see Appendix E). Permitted emissions from regional power plants are provided in the air technical report (SWCA 2019:Tables 14 and 15).

To estimate emissions from the combustion of the mined coal, criteria and HAP emission factors from U.S. EPA AP-42, Section 1.1., Bituminous and Subbituminous Coal Combustion, were obtained (EPA 1998). The analysis assumes a maximum of 4.5 million tons of coal would be combusted per year. The heat content of the bituminous coal is assumed to be 11,695 British thermal units/pound, the sulfur content is assumed to be 1% by weight, and the ash content is assumed to be 11.25% by weight (SWCA 2019). Indirect annual criteria pollutant, GHG, and select HAP emissions from the combustion of the coal are summarized in Tables 3-10 and 3-11. Mercury emissions from the combustion of 4.5 million tons of coal annually would be approximately 70% of mercury emissions from Hunter and Huntington Power Plants combined, or approximately 4.1 lbs. These emissions are 0.2% of the 1,680 lbs (0.84 tons/year) shown in Table 3-10 (see Appendix E).

Table 3-10. Combustion of Coal Criteria Pollutant and HAP Emissions

Emission Source	Annual Criteria Pollutant and HAP Emissions (tons per year)								
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	Hydrochloric Acid (HCl)	Hydrofluoric Acid	Mercury
Coal combustion	1,125	33,750	15,188	58,219	85,500	21	2,700	338	0.84

Source: SWCA (2019).

Table 3-11. Combustion of Coal GHG Emissions

Emission Source	Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Coal combustion	10,822,685	1,276	186	10,907,614

Source: SWCA (2019).

Note: CO_2e emissions based on 100-year GWP for CO_2, CH_4, and N_2O.

3.2.3.3 Greenhouse Gas Emissions Assessment

The GHG emissions assessment assumes that 100% of the coal produced would be combusted. Regional GHG impacts from the Proposed Action include transport to the regional power plant (a fully loaded trip to the plant and an empty return trip) and combustion of all the produced coal by the regional power plant. Global GHG impacts from the Proposed Action include transporting the coal to a generic U.S. port (a fully loaded trip to the port and an empty return trip) and combustion of all coal produced. Calculated emissions of CO_2, methane, and N_2O were converted to CO_2e by the appropriate GWP factor. Table 3-12 summarizes the total annual direct and indirect GHG emissions that would be generated by the Proposed Action. The emissions in these tables are from Tables 3-5, 3-8, and 3-11.

Table 3-12. Summary of Estimated Direct and Indirect GHG Emissions

Emission Source	Total Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Direct operations (all direct mine emission sources, including coal haul trucks to Savage Coal Terminal and worker commute vehicles)	117,618	1,625	3	163,821
Indirect operations (i.e., Savage Coal Terminal, vehicles hauling coal to a regional power plant, and locomotives)	343,334	26	9	357,444
Indirect combustion of produced coal (Combustion of Lila Canyon–produced coal)	10,822,685	1,276	186	10,907,614
Total	**11,283,637**	**2,927**	**198**	**11,428,879**

Note: CO_2e emissions based on 100-year GWP for CO_2, CH_4, and N_2O.

Table 3-13 shows estimated GHG emissions for the Proposed Action (lease modification areas) compared with local, state, and national totals reported by the EPA, as well as a regional total from the states of Utah, Wyoming, New Mexico, and Colorado as reported in Appendix D.

Table 3-13. Project, Local, Regional, and National Greenhouse Gas Emissions

Project, Local, Regional, and National GHG Emission Comparison (million metric tons of CO_2e per year)				
Estimated Lease Modification Areas Emissions	**Emery County GHG Emissions in 2018***	**State of Utah GHG Emissions in 2018***	**Region (WY, CO, NM, UT) GHG Emissions in 2019††**	**U.S. GHG Emissions in 2017†**
11.4	13.5	35.1	940.1	6,456.7

* Data from EPA (2018).
† Data from EPA (2019a).
†† see Appendix D.

The Proposed Action–related CO_{2e} GHG emissions are estimated to be approximately 11.4 MMT per year. Proposed Action-direct CO_{2e} GHG emissions are estimated at 163,821 tons per year (Table 3-12), while emissions from indirect operations are estimated at 357,444 tons per year. The balance results from the indirect combustion of the Lila Canyon Mine produced coal. Comparison of the Proposed Action-related (indirect) CO_{2e} GHG emissions to the Emery County and Utah statewide emission totals is only appropriate at the national level as BLM does not exercise control over the specific end use of the coal produced from any individual federal lease and has no authority to direct or regulate the end use of the produced products. In addition, the indirect CO_{2e} GHG emissions are already accounted for in the existing county, state and national emission inventories as the Proposed Action involves lease modifications that would extend mining activities currently allowed but would not authorize a change in the already permitted actions for the maximum production of coal. As a result, the BLM provides an estimate of potential GHG emissions by assuming that all produced products would eventually be combusted. The Proposed Action-direct CO_{2e} GHG emissions are approximately 1.2% of Emery County's 2018 GHG emissions and 0.5% of statewide GHG emissions. The Proposed Action-direct and indirect related CO2e GHG emissions are approximately 0.2% of U.S. GHG emissions in 2017. The statewide emissions are from major industrial sources only. Statewide GHG emissions totals from other sectors (e.g., residential/commercial, transportation, and agriculture) are not currently available for 2018; the percentage of statewide GHG emissions attributable to the Proposed Action would be lower if all sectors were included.

Although this EA presents a quantified estimate of potential GHG emissions associated with the proposed LMA coal development at the maximum permitted rate (4.5 million tons of coal production per year), there is uncertainty in GHG emission estimates due to market-driven variations in production volumes, and transportation. Variation in markets and other factors would only reduce emissions/impacts from what is analyzed. Additionally, it is difficult to discern what end uses for the coal extracted from a particular leasehold might be reasonably foreseeable. The BLM does not exercise control over the specific end use of the coal produced from any individual federal lease and has no authority to direct or regulate the end use of the produced products. As a result, the BLM can only provide an estimate of potential GHG emissions by assuming that all produced products would eventually be combusted.

The climate change research community has not yet developed tools specifically intended for evaluating or quantifying end-point impacts attributable to the emissions of GHGs from a single source and has not identified any scientific literature to draw from regarding the climate effects of individual, facility-level GHG emissions. The current tools for simulating climate change generally focus on global and regional-scale modeling. Global and regional-scale models lack the capability to accurately represent many important small-scale processes. As a result,

confidence in the accuracy of regional- and sub-regional-scale projections is lower than at the global scale. While climate models account for global emissions, they do not provide estimates for impacts from a single source in isolation of other sources.

There are no federal or state GHG emission standards to assist in evaluating a single source's potential impacts on climate. Thus, the GHG emissions estimates are presented here as a proxy for the potential climate change impact from the Proposed Action. The direct and indirect emission estimates previously provided are an estimate of the maximum potential for GHGs released into the atmosphere from mining to end use. Such emissions would incrementally add to the national and global emissions driving climate change (see Other Regulations in Section 3.2.1.1).

3.2.3.4 Near-Field Modeling Analysis

Because the same facility production limits would remain in effect for the processing of coal from the proposed LMA areas, the Williams Draw near-field modeling analysis is used here as a proxy analysis for the proposed LMAs. The modeling methodology, model configuration, meteorological data used, receptor placement, and other inputs and assumptions are described in the air technical report (SWCA 2019).

Air Quality Modeling Impact Assessment

A near-field criteria pollutant assessment was performed to estimate maximum potential impacts of criteria pollutants from Proposed Action emission sources. Predicted (modeled) maximum criteria pollutant concentrations are presented in Table 3-14. The maximum predicted concentrations vary based on the form of the NAAQS and the pollutant averaging period. For each criteria pollutant, the maximum predicted concentration is defined as:

- NO_2 and $PM_{2.5}$ annual average: The highest modeled annual averaged values over all 5 years.
- CO 1-hour and 8-hour, and SO_2 3-hour: The highest 2nd high (H2H) over 5 years.
- NO_2 1-hour: The 5-year mean of the 8th-highest (H8H) daily 1-hour maximum (average H8H of daily maxima)
- SO_2 1-hour: The 5-year mean of the 4th-highest (H4H) daily maximum.
- $PM_{2.5}$ 24-hour: The 5-year mean of the highest 8th high (H8H).
- PM_{10} 24-hour: The high 6th high (H6H) averaged over 5 years.

The modeling was performed using 5 years of hourly meteorological input data. The modeled impacts were also assessed at receptors within the modeled domain that are within the following three areas: Turtle Canyon Wilderness, Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry, and Desolation Canyon Wilderness (SWCA 2019).

Table 3-14. Maximum Ambient Concentrations from Modeling

Pollutant	Averaging Period	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Maximum Ambient Concentration (µg/m³)	NAAQS (µg/m³)	Percent of Standard (%)
CO	1-hour*	14,643.4	1,718.0	16,361.4	40,000	40.9
	8-hour*	2,634.0	1,489.0	4,123.0	10,000	41.2
NO_2	Scenario 1 1-hour†	890.8	34.0	924.8	188.7	491.9
	Scenario 2 1-hour†	1,344.5	34.0	1,378.5	188.7	733.3
	Annual	53.6	12.0	65.6	100	65.6
PM_{10}	24-hour‡	535.6	42.0	577.6	150	385.1
$PM_{2.5}$	24-hour§	112.5	24.0	136.5	35	390.1
	Annual	24.2	6.1	30.3	15	252.9
SO_2	1-hour¶	20.0	18.0	38.0	195	19.4
	3-hour*	7.6	17.0	24.6	1,300	1.9

Source: SWCA (2019).

* Represents the high 2nd high concentration.

† Represents the 98th percentile concentration over a 5-year period.

‡ Represents the 4th-highest concentration over a 5-year period.

§ Represents the average of the highest 24-hour concentrations over a 5-year period.

¶ Represents the 99th percentile concentration over a 5-year period.

As shown in Table 3-14, the modeled plus background values for CO (1-hour and 8-hour), NO_2 (annual), and SO_2 (1-hour and 3-hour) are less than the NAAQS. Modeled concentrations of NO_2 (1-hour), PM_{10} (24-hour), and $PM_{2.5}$ (24-hour and annual) show potential exceedances of the NAAQS and are discussed in more detail below.

NO_2 Evaluation

Potential exceedances of the 1-hour NO_2 NAAQS are predicted to occur within 200 meters of the existing Lila Canyon Mine adits, but within the mine lease boundary. Both the adits and predicted exceedances are located inside the lease boundary. The relatively large contribution of mine vent emissions to the maximum 1-hour impact is explained by the receptor's very close proximity to the adits. Potential exceedances of the 1-hour NO_2 NAAQS are also expected to occur within 20 meters of the southern Lila Canyon Mine property boundary. They are expected to occur in areas that are difficult for the public to access due to terrain and vegetation. The relatively large contribution of mine vent emissions to the maximum 1-hour impact is explained by the receptor's very close proximity to the ambient air quality boundary used for the modeling analysis, the low exit velocity, the rugged terrain, and the elevated emissions associated with these activities (SWCA 2019).

Modeled ambient concentrations of NO_2 (1-hour and annual) at the three Class II areas of interest (Turtle Canyon Wilderness, the Jurassic National Monument at the site of the Cleveland Lloyd Dinosaur Quarry, and Desolation Canyon Wilderness) are all expected to be below the NAAQS. The 1-hour and annual NO_2 impacts at the closest Class II area are about 21.1% and 12.1% of their respective NAAQS (SWCA 2019).

PM_{10} Evaluation

The predicted H6H 24-hour PM_{10} concentrations indicate potential NAAQS exceedances within approximately 10 meters of the SCT's fence line and within 68 meters from the existing mine adits. The elevated impact near the mine adits can be attributed to emissions associated with underground mine activities, but the predicted exceedances are located within the lease boundary (SWCA 2019).

Conditions in the mine are cool and damp. A humid environment, combined with the moisture content of ore and development rock, is not conducive to dust generation. In addition, on August 1, 2016, Phase III of MSHA's respirable dust rule went into effect. This lowering of the concentration of respirable coal mine dust in the air that miners breathe is the most effective means of preventing diseases caused by excessive exposure to such dust (MSHA 2014). In addition, it would also limit the amount of PM_{10} emissions to the atmosphere from the mine adits. The PM_{10} modeling results can be considered conservative for two reasons: 1) no control was assumed for the humid conditions in the mine, and 2) the MSHA respirable dust limit was not accounted for in the modeling demonstration (SWCA 2019).

In accordance with 30 CFR 7.84(e), exhaust PM emissions would be diluted to 1 mg/m^3. In addition, 30 CFR 70.100 establishes concentration limits for respirable coal mine dust of 1.5 mg/m^3 at underground coal mines. A dilution of 1 mg/m^3 is equivalent to 1,000 $\mu g/m^3$, which is higher than the predicted PM_{10} and $PM_{2.5}$ modeled maximums at the adit exits (535.6 $\mu g/m^3$ for 24-hour PM_{10} and 112.5 $\mu g/m^3$ for 24-hour $PM_{2.5}$).

The modeled PM_{10} impacts from project emissions, in combination with conservative background concentrations, show that the Proposed Action would not cause an exceedance of the 24-hour NAAQS.

$PM_{2.5}$ Evaluation

The predicted H8H 24-hour average $PM_{2.5}$ concentration indicates a potential NAAQS exceedance. This potential exceedance is partially due to the high background ambient concentration of 24.0 $\mu g/m^3$, which is already 68.6% of the NAAQS (SWCA 2019). The predicted maximum impacts and potential exceedances of the 24-hour $PM_{2.5}$ NAAQS are expected to occur within 88 meters south and 50 meters north of the Lila Canyon Mine ambient air boundary and within 100 meters of the existing mine adits. Similarly, at the SCT, the area of potential exceedance is located within 59 meters of the southwest boundary.

Potential annual $PM_{2.5}$ exceedances are located at a maximum distance of 25 meters south of the Lila Canyon Mine, 35 meters from the existing mine adits, and 32 meters southwest of the SCT. Potential exceedances would occur in areas that are difficult for the public to access because of challenging terrain and vegetation. Furthermore, respirable dust emissions exiting the adits are those legally allowed in the mine atmosphere (an average concentration of respirable dust at or below 1.5 mg/m^3 in accordance with 30 CFR 70.100). The predicted exceedances around the existing adits occur and remain within the lease boundary (SWCA 2019).

As discussed for PM_{10}, because of the cool and damp mine conditions and the implementation of Phase III of MSHA's respirable dust rule, the $PM_{2.5}$ modeling results can be considered conservative because no control was assumed for the humid conditions in the mine, nor was the MSHA respirable dust limit accounted for in the modeling demonstration (SWCA 2019).

The modeled average daily and annual $PM_{2.5}$ concentrations do not exceed the NAAQS at any of the receptors within the modeled domain in the three Class II areas considered (SWCA 2019).

PSD Increment and Evaluation

The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) was used to model impacts at the Class I areas and Class II areas within the 50-km near-field domain. No Class I areas are located within 50 km of the proposed lease modification areas. The nearest Class I area is Arches National Park, which is approximately 53 miles (85 km) to the southeast. Other nearby Class I areas and their respective distances from the proposed LMA areas are Canyonlands National Park (68 miles [109.5 km]) and Capitol Reef National Park (77 miles [124 km]). The potential PSD impacts were modeled at the edges of the modeling domain (geographic area covered by the model) in the direction of and closest to the Class I areas and compared to the corresponding PSD increments (SWCA 2019). The PSD increment is the allowable increase in a pollutant's concentration over the baseline concentration under the Clean Air Act. The PSD increments prevent the air quality in clean areas from deteriorating to levels set by the NAAQS.

The Class II areas within the modeling domain that were modeled are Turtle Canyon Wilderness (approximately 1.5 miles to the east of the proposed LMA areas), Desolation Canyon Wilderness (approximately 5.2 miles to the east), and Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry (approximately 19 miles to the west-southwest). Impacts predicted at these three areas were well below the NAAQS and PSD increments (the maximum predicted impact is projected to be less than 1.44% of the PSD increment) (SWCA 2019).

Four pollutants (PM_{10}, $PM_{2.5}$, SO_2, and NO_2) were modeled with respect to the maximum allowable PSD increments in Class I areas. For all three Class I areas (Arches National Park, Canyonlands National Park, and Capitol Reef National Park) analyzed, none of the Class I PSD increments were exceeded (SWCA 2019). Detailed modeling results can be found in the air technical report.

Secondary $PM_{2.5}$ Analysis

NO_X and SO_2 gases have the potential to form secondary $PM_{2.5}$. $PM_{2.5}$ formation from these precursors is highly uncertain and varies both regionally and seasonally due to atmospheric conditions. Assessing the Proposed Action's potential to form secondary $PM_{2.5}$ includes the analysis of monitoring data and the inclusion of EPA's Modeled Emission Rates for Precursors (MERPs) approach (SWCA 2019).

For $PM_{2.5}$, the critical air quality thresholds are assumed to be equal to significant impact levels (i.e., $PM_{2.5}$ daily = 1.2 $\mu g/m^3$, $PM_{2.5}$ annual = 0.2 $g/\mu m^3$). The estimated annual NO_X and SO_2 direct emissions from the Proposed Action were compared against the lowest (most conservative) illustrative $PM_{2.5}$ MERP value for these pollutants shown in the EPA's MERPs guidance of any source modeled by the EPA in the western United States (SWCA 2019).

NO_X and SO_2 precursor contributions to both daily average $PM_{2.5}$ are considered together to determine if the Proposed Action's air quality impact to secondary $PM_{2.5}$ would exceed the critical air quality threshold. In this case, the proposed emissions increases are expressed as a percent of the lowest MERP for each precursor and have been summed. A value less than 100% indicates that the critical air quality threshold would not be exceeded when considering the

combined impacts of these precursors on daily and/or annual $PM_{2.5}$. The additive secondary impacts on daily $PM_{2.5}$ was calculated to be 9.33%.[4]

The presented method indicates that the emissions from the Proposed Action would not cause increases to secondary $PM_{2.5}$ concentrations in the area that exceed the critical air quality thresholds (SWCA 2019).

Ozone Analysis

To address whether the Proposed Action may cause or contribute to an exceedance of the ozone NAAQS, the ozone precursors, NO_x and VOC, were evaluated. The EPA guidance memorandum *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program* (EPA 2019b) was followed to determine the potential secondary pollutant impact resulting from the Proposed Action (SWCA 2019).

Using this methodology, potential ozone air quality impacts from the Proposed Action were compared against the applicable critical air quality threshold (1 ppb). The estimated annual NO_X and VOC emissions were compared against the lowest illustrative ozone MERP value shown in the EPA's guidance for any source modeled by the EPA in the western United States. A value less than 100% indicates that the critical air quality threshold would not be exceeded when considering the combined impacts of these precursors on daily and/or annual ozone. The additive secondary impacts on 8-hour ozone were calculated to be 56.87%.[5]

The presented method indicates that the Proposed Action is not expected to cause increases to secondary 8-hour ozone concentrations in the area that exceed the critical air quality thresholds (SWCA 2019).

Modeling for Visibility Impact Assessment

Federal land managers have developed a technique to screen small or distant sources so they would not cause or contribute to visibility impairment in Class I areas. The Federal Land Managers' Air Quality Related Values Work Group (FLAG) Report provides guidance on the protection of AQRVs and on how to assess potential visibility impairment from sources proposed near Class I airsheds (U.S. Forest Service et al. 2010). Because the proposed lease modification areas are more than 50 miles from the closest Class I area (Arches National Park), the FLAG 2010 initial screening guidance suggests summing the Proposed Action's tons per year emission rates for NO_X, SO_2, PM_{10}, and sulfuric acid mist (H_2SO_4), and dividing this value by the distance (km) from the proposed project to the nearest Class I area to evaluate potential impacts to AQRVs at that nearest Class I area. If this value (the Q/D value) is less than or equal to 10, no further analysis is required.

The distance from the proposed project to the closest border of the Class I area is 53 miles (85 km). Based on the estimated direct emissions from the Proposed Action in Table 3-4 and an estimated 0 tons per year of H_2SO_4 emissions, there would be a total of 139 tons per year of SO_2, NO_X, PM_{10}, and H_2SO_4. Dividing 139 by 85 results in a Q/D value of 1.54, which is less than 10. Therefore, the

[4] (103.29 TPY NO_x project /1,115 TPY NO_X daily $PM_{2.5}$ MERP) + (0.15 TPY SO_2 project/225 TPY SO_2 daily $PM_{2.5}$ MERP) = 0.092637 + 0.000667 = 0.093303 * 100 = 9.33%

[5] (103.29 TPY NO_X project /184 TPY NO_X MERP) + (7.73 TPY VOC project/1,049 TPY VOCMERP) =0.5613 + 0.00737 = 0.5687 * 100 = 56.87%

Proposed Action is not expected to adversely affect the nearest Class I area (or the other two farther away Class II areas). No additional visibility assessment is required (SWCA 2019).

Deposition Impact Assessment

A Level 1 deposition analysis was conducted for the Proposed Action to evaluate the possible effects of emissions on AQRVs in Class I and Class II areas of interest: Turtle Canyon Wilderness (approximately 1.5 miles to the east of the proposed LMA areas), Desolation Canyon Wilderness (approximately 5.2 miles to the east), and Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry (approximately 19 miles to the west-southwest). Results for the maximum deposition at each Class I and Class II area are provided in Table 3-15 for both nitrogen and sulfur (SWCA 2019). These results are compared to Deposition Analysis Thresholds (DATs). A DAT is defined as the additional amount of nitrogen or sulfur deposition below which estimated impacts from a proposed new or modified source are considered negligible (U.S. Forest Service et al. 2010).

Table 3-15. Estimated Maximum Sulfur and Nitrogen Deposition at Class I and Class II Areas of Interest (Level 1 analysis)

Constituent	DAT Value (kg/ha/year)	Arches National Park	Canyonlands National Park	Capitol Reef National Park	Turtle Canyon Wilderness	Jurassic National Monument at the Site of the Cleveland Lloyd Dinosaur Quarry	Desolation Canyon Wilderness
Sulfur	0.005	0.00005	0.0022	0.0002	0.00025	0.0007	0.0005
Nitrogen	0.005	0.00615	0.0984	0.0096	0.2399	0.0431	0.1980

Source: SWCA (2019).

Maximum deposition values for sulfur were all below the DAT of 0.005 kg/ha/year. Since nitrogen was unable to pass the Level 1 analysis (i.e., the maximum modeled deposition values at Class I and Class II areas were above the applicable DAT), a Level 2 deposition analysis was then conducted for this constituent. The Level 2 analysis uses AERMOD's deposition algorithms to provide an additional level of refinement beyond the Level 1 analysis (SWCA 2019). Level 2 results for the maximum nitrogen deposition at each Class I and Class II area are provided in Table 3-16.

Table 3-16. Estimated Maximum Nitrogen Deposition at Class I and Class II Areas of Interest (Level 2 analysis)

Constituent	DAT Value (kg/ha/year)	Arches National Park	Canyonlands National Park	Capitol Reef National Park	Turtle Canyon (then) Wilderness Study Area	Jurassic National Monument at the Site of the Cleveland Lloyd Dinosaur Quarry	Desolation Canyon (then) Wilderness Study Area
Nitrogen	0.005	3.4E-07	2.02E-06	4.6E-07	1.3E-05	1.6E-06	4.0E-06

Source: SWCA (2019).

Maximum deposition values for nitrogen were all below the DAT in the Level 2 analysis.

Hazardous Air Pollutants Impact Assessment

Small amounts of HAPs would be emitted as a result of the Proposed Action, as indicated in the emission inventory. HAPs can cause various adverse health effects, and high levels at the lease

boundary could indicate the need for further analysis or mitigation strategies. Therefore, HAPs have been modeled in the AERMOD near-field analysis (SWCA 2019).

The HAP impact assessment compares modeled HAPs concentrations to the following health exposure levels:

- Reference Exposure Levels (RELs): Used to assess acute inhalation exposures (i.e., 1-hour averages) and represent the concentrations at or below which no adverse health effects are expected.
- State of Utah's Toxic Screening Levels (TSLs): Derived from the Threshold Limit Values published in the American Conference of Government Industrial Hygienists *Threshold Limit Values for Chemical Substances and Physical Agents* and based on exposure limits to a healthy adult in the workplace.
- Reference Concentrations (RfC): Represent an estimate of chronic inhalation exposure (i.e., annual average) rate to humans, including sensitive subgroups (children and elderly), without an appreciable risk of harmful effects.

Modeled results for HAPs are shown in Table 3-17. Short-term (1-hour) maximum HAP concentrations are compared to acute (1-hour) RELs and TSLs; long-term (annual) maximum HAP concentrations are compared to chronic (annual) RfCs.

Table 3-17 shows no exceedances of RELs, TSLs, or RfCs.

The potential for non-cancer effects was evaluated by dividing the air exposure concentration by the RfC for each pollutant. This results in what is known as the non-cancer Hazard Quotient (HQ). The HQ for each of the pollutants shown in Table 3-17 is less than 0.03. The total Hazard Index (HI) is calculated by summing the individual HQs for each pollutant. The total HI is compared to the acceptable HI, defined by the EPA as 1. For the proposed project, the total HI is 0.045532512. Therefore, non-cancer risks from the proposed project are not expected from any chemical, alone or in combination with others (SWCA 2019).

Table 3-17. Highest Modeled Results with Acute RELs and Chronic RfCs (1-hour and annual exposure)

HAP	Acute Analysis				Chronic Analysis		
	1-hour REL (µg/m³)	TSL (µg/m³)*	Maximum Modeled 1-hour Concentration (µg/m³)	Complies with REL and TSL?	RfC (µg/m³)†	Maximum Modeled Annual Concentration (µg/m³)	Complies with RfC?
Acetaldehyde	470‡	4,504	11.68	Yes	9	0.09	Yes
Benzene	27‡	18	14.15	Yes	30	0.14	Yes
Formaldehyde	55‡	36.8	17.44	Yes	9.8§	0.27	Yes
n-Hexane	180,000¶	5,875	64.76	Yes	700	2.43	Yes
Toluene	37,000‡	2,512	1.57	Yes	5,000	0.04	Yes
Xylenes	22,000‡	14,473	1.10	Yes	100	0.02	Yes

Source: SWCA (2019).

* Utah Department of Environmental Quality (UDEQ) (2013).

† EPA (2019c).

‡ California Office of Environmental Health Hazard Assessment (2016).

§ The U.S. Agency for Toxic Substances and Disease Registry (ATSDR) chronic MRL of 0.008 ppm was used and converted to µg/m³ where 1 ppm = 1,230 µg/m³ for formaldehyde.

¶ National Institute for Occupational Safety and Health (2019).

To better characterize the risk associated with the modeled concentrations of HAPs, two estimates of cancer risk were performed (Table 3-18); one that corresponds to a most likely exposure (MLE), and one reflective of the maximally exposed individual (MEI). The analysis shows the potential for increased cancer risk for the MEI. The radius needed to predict below one-in-one-million cancer risk for the duration of MEI exposure period of 45 years was estimated at 31 meters from the existing mine adits.

The individual cancer risks for acetaldehyde and benzene are below one-in-one-million cancer risk for the MEI. Estimated cancer risk for formaldehyde is above the lower end of the threshold range of EPA's presumptively acceptable risks (1.0×10^{-4} to 1.0×10^{-6}), representing one excess cancer per 1 million people to one excess cancer per 10,000 people, respectively (SWCA 2019).

Table 3-18. Cancer Highest Risk Assessment: Carcinogenic HAP RfCs, Exposure Adjustment Factors, and Adjusted Exposure Risk

HAP	Carcinogenic Inhalation Unit Risk 1/(µg/m³)*	MLE Assessment			MEI Assessment		
		Exposure Adjustment Factor	Cancer Risk	Within Acceptable Limits?	Exposure Adjustment Factor	Cancer Risk	Within Acceptable Limits?
Formaldehyde	1.300E-05	0.095	3.35E-07	Yes	0.643	2.27E-06	Yes
Acetaldehyde	2.200E-06	0.095	1.81E-08	Yes	0.643	1.22E-07	Yes
Benzene	7.800E-06	0.095	1.02E-07	Yes	0.643	6.89E-07	Yes
Total			4.55E-07	Yes		3.08E-06	Yes

Source: SWCA (2019).

* Annual average concentration.

The results in Table 3-18 show that modeled long-term risk from acetaldehyde and benzene for the MLE and MEI are below $1x10^{-6}$. The MLE risk for formaldehyde is also below $1x10^{-6}$. The MEI risk for formaldehyde is within the acceptable range of 1 to $1x10^{-4}$. When benzene, acetaldehyde, and formaldehyde risks are added together, risks are below MLE and within the acceptable risk range (MEI) (SWCA 2019). The MEI analysis shows the potential for increased risk of cancer. Estimated cancer risk for formaldehyde is above the lower end of the threshold range of EPA's presumptively acceptable risks (1.0 × 10-4 to 1.0 × 10-6), representing 1 excess cancer per 1 million people to 1 excess cancer per 10,000 people, respectively. It should be noted that the maximum predicted concentrations and incremental risk estimates are very localized. The radius needed to predict below 1-in-1-million cancer risk for the duration of MEI exposure period of 45 years was estimated at 31 meters from the existing mine adits (SWCA 2019). It is highly unlikely that this MEI exposure situation could occur in reality; therefore, this risk is considered negligible.

3.2.3.5 Social Cost of Carbon

The Social Cost of Carbon (SCC) is an estimate of the economic impacts associated with an increase in carbon dioxide emissions (typically expressed as the cost in dollars per metric tons of emissions). A protocol to estimate the SCC associated with GHG emissions was developed by a federal Interagency Working Group to assist agencies in addressing Executive Order 12866, which requires assessment of the cost and the benefits of proposed regulations as part of their regulatory impact analyses. As explained in the Executive Summary of the 2015 *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact*

Analysis Under Executive Order 12866, "the purpose of the 'social cost of carbon' (SCC) estimates…is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO_2) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions." While the SCC protocol was created to meet the requirements for regulatory impact analyses during rulemakings, there have been requests by public commenters to expand the use of SCC estimates to project-level NEPA analyses.

The decision was made not to expand the use of the SCC protocol for this EA for a number of reasons. First, this action is not a rulemaking for which the SCC protocol was originally developed. Second, on March 28, 2017, the President issued Executive Order 13783, which, among other actions, withdrew the technical support documents on which the SCC protocol was based and disbanded the Interagency Working Group. The Executive Order further directed agencies to ensure that estimates of the social cost of GHGs used in regulatory analyses "are based on the best available science and economics" and are consistent with the guidance contained in Office of Management and Budget (OMB) Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates." In compliance with OMB Circular A-4, interim protocols have been developed for use in the rulemaking context. However, Circular A-4 does not apply to project-level NEPA analysis for a proposed project.

Further, NEPA does not require a cost-benefit analysis (40 CFR 1502.23), although it does require consideration of "effects" that include "economic" and "social" effects (40 CFR 1508.8(b)). Without a complete monetary cost-benefit analysis, which would include the social benefits of the Proposed Action to society as a whole, and other potential positive benefits, inclusion of a SCC cost analysis solely would be unbalanced, potentially inaccurate, and not useful in facilitating the authorized officer's decision on the Proposed Action. Any increased economic activity, in terms of revenue, employment, labor income, total value added, and output that is expected to occur as a result of the Proposed Action is simply an economic impact, rather than an economic benefit, because such impacts might be viewed by another person as negative or undesirable impacts due to potential increases in local population, competition for jobs, and concerns that changes in population will change the quality of the local community. Economic impact is distinct from "economic benefit" as defined in economic theory and methodology, and the socioeconomic impact analysis required under NEPA is distinct from cost-benefit analysis, which, as mentioned above, is not required.

Finally, the SCC protocol does not measure the actual incremental impacts of a project on the environment and does not include all positive or negative effects of carbon emissions. The SCC protocol estimates economic damages associated with an increase in CO2 emissions and includes, but is not limited to, potential changes in net agricultural productivity, human health, and property damages from increased flood risk over hundreds of years. The estimate is developed by aggregating results "across models, over time, across regions and impact categories, and across 150,000 scenarios" (Rose et al. 2014). The dollar cost figure arrived at based on a SCC calculation represents the value of damages avoided if, ultimately, there is no increase in carbon emissions. However, the dollar cost figure is generated in a range and provides little benefit in assisting the authorized officer's decision for project-level analyses. For example, in a recent EIS, OSMRE estimated that the selected alternative had a total SCC ranging from approximately $4.2 billion to $22.1 billion depending on dollar value and the discount rate used. The total SCC for the No Action alternative ranged from $2.0 billion to $10.7 billion. Given the uncertainties

associated with assigning a specific and accurate SCC resulting from the equivalent of two to three years of operation under the proposed Federal mining plan, and given that the SCC protocol and similar models were developed to estimate impacts of regulations over long time frames, this EA quantifies direct and indirect GHG emissions and evaluates these emissions in the context of county, state, and United States GHG emissions as discussed in Section 3.2.3.3 of this EA.

To summarize, this EA does not undertake an analysis of SCC because 1) it is not engaged in a rulemaking for which the protocol was originally developed; 2) the Interagency Working Group, technical supporting documents, and associated guidance have been withdrawn; 3) NEPA does not require cost-benefit analysis; and 4) the full social effects of coal-fired energy production have not been monetized, and quantifying only the costs of GHG emissions would yield information that is incomplete, potentially inaccurate, and not useful.

3.2.3.6 Cumulative Effects

Past, present, and reasonably foreseeable future actions affecting air quality and greenhouse gas emissions are listed in Appendix C and discussed in Section 3.1.2 and Appendix D.

Current emissions in the air quality analysis area are reflected in the ambient air quality data shown in Table 3-2. Estimated levels of mercury and selenium are described in Appendix E. Mining of the proposed lease modification areas would not increase annual emissions currently occurring from the Lila Canyon Mine because it would be a continuation of existing mining operations (there would be no change in annual production). However, the life of the Mine would be extended for approximately 2 to 3 years. The proportion of emissions over the 2 to 3-year period that would be directly attributable to the mining of the proposed LMA areas is unknown. However, the emissions from the proposed LMA areas during this 2 to 3-year period would add incrementally to any emissions in the analysis area from reasonably foreseeable future actions, such as underground coal mining in the Williams Draw area, if offered and leased, or the SITLA leases (T. 16 S., R. 14 E., sec. 36 and T. 16 S., R. 15 E., sec. 32). These future actions would require environmental analysis and UDEQ-issued air quality permits to ensure that emissions do not exceed the NAAQS before any mining begins. The proposed Uinta Basin Railway would also contribute to air quality effects and GHG emissions through increased rail line traffic in the region. However, at this very early stage of that proposal, it is not possible to estimate such effects and/or emissions.

Other reasonably foreseeable future actions (see Appendix C) that could contribute criteria pollutant emissions include oil and gas leasing (if APDs are approved subsequent to the BLM's quarterly oil and gas lease sales), the IACX Woodside Dome 1 APD, the Chalk Hills Mine Expansion, and projects that may cause temporary disturbances such as the East Carbon Junction Fiber project. These future actions would have to comply with their respective approval conditions, requirements, and permits.

The *Utah Bureau of Land Management Air Resource Management Strategy 2020 Monitoring Report* (BLM 2020b) describes GHG emissions from oil and gas wells. No APDs have been approved for the PFO planning area. As a result, there are no foreseeable short-term GHG emissions anticipated from oil and gas development. Future long-term GHG emissions estimates from oil and gas wells in Utah are estimated in the report. Total annual emissions in the PFO planning area are estimated to range from 3,051,780 to 3,470,352 MT CO_2e/year. The 2020 to 2050 aggregate emissions are estimated to range from 94.605 to 107.581 MMT CO2e.

Short-term foreseeable GHG emissions from oil and gas wells in Utah are estimated from approved APDs that have not been drilled to completion. However, not all APDs are drilled, and not all wells that are drilled go into production. Over a 5-year period (2015–2019), only 50% of statewide APDs were drilled, and 92% of the wells drilled went into production. For the same 5-year period, there has also been an average of 183 wells per year that were plugged. Using this information, it is assumed that of the current 267 approved APDs, approximately 135 wells will be drilled with 123 of them going into production. Factoring in the wells plugged each year results in a net decrease of 60 operating wells. Multiplying these numbers with statewide single well emissions factors results in construction emissions of 104,625 MT CO_2e, and a statewide average decrease in operation and combustion emissions of 27,178 MT CO_2e/year and 322,015 MT CO_2e/year, respectively (BLM 2020b).

The Lifting the Pause on the Issuance of New Federal Coal Leases for Thermal (Steam) Coal EA (Lifting the Pause EA) (BLM 2019) analyzes the potential effects on GHG emissions from the mining and combustion of federal coal that was applied for or authorized between January 2016 and April 2019. The Lifting the Pause EA estimates that the cumulative GHG emissions from combustion of federal coal that has been applied for or authorized would be approximately 6,903.6 MMT of CO_2e (20-year GWP) and 6,859.2 MMT of CO_2e (100-year GWP). This estimate includes coal tonnages from the proposed Lila Canyon Mine LMAs, the Williams Draw LBA, and the Walker Flat LBA. Total expected emissions resulting from the combustion of coal extracted from the approximately 1,280-acre SITLA lease areas are not included in the Lifting the Pause EA and have not yet been calculated as the coal is a mix of private, state, and federal minerals.

The IPCC's AR5 includes a summary of data from 30 different global climate models that evaluate the natural systems and feedback mechanisms contributing to climate variability (IPCC 2014). A range of global GHG emissions scenarios known as representative concentration pathways (RCP) were considered in the modeling analysis to assess potential degrees of climate change impacts. A stringent mitigation scenario (RCP2.6), a low emissions scenario (RCP4.5), an intermediate emissions scenario (RCP 6.0), and an aggressive emissions scenario (RCP8.5) are evaluated in the report. These scenarios correspond to atmospheric concentrations of CO_2 by the year 2100 of 421 ppm for RCP2.6, 538 ppm for RCP4.5, 670 ppm for RCP6.0, and 936 ppm for RCP8.5. The range of likely change in global surface temperature by 2050 ranges from 0.3 to 1 degree Celsius for the RCP2.6 scenario and from 0.5 to 2.0 degrees Celsius for the RCP8.5 scenario. Generally, the more stringent climate change mitigation, the lower the projected change in global surface temperatures. When discussing regional impacts, however, it is important to note that degrees of surface temperature increases vary from region to region. To discuss the cumulative impacts of GHG emissions for the project area, regional-scale projected impacts are discussed for the state of Utah.

The U.S. Geological Survey (USGS) has produced GHG estimates from the extraction, mid-stream (processing, transportation and distribution) and end-use combustion of fossil fuels produced on federal lands in the United States over a 10-year period (2005–2014) (Merrill et al. 2018). In 2014, nationwide gross GHG emissions from fossil fuels extracted from federal lands were 1,332.1 MMT CO_2e. Emissions from fossil fuels produced on federal lands represent, on average, 23.7% of national emissions for CO_2, 7.3% for CH_4, and 1.5% for N_2O over the 10 years included in this estimate (Merrill et al. 2018). Trends and relative magnitude of emissions are roughly parallel to production volumes. Regional and national coal and natural gas production trends and emissions and projected emissions are shown in Appendix D.

GHG emissions in the United States in 2017 totaled 6,456.7 MMT CO_2e (EPA 2019a). GHG emissions in the state of Utah in 2018 totaled 35.1 MMT CO_2e (EPA 2018). GHG emissions in Emery County in 2018 totaled 13.5 MMT CO_2e (EPA 2018). Because all the reasonably foreseeable future actions that involve coal mining are existing mining operations for which the future actions would extend production rather than increase production, the average annual GHG emissions from these mines are captured in these totals. The 34.3 MMT of direct and indirect CO_2e emissions from the coal mined from the proposed LMA areas over approximately 3 years (see Table 3-13) would contribute to statewide, regional, and national GHG emissions totals. Over that 3-year period, 34.3 MMT of CO_2e would average 11.4 MMT of CO_2e per year, representing approximately 0.2% of the total 2017 GHG emissions in the United States. The Proposed Action-direct CO_{2e} GHG emissions (see Table 3-12) are approximately 1.2% of Emery County's 2018 GHG emissions and 0.5% of statewide GHG emissions. It is important to note, the indirect CO_{2e} GHG emissions such as those from coal combustion at Hunter and Huntington Power Plants are already accounted for in the existing county, state and national emission inventories. The Proposal Action is a lease modification that would extend mining activities currently allowed, but would not authorize a change in the already permitted actions for the maximum production of coal. As a result, the BLM provides an estimate of potential GHG emissions by assuming that all produced products would eventually be combusted. GHGs, regardless of the source, contribute incrementally to climate change.

The BLM prepared the Colorado Plateau Rapid Ecological Assessment (CPREA) to provide regional scale information and assessment analysis on current and future conditions for the Colorado Plateau. This modeling analysis includes an assessment of potential climate change impacts (BLM 2012). In general, this modeling predicts future average annual temperature increases. Average annual precipitation is generally predicted to decrease (drier) through 2030 and increase (wetter) through 2060.

The USGS National Climate Change Viewer (USGS 2019) can be used to evaluate potential climate change at the state level. The viewer provides data showing projections of future climate trends under RCP emission scenarios RCP4.5 and RCP8.5. Data presented in the USGS Climate Change Viewer data can also be extrapolated to get a general understanding of impacts under RCP2.6 and RCP6.0. Generally, the RCP2.6 scenario can be assumed to contribute to a lesser degree of climate change impacts in the region, while the RCP6.0 can be assumed to contribute to impacts that are of lesser magnitude than RCP8.5 but of greater magnitude than RCP4.5. The USGS National Climate Change Viewer (USGS 2019) can be used to evaluate potential climate change at the state and county level. Projected changes to maximum and minimum temperatures in Utah resulting under a moderate GHG emissions scenario show both the maximum and minimum temperatures leveling off at approximately 5°F warmer than historical temperatures by the year 2100, while an aggressive GHG emissions scenario (RCP8.5) shows an increasing trend (approximately 5°F higher than the RCP4.5 scenario) at year 2100 (USGS 2019). The RCP4.5 and RCP8.5 scenarios forecast similar levels of climate impacts in the region over the next few decades; however, impacts over the next century diverge significantly. Because of uncertainties in the climate models, especially toward the end of the century, the impacts projected represent a forecast but are not certain to occur at the magnitudes projected. It is important to note that the high-end nature of the RCP8.5 scenario assumes a baseline without any future climate policy rather than the most likely "business as usual" outcome. Therefore, RCP8.5 could be considered unlikely to happen, while RCP4.5 and RCP6.0 would be more likely the representative scenarios.

3.3 Socioeconomics

The analysis area for potential direct, indirect, and cumulative socioeconomics effects comprises Emery County and communities within Emery and Carbon Counties that are located near the Lila Canyon Mine (i.e., East Carbon, Sunnyside, Price, Wellington, and Green River). This analysis area was chosen because it is the area where potential effects from employment, taxes, and revenue resulting from the development of the proposed lease modification areas would occur. This includes direct employment and income from mining jobs; indirect employment and income from coal transportation; the purchasing of mining equipment, fuel, and other vendor services and products; and royalties and tax revenues from coal production and sales.

3.3.1 Affected Environment

3.3.1.1 Employment

In 2017, total employment in Emery County was approximately 3,052 jobs (Utah Department of Workforce Services [UDWS] 2018). Trade, transportation, and utilities was the largest employment sector of Emery County, representing approximately 941 jobs (UDWS 2018). The second- and third-largest employment sectors in the county were government (approximately 884 jobs) and construction (approximately 299 jobs). Mining accounted for approximately 224 jobs in Emery County in 2017, or approximately 7% of total employment (UDWS 2018).

According to UDWS, the average monthly wage in Emery County in the mining sector was $6,446 in 2017 (UDWS 2018). The average monthly wage for all employment sectors in the county was $3,594 in 2017.

In 2017, total employment in Carbon County was approximately 8,414 jobs (UDWS 2018). Government was the largest employment sector of Carbon County, representing approximately 2,158 jobs (UDWS 2018). The second- and third-largest employment sectors in the county were trade, transportation, and utilities (approximately 1,793 jobs), and education and health services (approximately 1,321 jobs). Mining accounted for approximately 612 jobs in Carbon County in 2017, or approximately 7% of total employment (UDWS 2018).

According to UDWS, the average monthly wage in Carbon County in the mining sector was $7,875 in 2017 (UDWS 2018). The average monthly wage for all employment sectors in the county was $3,211 in 2017.

3.3.1.2 Taxes and Revenues

Fiscal effects from mining industry activities come in the form of various taxes and revenues paid by mining companies and the federal government to state and local governments where coal production occurs. Income taxes from coal mining wages are one of these fiscal effects because income taxes from jobs in the mining sector are collected by and paid to counties.

In addition to fiscal effects from taxing income, state and local governments receive other types of taxes, royalties, and funds as a result of mining activities in Emery County, such as:

- Property taxes paid on coal mines in Emery County.
- Property taxes paid on coal-fired power plants in Emery County (Hunter Plant and Huntington Plant).
- Rents and royalties paid for coal production on SITLA lands in Emery County.
- Federal coal royalty payments and disbursements to the State of Utah.

There are currently four active coal mines in Emery County. These mines and their recent production rates are listed in Table 3-19. Lila Canyon Mine reported 2,815,678 tons of coal production in 2018 (UEI 2019b) and 3,663,970 tons of coal in 2019 (DOGM 2020).

Table 3-19. Emery County Coal Mine Production (tons)

Mine	2013	2014	2015	2016	2017*
Emery II	4,000	–	–	–	129,000
Castle Valley #3	–	–	218,000	170,000	175,000
Castle Valley #4	875,000	1,061,000	757,000	724,000	783,000
Lila Canyon	257,000	335,000	350,000	1,587,000	1,629,000

Source: Boden et al. (2018).
* Preliminary

According to the ONRR, 2,671,777 tons of coal were produced from federal lands in Emery County in 2017 (ONRR 2019). The Department of the Interior applies an 8% royalty rate to coal extracted from underground mines on federal lands. Federal revenues from coal mining on federal lands in Emery County amounted to approximately $6.2 million in 2017 (ONRR 2018a, 2018b). Half of the revenue collected from royalties is disbursed back to the state of Utah, and half of the revenue disbursed to the state is typically disbursed to the county where the coal was extracted.

3.3.2 Environmental Impacts – Alternative A: No Action

Under the No Action Alternative, the BLM would not approve the proposed lease modifications and there would be no extraction of recoverable coal in the proposed lease modification areas. Therefore, there would be no direct or indirect impacts to the social and economic conditions of the analysis area. The local population, employment, housing conditions, and revenue would remain similar to current conditions because mining would continue in other areas of the Lila Canyon Mine. However, changes in other local industries could impact the socioeconomics of the analysis area. The extension of mining operations at the Lila Canyon Mine for an additional 2 to 3 years and associated employment and economic impacts would not occur under the No Action Alternative.

3.3.2.1 Cumulative Effects

Under the No Action Alternative, the BLM would not approve the proposed lease modifications. The current rates of employment, taxes, and revenue at the Lila Canyon Mine would continue under the No Action Alternative, but there would be no cumulative effect on socioeconomics in the analysis area from the approximately 3-year extension in the life of the Mine that would result from the Proposed Action, if it had been approved.

3.3.3 Environmental Impacts – Alternative B: Proposed Action

3.3.3.1 Employment

Under the Proposed Action, coal production and employment levels at the Lila Canyon Mine would not increase but would be extended for an additional 2 to 3 years. As of early 2020, the

Lila Canyon Mine employs 238 people. This approximate level of employment would be expected to continue during the additional 3-year time period. The continuation of direct employment effects would be minor over the extended life of the Mine because it would represent an estimated 2% of total employment in Emery and Carbon Counties.

The Proposed Action would also provide for secondary mining support jobs for an additional 2 to 3 years. Based upon 2017 Utah coal mining employment numbers, for every direct coal mining job in Utah, there are approximately 2.3 indirect/induced jobs (National Mining Association 2018). This translates to approximately 547 indirect jobs in place for the additional 3-year period of mine operation. Other indirect effects to the local economy would continue through the purchase and use of goods and services needed for mine operations, vehicles, and employees. The continuation of indirect employment effects would be minor over the extended life of the Lila Canyon Mine because it would represent an estimated 4% of total employment in Emery and Carbon Counties.

Under the Proposed Action, the mining sector's share of the workforce in Emery and Carbon Counties would not change. However, geographies with economies that focus narrowly on resource extraction, particularly on fossil-fuel development, can be subject to boom-and-bust cycles, as well as other economic challenges, such as slower long-term economic growth. Because of changes in external market pressures, natural resource economies are often vulnerable to unpredictable cycles of economic growth and recession. This can present challenges to communities in the form of fluctuating tax bases, demands for public infrastructure and social services, employment numbers, housing prices, and migration of workers into and out of a particular area.

3.3.3.2 Taxes and Revenues

Taxes and royalty payments from the mining of coal in the proposed lease modification areas would provide direct revenue to the state of Utah and federal government at approximately the same rate that currently occurs because the Proposed Action is a continuation of mining. However, the Proposed Action would add approximately 2 to 3 years to the life of the Lila Canyon Mine, which would extend the amount of time revenue is provided to the state and federal government.

In 2017, the average sales price for Utah coal was $35.28 per ton (U.S. Energy Information Administration 2019). Assuming the coal mined from the proposed lease modification areas area would be priced similarly, the 7.2 million tons of total coal produced from the proposed modification areas would result in approximately $254 million in total revenue. At a royalty rate of 8% for coal removed from an underground mine (Federal Coal Lease stipulations and 25 CFR 211.43), this would result in approximately $20.3 million in total federal royalty revenues, approximately $10.2 million in total state revenue from royalty disbursement, and approximately $5.1 million in total Emery County revenue from royalty disbursement. This Emery County disbursement is generally used for community impacts funds resulting from coal mining activities. The disbursement is commonly used for road maintenance, utility maintenance, and so forth. The approximately $5.1 million in total royalty disbursement to Emery County would result in an approximately $1.7 million in royalty disbursement to the county each year if we assume there would be 3 years of coal mining from the proposed lease modification areas.

3.3.3.3 Cumulative Effects

The Proposed Action would increase the life of the Lila Canyon Mine but would not affect employment levels at the Mine. The cumulative effects on demographics and housing in the socioeconomics analysis area would result from a 2 to 3-year extension of employment. The Proposed Action would incrementally add to the revenue and royalties of other active coal mines in the analysis area, including Emery II, Castle Valley #3, and Castle Valley #4. As shown in Table 3-19, total annual coal production at these three mines was approximately 1.1 million tons in 2017. Assuming these three mines were to produce at a similar rate over the 2 to 3 years during which coal would be mined from the proposed lease modification areas, these three mines would produce approximately 2.2 million tons to 3.3 million tons of coal during those 2 to 3 years. Combined with the 7.2 million tons produced from the proposed lease modification areas over those 2 to 3 years, this would be approximately 9.4 to 10.5 million tons. If we assume production occurs over 3 years and the price is $35.28 per ton, the total production from these four mines over 3 years would sell for approximately $370.4 million. The royalties paid to the federal government at an 8% royalty rate would be approximately $29.6 million over those 3 years, or approximately $9.9 million per year. The state would receive approximately $5.0 million per year from these royalties, half of which (approximately $2.5 million) would go to Emery County.

Other actions that, if approved, could contribute cumulatively to the employment and revenues in the analysis area include the Chalk Hills Mine Expansion, approved oil and gas APDs subsequent to the BLM's quarterly oil and gas lease sales, IACX Woodside Dome 1 APD, Twin Bridges Bowknot Helium project, EnerVest Peters Point APDs, E. Carbon Junction Fiber project, and the Uinta Basin Railway (see Appendix C).

3.4 Water Resources

3.4.1 Affected Environment

The analysis area for examining potential direct, indirect, and cumulative impacts to water resources is the analysis area for the Cumulative Hydrologic Impact Assessment (CHIA) for the Lila Canyon Mine (DOGM 2007). This analysis area was chosen because the hydrogeology and hydrology of the areas surrounding the proposed lease modification areas has been studied extensively as part of investigations related to mine permitting activities over the years (BLM 2000; Cirrus and Petersen 2017; DOGM 2007, 2010). The proposed lease modification areas lie within the area analyzed in the Lila Canyon MRP and the CHIA for the Lila Canyon Mine (DOGM 2007). The area analyzed in the Final Hydrology Assessment for Williams Draw Coal Tract (Cirrus and Petersen 2017) is within the cumulative impact area (CIA) defined in the CHIA and adjacent to the proposed lease modification areas. According to the CHIA, "the CIA is a designated area surrounding mining activity within which past, present, and anticipated or foreseeable coal mining activities may interact to affect the surface and groundwater" (DOGM 2007). The CIA of the CHIA is approximately 73,000 acres and extends from the Patmos Ridge on the east side to the Price River on the west side. Water resources in these areas are evaluated by use and interpretation of existing field monitoring data and reports. The analysis of effects includes the potential of 1) the direct interception of groundwater resources through mine dewatering, and 2) the alteration of groundwater recharge areas, flowpath areas, or discharge areas as a result of mining-induced fracturing from sub-surface subsidence.

Surface water resources in the proposed lease modification areas include ephemeral streams and two springs. There are no perennial streams in these areas. The closest perennial stream is Range Creek, located outside of the CIA identified in the CHIA, and beyond the Patmos Ridge to the east of the proposed lease modification areas. The Patmos Ridge defines the eastern boundary of the CIA evaluated in the CHIA. Groundwater resources in the proposed lease modification areas include active-zone and inactive-zone groundwater systems.

3.4.1.1 Groundwater

Groundwater in the proposed lease modification areas is extremely limited due to low precipitation and low recharge rates; it exists in two different geologic formations: the upper zone, Wasatch Group, and the lower zone, Mesaverde Group. The Wasatch Group consists of the North Horn—Flagstaff, and Colton Formations and extends throughout the eastern portion of the Lila Canyon Mine area (DOGM 2007). Some saturated zones of the North Horn Formation of the Wasatch Group are considered to be true aquifers using the definition as stated in Utah Administrative Code (UAC) R645-100 (as in effect February 1, 2019) where an aquifer "means a zone, stratum, or group of strata that can store and transmit water in sufficient quantities for a specific use" (UAC 645-100 2019). Groundwater in the Wasatch Group is an active-zone groundwater system because shallow-depth rock units are connected to a recharge area, the soils have sufficient capacity to store water and discharge it to springs, and groundwater migration to deeper inactive systems is mostly prevented by the presence of impermeable rock formations such as clay layers (DOGM 2007).

Groundwater in the Blackhawk Formation of the Mesaverde Group does not reside in a true aquifer using the above definition because "although a considerable volume of water may be stored, the water is not developed for a specific use, the strata do not transmit ground water to supply any water sources, and the water has no potential to be used or developed nor is it elemental to preserving the hydrologic balance in the permit and adjacent areas" (DOGM 2007). Further, the groundwater system is described as being inactive because it does not respond to seasonal and climatological variability. There is minimal interaction between groundwater in the Wasatch Group and Mesaverde Group as they are generally lenticular and perched or separated by impermeable clay layers. There are no groundwater discharge points from the Mesaverde Group anywhere in the CIA of the CHIA (DOGM 2007). A geologic section is shown in Figure 3-3.

Because the Blackhawk Formation is confined by low permeability shales and siltstones, where groundwater exists, groundwater movement is more likely to be horizontal rather than vertical. Horizontal flow in the deep, inactive-zone groundwater system, if it exists at all, is from higher elevation areas of the West Tavaputs Plateau and Range Creek toward lower elevations (DOGM 2007). Groundwater flow direction (perpendicular to the equipotential lines of hydraulic head) is to the northeast, which approximates the bedrock dip in the area (Cirrus and Petersen 2017).

Groundwater in the North Horn Formation of the Wasatch Group, the active-zone system, is primarily recharged by precipitation in the form of snowmelt, and discharges from springs at the surface. According to the CHIA, groundwater recharge in the Book Cliffs region has been estimated to be between 3% to 8% (Danielson and Sylla 1983) and 9% (Waddell et al. 1986) of the average annual precipitation. Recharge from precipitation is variable as the groundwater recharge rate is also influenced by timing and rate of precipitation, as well as soil type. Groundwater flow in the Wasatch Group is influenced by gravity and local geologic features such as bedrock fractures. In general, groundwater flows from areas of recharge toward areas of discharge.

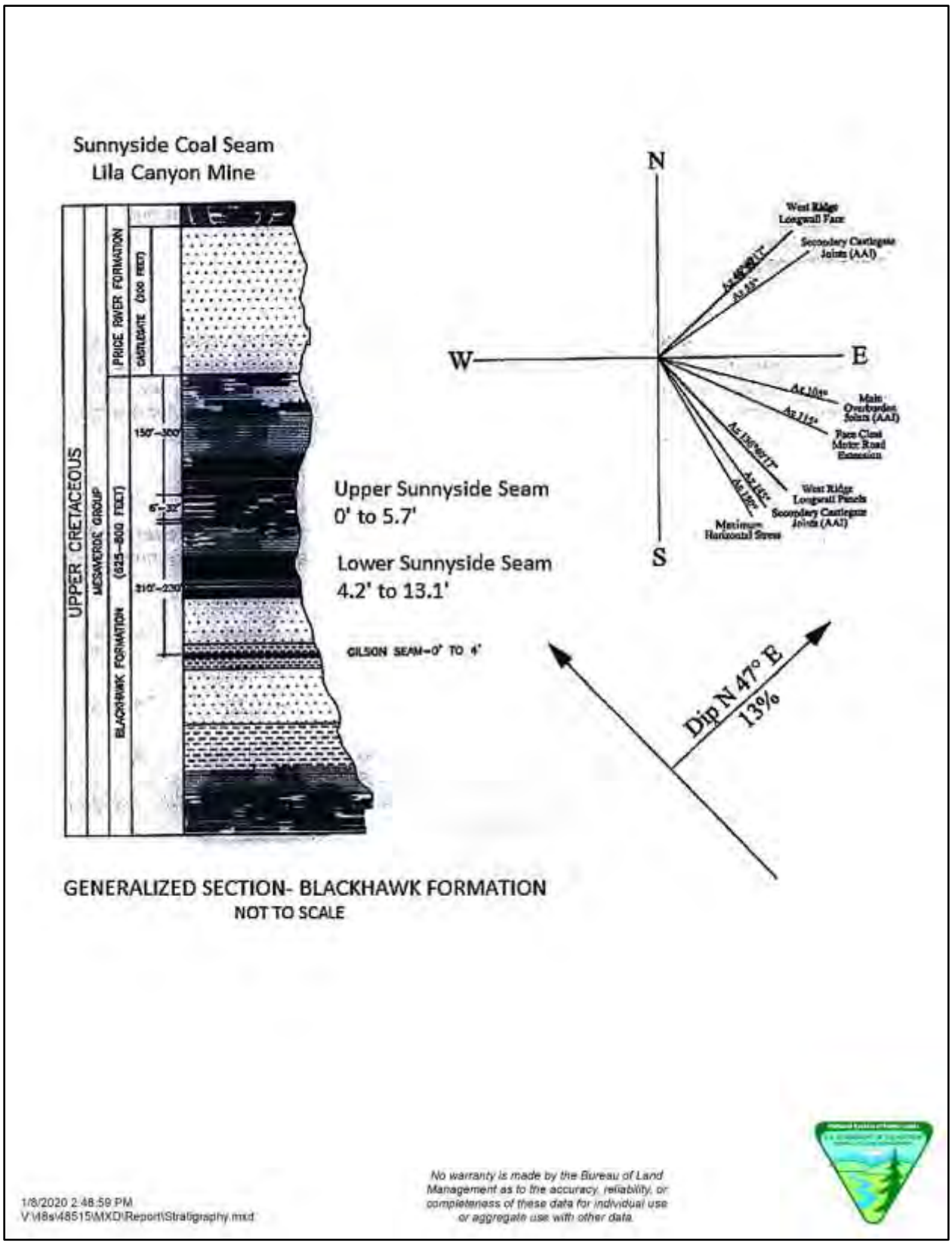


Figure 3-3. General geologic section.

Groundwater quality in the Wasatch Group can be measured by analysis of water samples collected from springs that discharge at the surface or by drilling wells. UEI has sampled several water monitoring stations on a quarterly basis since 2007, per conditions of the C/007/0013 Lila Canyon Mine permit approval. That information is reported electronically to the DOGM and summarized in reports to the DOGM permit supervisor.

Groundwater quality varies greatly in the Book Cliffs region and is mostly dependent on geologic formation and elevation. Total dissolved solids (TDS) is a measure of the total amount of dissolved constituents in water and is a commonly used indicator of groundwater quality. TDS concentrations in shallow groundwater in the Book Cliffs region range from 250 milligrams per liter (mg/L) to 2,000 mg/L and are driven by the type and amount of soluble minerals in the geologic formation (DOGM 2007). In addition, groundwater quality is typically better near areas of mountain recharge and diminished in lowland areas (DOGM 2007).

Three piezometers (IPA-1, IPA-2, and IPA-3), devices used to monitor the pressure or depth of groundwater, were installed in the Lila Canyon Mine DOGM permit area in the 1990s to monitor groundwater levels in the Blackhawk Formation of deep groundwater zone. Groundwater level data from the piezometers between 1994 and 2016 are summarized in the Final Hydrology Assessment (Cirrus and Petersen 2017). IPA-2 and IPA-3 are located in the same fault block. Water levels in the monitoring wells are monitored quarterly according to DOGM permit requirements. Water levels in these three wells remained relatively stable over more than two decades of monitoring—from installation in 1994 until approximately 2015 (Cirrus and Petersen 2017). Monitoring well IPA-3 was destroyed as a result of mining activities; it was sealed in October 2017. Water levels in the remaining two wells have generally decreased since 2015 (Figure 3-4).

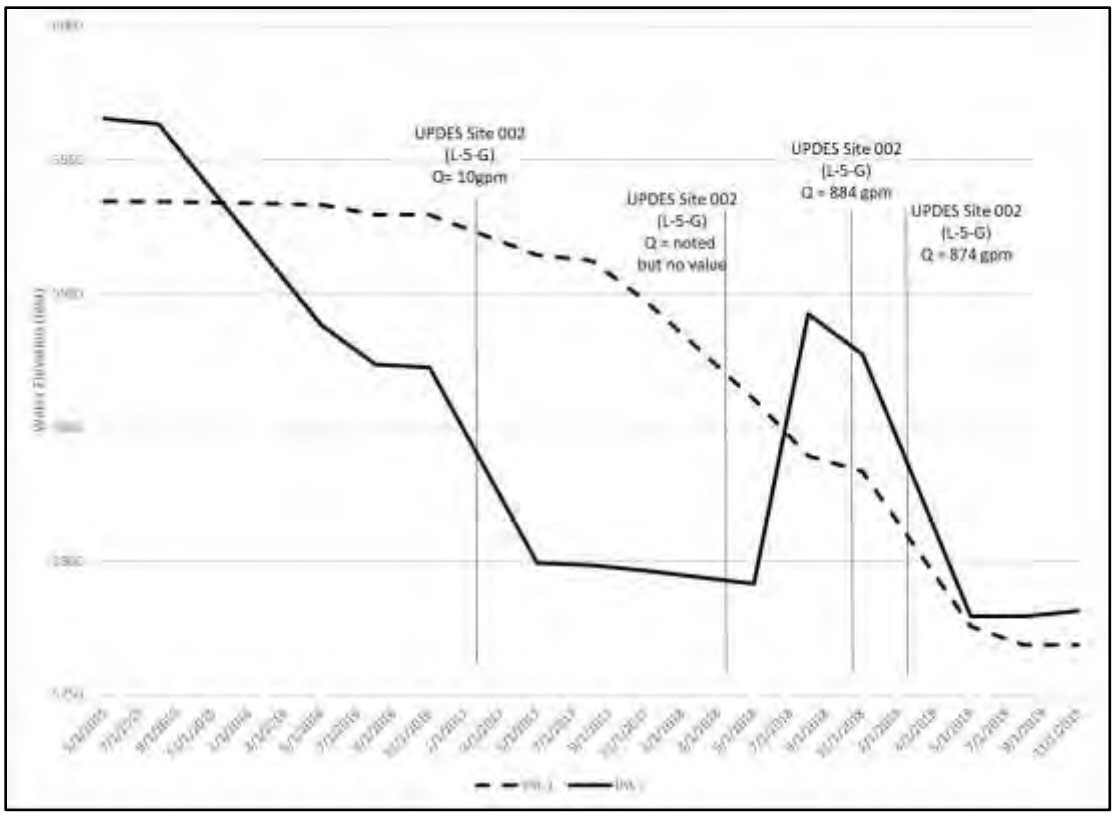


Figure 3-4. Hydrographs for monitoring wells IPA-1 and IPA-2 for the period Q2 2015 to Q4 2019 shown with discharge data from DOGM database.
Discharge data source: DOGM (2020).

IPA-1 is located in a different fault block than IPA-2 and IPA-3. DOGM noted in 2007 that water levels had risen continually at this location during the period of record (DOGM 2007). The rise in water level at IPA-1 is not understood, although the potential explanations offered by DOGM in 2007 (a leaking annular seal allowing surface water to reach the monitored zone, a bore-hole that had not yet reached equilibrium, and a Horse Canyon Mine exploration tunnel) were not related to mining activity (DOGM 2007).

Water levels lowered steadily in IPA-1 from the winter of 2016–2017 until the spring of 2019, compared with a more rapid decrease in IPA-2 from the summer of 2015 through the spring of 2017. IPA-2 then recorded a short-lived recharge that again rapidly depleted. Water levels in both wells appear to have leveled off at a water elevation of approximately 5,775 feet during the summer and fall of 2019.

The two wells (IPA-1 and IPA-2) are showing different responses to the mining activity as shown in Figure 3-4. IPA-1 is approximately 1.5 mile to the northeast of the IPA-2 and the two wells are separated by a fault (DOGM 2007), with screened intervals separated by approximately 600 feet in elevation differences. The screened intervals are the segments of the well equipped with filtering devices to allow intake of groundwater while keeping sand and gravel out of the well. IPA-1 is screened from 1,700 to 1,730 feet and IPA-2 from 1,101 to 1,116 feet below ground surface (Cirrus and Petersen 2017).

The monitoring wells are screened within the deeper aquifer described as an Inactive Groundwater Flow System by Mayo et al. (2003). Groundwater in this aquifer is characterized as old (2,000 to 20,000 years) with a general lack of hydraulic communication with the ground surface and active recharge zones (Cirrus and Petersen 2017). The system's general lack of communication, both vertically and horizontally, has been attributed to:

- an abundance of low-permeability rocks in the sequence;
- faults and fractures in the system that can provide for the movement of water in this system can be sealed by swelling clays (DOGM 2007); and
- the lenticular, discontinuous nature of the interbedded, more permeable, horizons that limit the extent of potential groundwater movement.

Generally, during the advancement of longwall mining in the region, little groundwater is encountered. Both roof and floor inflows are generally from sandstone channels within the supporting units, with occasional substantial inflows from fault-related drainage zones (Mayo et al. 2003). Longer-term mine inflows show a rapid decline in flow rates and ultimate extinction. Dewatering and subsidence related to mining have the greatest potential for impacting groundwater resources (DOGM 2007). Underground mining removes the support to overlying strata, and the subsequent fracturing and subsidence-induced caving can create conduits that allow groundwater to enter the mine.

Review of water quality memos from the DOGM database indicates that there was an initial low discharge recorded in the first quarter 2017 around the time of the initial lowering of water levels (see Figure 3-4). A period of greater discharge (approximately 880 gallons per minute [gpm]) was recorded in the fourth quarter 2018 to first quarter 2019, corresponding to what appears to be the final lowering of the potentiometric surface.

The two wells are showing different responses to the mining activity. IPA-1 is located approximately 1 mile north of IPA-2, and the two wells are separated by a fault (DOGM 2007). Although the mine plan has not been reviewed, it is inferred that IPA-2 is closer to the mine operations, as the third monitoring well, IPA-3, is located approximately 1 mile farther to the southeast of IPA-2. In addition to the potential difference in lithologies described above, its closer proximity to mine operations may explain the more rapid lowering of the potentiometric surface in IPA-2. Additionally, different responses to subsidence within the mine may also produce differing hydrographs.

Under Rule R645-301-751 of Utah Administrative Code, water that is discharged from a coal mine must meet applicable water quality standards. Any groundwater that exceeds the amount needed for mining operations would be stored, treated, then discharged in compliance with UPDES Permit No. UTG040024: General Permit for Coal Mining, which has effluent limitations so that discharged water will meet applicable state water quality standards (Utah Division of Water Quality [UDWQ] 2013). Permit limitations would not change under the Proposed Action. Water quality of the mine discharge is monitored on a monthly basis by UEI; results are reviewed by UEI and provided to UDWQ. The UPDES permit for the Lila Canyon Mine contains daily maximum concentration limitations for individual pollutants, as well as a discharge limit of 1 ton per day of TDS from all discharge points combined.

The Lila Canyon Mine UPDES permit identifies two discharges: 001 is discharge from the sediment pond and 002 is discharge from the underground mine. These discharges are being

monitored as sites L-4-S and L-5-G, respectively. The UPDES permit specifies monitoring frequency and required parameters. UPDES site 002 (L-5-G) discharged an average of 894 gpm during 4th quarter of 2019 (DOGM 2020).

An additional discharge point has been proposed under UEI's draft UPDES Permit No. UT0026018 (UDEQ 2020). Underground mining operations in the Lila Canyon Mine are expected to intersect and cross an old portion of the historical Horse Canyon workings. These old workings are flooded and are expected to be drained over a period of time in order to allow safe access to the area of intersection of the new and old workings.

3.4.1.2 Surface Water

The proposed lease modification areas are in the Little Park Wash subwatershed (Hydrologic Unit Code [HUC] 140600071107), which is part of the larger Price River watershed. The proposed lease modification areas lie to the east of the Little Park Wash and contain several tributary drainages that carry ephemeral surface flows from the Patmos Ridge toward the Little Park Wash (Figure 3-5). Little Park Wash is the largest surface water feature in the vicinity and is an ephemeral stream channel that runs for approximately 14 miles before joining with Trail Canyon. Trail Canyon is connected to the Price River by a dry wash. The Price River ultimately joins the Green River about 19 miles south of Trail Canyon (Cirrus and Petersen 2017).

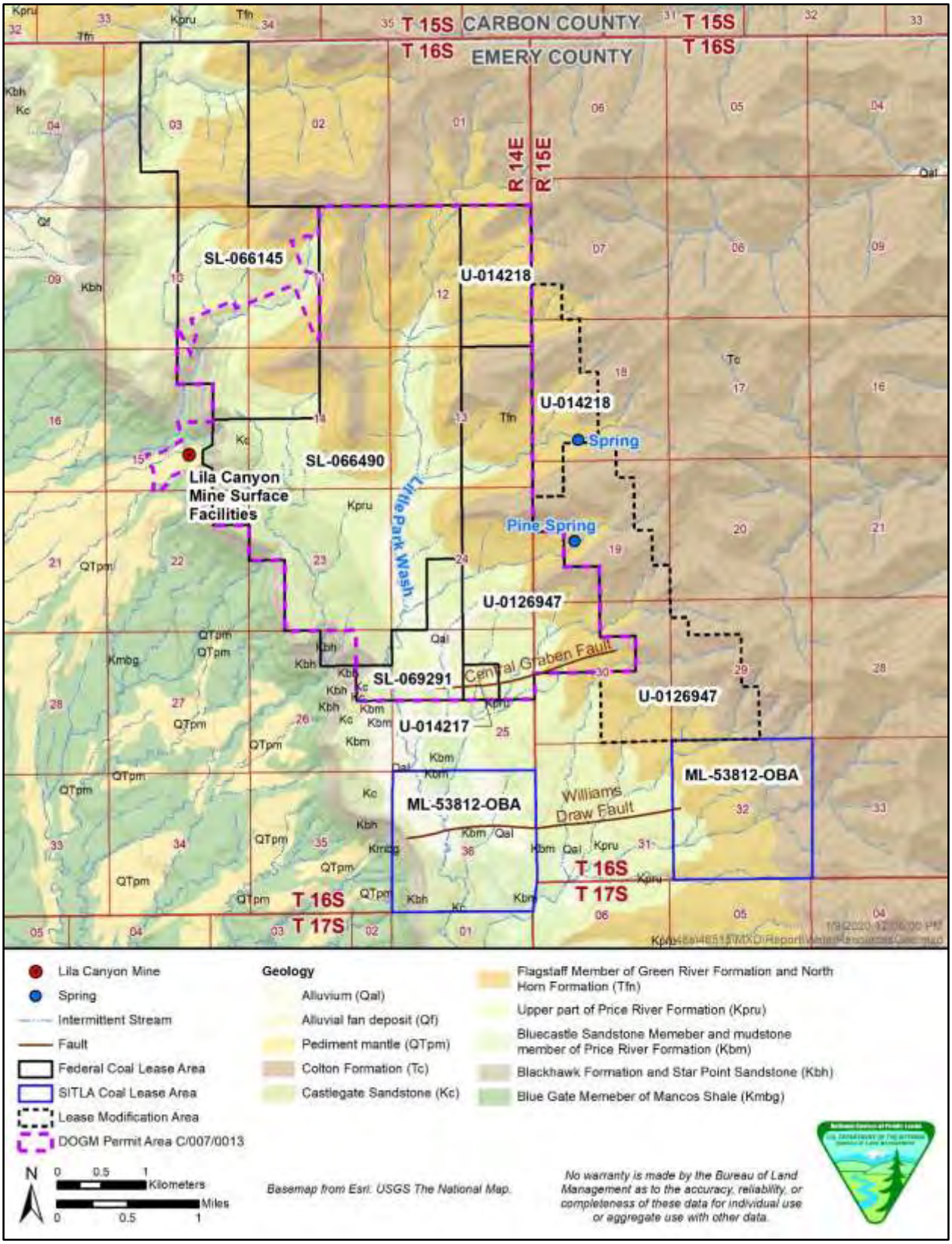


Figure 3-5. Geology and water resources.

Tributary channels in the proposed lease modification areas are mostly narrow, incised channels with coarse substrate. The tributary drainages enter the proposed lease modification areas at about 6,800 to 7,100 feet and enter the Little Park Wash at about 6,200 to 6,400 feet with a slope that ranges from 2% to 10%. The tributary channels are "generally narrow, somewhat incised, with relatively coarse substrate or bedrock" (Cirrus and Petersen 2017).

Surface flows in the tributary drainages are driven by precipitation events and seasonal runoff, which is typical of other arid watersheds in the Book Cliffs region. Field monitoring data collected from 2016 to 2017 indicates that "rain events have a greater influence on surface hydrology in comparison to snowmelt runoff" (Cirrus and Petersen 2017). Surface flows in the tributary drainages from low precipitation events rapidly infiltrate channel substrate and are unlikely to reach Little Park Wash (Cirrus and Petersen 2017). Flow data to characterize the amount of surface flow from tributary drainages in the proposed lease modification areas are not available.

According to the CHIA for the Lila Canyon Mine, "some of the draws that supply these stream channels contain springs, which flow perennially for short distances then filter into the channel deposits. All the springs on the CIA flow less than 10 gpm [gallons per minute] and most flow only one or two gpm" (DOGM 2007). Springs that discharge from the active-zone groundwater system in the North Horn Formation are generally located in existing stream channels. As indicated above, surface flow from springs only travels for a short distance in the stream channels before infiltrating into the ground. In general, springs discharging from the North Horn Formation are active in the spring and early summer and are dry for the remainder of the year (Cirrus and Petersen 2017).

Beneficial uses for surface waters of the state are assigned by the UDWQ for each assessment unit in Utah. Assessment units are discrete sub-watershed units delineated by UDWQ. The proposed lease modification areas lie within the Grassy Trail Creek Lower assessment unit, which includes Grassy Trail Creek and tributaries from the Price River confluence to Grassy Trail Creek Reservoir. UDWQ has classified surface waters in this assessment unit with the following designated beneficial uses (UDEQ 2019):

- Class 2B: Protected for infrequent primary contact recreation
- Class 3C: Protected for nongame fish and other aquatic life
- Class 4: Agricultural uses

Water quality criteria consist of numeric thresholds for individual pollutants and narrative descriptions of desired conditions. Numeric criteria for individual pollutants are found in UAC R317-2 (Standards of Quality for Waters of the State). Numeric criteria for established beneficial uses as described in UAC R317-2 serve as a baseline for understanding results of water quality monitoring. The following narrative criteria applies to surface waters in the proposed lease modification areas:

> It shall be unlawful, and a violation of these rules, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life,

> or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3 (UAC R317-2 2019).

Waters protected for infrequent primary contact recreation (beneficial use Class 2) and aquatic-life uses (Class 3) do not have a TDS numeric criterion. The numeric criterion for agricultural uses (Class 4) is typically 1,200 mg/L; however, UDWQ has developed a site-specific TDS standard of 3,000 mg/L for the Price River and tributaries from the confluence with the Green River to the confluence with Soldier Creek.

There are two springs in the proposed lease modification areas: L-8-G and L-9-G (Pine Spring) (see Figure 3-5). The water rights associated with springs L-8-G and L-9-G are 91-2538 and 91-2539 respectively (DOGM 2010). The water right associated with L-8-G is used for stock watering and is owned by the State of Utah (DOGM 2010). The water right for L-9-G is owned by the BLM (Utah Division of Water Rights 2019). According to the CHIA, L-9-G has been used for cattle and wildlife in the past, although the metal spring box has been washed downstream (DOGM 2007).

Water samples have been collected from the two springs in the proposed lease modification areas since the 1990s. The first sampling efforts were conducted in the early 1990s to establish baseline conditions. UEI has collected samples from the two springs in the proposed lease modification areas (which discharge from the North Horn Formation) on a quarterly basis since 2007 per conditions of the C/007/0013 Lila Canyon Mine permit. Results are reported to DOGM. Water quality data for the two springs was not readily available prior to 2015. TDS concentrations measured at spring L-8-G between 2015 and 2018 range between 376 mg/L and 648 mg/L with an average concentration of 540.8 mg/L (UEI 2019c). TDS concentrations measured at spring L-9-G since 2015 range between 629 mg/L and 901 mg/L with an average concentration of 750 mg/L. Spring L-9-G does not flow year-round according to discharge data received from UEI (UEI 2019c). Other water quality parameters monitored by UEI at springs L-8-G and L-9-G, including alkalinity, hardness, cations, and chloride, do not have State of Utah numeric criteria.

Discharge at springs L-8-G and L-9-G was measured at the same time as the water quality samples. The average discharge at spring L-8-G between 2015 and 2018 was 0.436 gpm, or 0.0009 cubic feet per second (cfs). Average discharge at spring L-9-G during the same time period was 0.886 gpm, or 0.001 cfs.

There is no evidence to suggest that the springs in the proposed lease modification areas have impaired water quality with regard to State of Utah numeric criteria for designated beneficial uses. UDWQ assessed water quality data collected within the Grassy Trail Creek Lower assessment unit (UT14060007-012) in the most recent Integrated Report and determined there was insufficient data to make an assessment determination for the assessment unit (UDWQ 2016). Springs L-8-G and L-9-G were not assessed by UDWQ.

Water quality of springs that discharge from the North Horn Formation in the nearby Williams Draw Coal Tract is assumed to be similar to water quality of springs that discharge from the North Horn Formation in the proposed lease modification areas. Water samples were collected on a quarterly basis from springs that discharge from the North Horn Formation in the Williams Draw Coal Tract as part of a comprehensive hydrological survey conducted by Cirrus from September 2016 to June 2017.

Water quality parameters measured by Cirrus and Petersen (2017) in the 2016–2017 hydrologic survey indicate that springs discharging from the North Horn Formation in the Williams Draw Coal Tract typically flow less than 1 gpm and have water quality that is supporting beneficial uses. Field measurements of dissolved oxygen, pH, and temperature were within acceptable limits as set forth in UAC R317-2, as are measurements of TDS and other water quality constituents (Cirrus and Petersen 2017). TDS values were variable and ranged from 560 mg/L to 3,706 mg/L, with an average value of 1,504 mg/L (Cirrus and Petersen 2017).

3.4.2 Environmental Impacts – Alternative A: No Action

Under the No Action Alternative, the effects of mining UEI's federal coal leases on surface water and groundwater would continue as described in approval documents for ongoing activities in the Lila Canyon Mine. There would be no direct or indirect impacts to surface water or groundwater resulting from mining of the proposed lease modification areas as the BLM would not approve modification of the existing leases. Ongoing indirect effects as a result of coal combustion, such as at the Hunter and Huntington Power Plants, are described in Appendix E.

3.4.2.1 Cumulative Effects

There would be no cumulative effects to water resources under the No Action Alternative, as the existing coal leases would not be modified to include the proposed lease modification areas.

3.4.3 Environmental Impacts – Alternative B: Proposed Action

As with the discussion of water resources, existing information from investigations related to mine permitting activities is used for analysis of potential impacts to water resources from mining coal resources in the proposed lease modification areas of the Lila Canyon Mine.

Under the Proposed Action, coal in the proposed lease modification areas would be mined using the existing infrastructure from the Lila Canyon Mine, and no additional surface disturbances are expected. Under the Proposed Action, there exists the potential for 1) the direct interception of groundwater resources through mine dewatering, and 2) the alteration of groundwater recharge areas, flowpath areas, or discharge areas as a result of mining-induced fracturing from subsidence. Because of the depth of the mining operation and lack of surface disturbance, no impacts to surface water resources are expected. It should be noted, however, that DOGM (SMCRA) permits require water replacement stipulations, should any surface water be disrupted. Indirect effects as a result of coal combustion, such as at the Hunter and Huntington Power Plants, are described in Appendix E.

3.4.3.1 Groundwater

Under the Proposed Action, impacts to groundwater resources from mine dewatering are expected to be minimal because coal mining production would not increase beyond currently permitted levels. Water encountered during mining is typically stored and used within the Mine for dust suppression or for other uses; it may be stored and re-used several times prior to any discharge. As mining shifts into the proposed lease modification areas, this cycle of water use would continue. Mine dewatering is the removal and discharge of excess groundwater that has infiltrated into a mine or has been intercepted by mining processes. Because mining at the Lila Canyon Mine would occur at a depth of 2,500 to 3,000 feet below the surface, the only

groundwater likely to be encountered would exist in the deep, inactive-zone groundwater system (lenticular and perched). As discussed in Section 3.4.1.1 of this EA, DOGM concluded that groundwater in the inactive-zone groundwater system of the Blackhawk Formation of the Mesaverde Group is not hydrologically connected to the shallow recharge aquifers (DOGM 2007). Therefore, mine dewatering rates would naturally decline over time after the first encounter with groundwater (BLM 2013). However, because of the complex nature of regional faulting and groundwater flowpaths as well as uncertainty about the exact location and displacement along the primary faults (Cirrus and Petersen 2017), there may be potential for connectivity between shallow aquifers and deeper groundwater zones. Regional groundwater information that has been collected in the vicinity of the MRP and LBA area and similar hydrogeologic conditions in surrounding areas strongly suggest that the groundwater would most likely not be lost to the deep, inactive-zone groundwater system.

In a typical underground mining scenario, mining-related subsidence generally has the potential to affect water resources through the formation of new fissures, or in the case of the Lila Canyon Mine, both new fissures and the expansion of existing fissures that can alter the flow of groundwater and change the surface water and groundwater interaction. Subsidence has the potential to connect aquifers that were previously disconnected, change the rate and direction of groundwater movement, and change groundwater recharge and discharge rates. Discharge rates of the two springs in the proposed lease modification areas are monitored by UEI and reported to DOGM.

As discussed in Section 2.4.2.3 of this EA, mining-related subsidence is unlikely in coal mining operations with deep cover as is found in the proposed lease modification areas, and any mining-related subsidence effects to water resources would be mitigated by the physical properties of the geologic formations in the lease modification areas. According to the CHIA, “It is very unlikely that subsidence or subsidence fractures would reach the springs or recharge sources to cause any impacts” (DOGM 2007).

The proposed mining in the proposed lease modification areas would take place under 2,500 to 3,000 feet of cover, making subsidence-related effects to springs unlikely. This assessment comes from existing hydrogeologic investigations associated with nearby mine permitting activities. According to the Williams Draw Hydrologic Assessment, “visual observations over the Book Cliff mines…indicate little potential for any permanent fracturing at cover exceeding 1,000 feet” (Cirrus and Petersen 2017). The CHIA for the Book Cliffs Area V states that, “the areas of upper zone ground-water recharge and discharge on the Little Park Wash side of Patmos Ridge are outside the limits of projected subsidence” (DOGM 2007) (MRP-Part B, Plate 7-1A). Finally, according to the Lila Canyon Project Environmental Assessment, “the presence of a generally thick overburden serves to dampen subsidence” (BLM 2000).

Mining would occur at approximately 1,900 feet below Pine Spring, and between 1,500 to 2,200 feet below spring L-8-G (DOGM 2007). At this depth of cover, mining-related subsidence is not anticipated to impact surface water or shallow groundwater. Because subsidence-related impacts on springs in the lease modification areas are expected to be minimal, there is no reason to anticipate that impacts on groundwater quality might occur. As previously mentioned, the springs are connected to the shallow recharge area, which is well above the zone where any coal mining would take place; therefore, it is unlikely that water quantity would be affected by the Proposed Action. Fractures at the surface can be filled in rapidly because the natural erosion process will wash fine substrate over cracks during rainstorms or snowmelt.

Any potential impacts to groundwater resources under the Proposed Action from mining-related subsidence would be mitigated by characteristics of the geologic formations in the proposed lease modification areas. Fractures and fissures introduced by subsidence from mining activity can be sealed by clays that are highly plastic and have the tendency to swell. Clays are abundant in the geologic formations surrounding the active-zone and inactive-zone groundwater systems in the proposed lease modification areas. When groundwater is present, any surrounding shale layers tend to swell and seal subsidence fractures. Water movement through newly created fractures or fissures is restricted by this phenomenon (DOGM 2007).

3.4.3.2 Surface Water

No impacts to surface water resources in the proposed lease modification areas are expected from mining-related subsidence due to the depth of the mining operations and lack of surface disturbances. Furthermore, there is no reasonably foreseeable mechanism for surface water quality in the proposed lease modification areas to be impacted by mining operations under the Proposed Action.

There would be no impacts to surface water resources in the proposed lease modification areas due to mine dewatering because the Lila Canyon Mine typically reuses and recycles water within the Mine, the discharge point is an ephemeral wash, and based upon calculations of a continuous flow, water from the Mine would not reach the Price River approximately 12.7 miles away.

Water not used or stored in the Lila Canyon Mine or lost to evaporation will be discharged to the Right Fork of Lila Wash via UPDES 002 (Site L-5-G). Rule R645-301-751 requires that a coal mine discharge must meet state and federal water quality and discharge standards. According to the CHIA, potential discharges of 500 gpm (1.1cfs) and a maximum discharge rate of 2,080 gpm were evaluated. With a constant flow rate of 2,080 gpm, (4.63 cfs), the mine discharge effect would be limited to a distance of 8.5 miles. At 500 gpm (1.1 cfs), the mine discharge would flow for 3.4 miles before completely infiltrating into the alluvium (DOGM 2007). The discharge was compared to the bankfull channel level. It was found that the Mine discharge is significantly less than the bankfull level and that a continuous discharge would not reach a perennial stream (DOGM 2007).

According to the CHIA, no impacts are expected if mine water is discharged. Groundwater intercepted in the Mine is stored in sumps and treated prior to any discharges. Discharges are monitored by the state under the UPDES program.

3.4.3.3 Cumulative Effects

The past and present actions that would affect water resources are underground mining operations. Reasonably foreseeable future actions in the vicinity of the proposed lease modification areas are discussed in Section 3.1.2 of this document. Past, present, and reasonably foreseeable future actions are listed in Appendix C.

The spatial analysis area to examine cumulative effects to water resources extends to the CIA boundary from the CHIA (DOGM 2007). The CIA of the CHIA is approximately 73,000 acres and extends from the Patmos Ridge on the east side to the Price River on the west side. The large area of land from the base of the Book Cliffs to the Price River will not be affected by mining

activity but was included in the CIA because nearby waterways that form part of the CIA boundary are included in the CHIA (DOGM 2007).

Cumulative impacts to groundwater resources with the addition of the proposed lease modification areas to the existing Lila Canyon Mine would occur as the result of the anticipated increase of 2 to 3 years to the life of the Mine. Any potential impacts to groundwater resources from mining-related subsidence would be mitigated by characteristics of the geologic formations in the proposed lease modification areas. Surface water and groundwater monitoring and subsidence monitoring would continue per permit conditions.

There would be no cumulative effects to surface water resources in the CHIA from mining-related subsidence or from mine dewatering other than the continuation of potential for discharge during the additional 2 to 3 years of mining. Discharge monitoring would continue.

According to the Lila Canyon MRP, "Waddell et al. (1986) conclude that the perched nature of the upper zone formations protects them from the influence of dewatering of the coal-bearing zone unless the upper zone is influenced by subsidence" (DOGM 2010). Mining-related subsidence is not likely to affect the shallow groundwater given the depth of cover in the proposed lease modification areas, "as the strains from subsidence are not expected to reach the level of the upper groundwater zone" (DOGM 2010).

Groundwater in saturated zones of the Blackhawk Formation is isolated and relatively immobile due to surrounding impermeable layers and extremely low hydraulic conductivity (DOGM 2010). The average hydraulic conductivity for the Blackhawk Sandstone (3.0×10^{-6} centimeter per second [cm/sec] or 0.01 inch per day) was used to estimate the groundwater travel time in this formation and determined it would take 1,736 years for groundwater to travel 1 mile. Additionally, "the water encountered and used underground would not reach the Colorado Drainage in any reasonable time, if ever, and thus water consumed underground cannot negatively affect the Colorado River Basin" (DOGM 2010). Therefore, the proposed lease modification areas would extend the duration of mining activity in the CIA but would not result in cumulative impacts to groundwater and surface water resources when added to other past, present, and reasonably foreseeable future actions in the CIA.

3.5 Geology, Minerals, and Energy Production

The analysis area for potential direct, indirect, and cumulative effects on geology is the LMA areas. The analysis area for minerals and energy production is Emery and Carbon Counties as the data are summarized by each county. Leasing for oil and gas or other mineral resources, however, would only be affected within the LMA areas. Energy development as related to GHG and climate effects is discussed on local, regional, and national scales (see Appendix D). The BLM's PFO RMP objectives for minerals and energy resources are to maintain coal leasing, exploration, and development; maintain opportunities to lease other solid minerals; and manage oil and gas leasing all while minimizing impacts to other resource values (BLM 2008).

3.5.1 Affected Environment

Physiographically, the Lila Canyon Mine is included in the Colorado Plateau province. The Unita Basin lies to the northeast, the San Rafael Swell to the southwest, and the Wasatch Plateau to the west. The Lila Canyon Mine is situated in the western Book Cliffs, an escarpment that

extends east and south from Castle Gate to Green River, Utah, then east to Grand Junction, Colorado, a distance of 180 miles (DOGM 2007).

The coal resources of the Book Cliffs coal field are exposed in the south-to-southwest–facing Book Cliffs that form the southern margin of the Roan Plateau. The coal beds of economic importance in the Book Cliffs coal field are Upper Cretaceous in age and are confined to the Blackhawk Formation of the Mesaverde Group. The Mesaverde Group in the Lila Canyon Mine vicinity consist of three formations which are, in ascending order, the Blackhawk Formation, Castlegate Sandstone, and the Price River Formation. The Blackhawk Formation is a mixed marine and continental environment. The Castlegate Sandstone and the Price River Formation were formed in a continental environment. The bluish-gray shale of the Mancos Shale crops out below the base of the Book Cliffs and in places is capped by pediment deposits from the Pleistocene. Sandstone beds of the Blackhawk Formation crop out in steep and precipitous cliffs and ledges above the Mancos Shale.

The Mesaverde Group's Blackhawk Formation contains the important coal-bearing zones within the region. Two coal seams, the Upper Sunnyside and Lower Sunnyside seams, are located in the Blackhawk Formation. The Sunnyside Coal Zone outcrops near the top of the Book Cliffs escarpment and dips eastward at 7–8 degrees between N75°E and N90°E. Because the surface topography rises in the direction of the dip, the overburden thickness above the Sunnyside Coal Zone increases rapidly to the east. Overburden cover in the LMA areas ranges from around 1,500 feet in the southeastern part of U-0126947 to about 3,500 feet at the eastern extent of the LMA areas.

A major system of transverse, easterly trending normal faults, radial from the San Rafael Swell, have been mapped in the Lila Canyon Mine area. Vertical displacements of the faults range from 15 feet to more than 275 feet with displacement diminishing toward the east, in the vicinity of the LMAs. The Central Graben Fault is near the southern boundary of the existing Lila Canyon Mine and is mapped as extending eastward into the LMA area. The Entry Fault, to the north of the Central Graben Fault, is also mapped as extending into the LMA area. Unmapped minor faults may also be present. The geologic fault pattern is that of a series of horsts and grabens. (DOGM 2007).

The LMA areas are open to oil and gas leasing subject to minor constraints (timing limitations, controlled surface use, lease notices) (BLM 2008: Map R-25). However, there are no existing federal oil and gas leases in the LMA areas. The PFO RMP Management Decision MLE-4 states that the BLM must identify the priority energy resource in conflict areas to promote safe and efficient extraction of energy resources (BLM 2008).

DOGM oil and gas production data for the last 5 years show that as of September 2019, there were no APDs in Emery County in 2019, there was one APD in 2018, there was one APD in 2017, and there were no APDs in 2016 and 2015 (DOGM 2019a). During that same period in Carbon County, there were a total of 36 APDs. Additionally, there have been four APDs on federal lands in Emery County with helium as the objective.

Oil production in Emery County was 608 barrels (BBL) or less each year from 2015 to 2019. In Carbon County, oil production ranged from nearly 28,000 BBL in 2019 (partial year) to nearly 88,000 BBL in 2015. Oil and gas production were at least four times higher in Carbon County than in Emery County for each year shown in Table 3-20. Oil and gas production in the region is described in Appendix D.

Table 3-20. Emery and Carbon Counties Oil and Gas Production 2015–2019

	County	2015	2016	2017	2018	2019*
Oil (in BBL)	Emery	184	608	571	347	157
	Carbon	87,968	79,247	57,792	47,386	27,868
Natural gas (in MCF) (includes coalbed CH_4)	Emery	8,630,719	8,143,306	7,466,663	6,952,008	3,966,722
	Carbon	69,382,875	55,684,110	46,883,601	42,229,697	24,889,453
Coalbed CH_4	Emery	6,533,904	6,058,638	5,553,126	5,211,245	2,026,546
	Carbon	32,160,461	29,959,808	27,517,370	25,661,224	9,980,625

Source: DOGM (2019a).

Note: 1 BBL = 42 U.S. gallons; 1 MCF = 1,000 cubic feet.

* 2019 data as of October 2, 2019, through last complete reporting period.

There are no active mineral mines in or near the LMA areas. According to DOGM records, the closest active mineral mines are for clay, gypsum, or humic shale, and these are in the western part of Emery County (DOGM 2019b), approximately 50 miles southwest of the Lila Canyon Mine. There are no gravel extraction pits in the LMA areas or contiguous to them. Within approximately 10 miles of the LMA areas there are two permitted gravel pits, one on the Lila Canyon Mine road 3 miles west of the mine entrance and another approximately 10 miles north-northwest.

3.5.2 Environmental Impacts – Alternative A: No Action

Under the No Action alternative, the BLM would not approve UEI's application for federal coal reserves on approximately 1,272.64 acres (317.84 acres added to lease UTU-014218 and 954.80 acres added to lease UTU-0126947) and the federal coal resources contained in the two lease modifications would not be mined. The coal reserves in the lease modifications would most likely be permanently bypassed. The 1,272.64-acre LMA area would continue to be available for oil and gas leasing.

3.5.2.1 Cumulative Effects

There are no existing oil and gas leases or other mineral resource leases in the LMA areas. Ongoing oil and gas production in Carbon and Emery Counties (see Table 3-20) would be expected to continue based on economics and demand. The availability of the LBA area for oil and gas leasing would add 4,231.40 acres to the areas in Emery and Carbon Counties currently available for oil and gas leasing. Present mineral or coal mining activities in Emery and Carbon Counties (see Appendix C) would be expected to continue. Because the LMA areas would not be leased under the No Action alternative, there would be no impacts to geology, minerals, or energy production from mining in the LMAs. Therefore, there would be no cumulative impacts to geology, minerals, and energy production under the No Action alternative.

3.5.3 Environmental Impacts – Alternative B: Proposed Action

Under the Proposed Action, all of the economically mineable coal would be removed from the LMA areas. There would be no other impacts to the tract geology other than the areas of subsidence above the mined-out coal seam and associated potential interruptions to stratigraphy. Oil and gas exploration and development, as well as other mineral resource development, would not be feasible while active mining is ongoing. Therefore, the LMA areas would be unavailable for oil and gas leasing and other mineral resources development during the 2 to 3 years of mining

in the LMAs. Based on the current lack of non-coal mineral activity in the LMA areas, this would have minimal impact upon mineral resource development in Emery County during the life of the mine. There would be no impact to the development viability of gravel extraction pits near the LMA areas.

Oil and gas development is presently not occurring in the LMA areas, and production is considerably lower in Emery County as compared to Carbon County (see Table 3-20). Based on this, the loss in availability of the LMA areas for oil and gas development would have minimal impact on the overall development of oil and gas resources in the region during the life of the mine. Once mining operations and reclamation are completed, the LMA areas would again be available for oil and gas leasing.

3.5.3.1 Cumulative Effects

There are no existing oil and gas leases or other mineral resources leases in the LMA areas or in this part of Emery County. Under the conceptual mine plan, the mining of coal in the LMA areas, in addition to the proposed Williams Draw LBA (if offered and leased), SITLA leases, and existing Lila Canyon Mine, would not be likely to change the currently permitted not-to-exceed production level of 4.5 million TPY. The total 2019 coal production in Carbon and Emery Counties was 9,734,000 tons (Table C-1); the Lila Canyon Mine permitted not-to-exceed production level is 46% of this total 2019 coal production.

The future addition of mining in the proposed Walker Flat coal tract may add up to 2 million tons per year, if offered and leased. The economically mineable coal would be removed from these tracts and unavailable for future leasing. Other than coal extraction, there would be no cumulative effects to geology other than potential subsidence of layers above the mined coal seams and associated potential interruptions to stratigraphy (which would not impact future oil and/or gas development due to their relative stratigraphic location in the geologic column).

Restrictions on oil and gas activity or mineral exploration or production would be implemented in all areas in Utah including the LMA areas (if leased) leased for coal development. The cumulative impacts to minerals and oil and energy activity would be a delay in the availability for such exploration or development in all areas leased for coal development for the duration of that coal development. Mineral mining in other areas of Carbon and Emery Counties (see Appendix C) would be expected to continue.

3.6 Colorado River Endangered Fish

The analysis area for potential direct, indirect, and cumulative effects on Colorado River endangered fish is the 50-km near-field air quality modeling analysis area described in Section 3.2. This area was chosen because there is no perennial surface water pathway between the LMA areas and the Colorado River system. The potential pathway for effects to fish is atmospheric dry deposition on the land or water surface. Mercury and selenium are contaminants of concern for fish in the Upper Colorado River basin. Both of these contaminants are emitted from coal-fired power plants and both elicit toxic effects at concentrations frequently observed in the environment; however, when they co-occur they can interact in complex ways, including selenium potentially ameliorating some mercury toxicity in fish (Day et al. 2020). Four species of endangered fish—the Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*)— live in the

Colorado River basin and nowhere else. These fish are threatened by predation and competition from non-native fish species, and by habitat loss and modification. The Colorado River endangered fish are described in Appendix E (SWCA 2020).

3.6.1 Affected Environment

There are no perennial waters in the LMA areas (see Section 3.4). A stretch of the Price River, which flows into the Green River, and a stretch of the Green River are within the 50-km analysis area. The Green River provides critical habitat for the Colorado River endangered fish. A recent study shows elevated levels of mercury and selenium in tissue samples of some Upper Colorado River fish (see Appendix E).

The Hunter and Huntington Power Plants are regulated by the DAQ and overseen by the EPA; they have operated since the 1970s emitting mercury and other trace elements such as arsenic, lead, and selenium. Emissions controls since 2011 for some elements have reduced emissions to the atmosphere. Mercury emissions from the Hunter and Huntington Power Plants are recently estimated to contribute less than 1% of the total deposition in the local airshed and river basins. Additional background information is provided in Appendix E.

3.6.2 Environmental Impacts – Alternative A: No Action

Under the No Action alternative, the Hunter and Huntington Power Plants would continue operating as permitted. There would be no direct effects to critical habitats in the analysis area or to Colorado River endangered fish from the operation of the Lila Canyon Mine. Trace elements from coal combustion will continue to be deposited on land and water, with the likelihood that certain elements will accumulate over time to levels that may indirectly cause harmful effects to some fish individuals.

3.6.2.1 Cumulative Effects

The cumulative effects of No Action would be similar to the effects of No Action, with the potential cumulative addition of regional and global atmospheric sources of contaminants to the Colorado River system.

3.6.3 Environmental Impacts – Alternative B: Proposed Action

There would be no direct effects to Colorado River endangered fish or their critical habitats as a result of the Proposed Action. The indirect effects of the combustion of coal from the LMAs would contribute minimally to overall mercury and selenium deposition in the analysis area (See Appendix E). While some Colorado pikeminnow individuals are likely experiencing low-level harmful effects from existing mercury in the system, the additional amount of mercury from the indirect effects of coal combustion from the LMAs would not be likely to measurably reduce population numbers, reproduction, or constrain Colorado pikeminnow distribution. The relative contribution of mercury is assumed to be a very small percentage of the total mercury that has been and will continue to be deposited in the analysis area. Indirect effects from the implementation of the Proposed Action may affect but are not likely to adversely affect the Colorado River endangered fish populations or their critical habitat (see Appendix E).

3.6.3.1 Cumulative Effects

The cumulative effects from implementation of the Proposed Action would be similar to the effects described for the Proposed Action because the combustion of the coal from the LMAs would contribute minimally to overall mercury deposition in the analysis area, and because the existing Hunter and Huntington Power Plants are permitted to release certain levels of contaminants into the atmosphere. The combustion of coal from the LMAs would not increase these allowable levels of contaminants. National standards are in place for coal-fired power plants to prevent about 90% of the mercury in coal from being emitted to the air. No new coal-fired power plants are proposed for construction that would add cumulatively to the mercury deposition on the analysis area. Hunter and Huntington Power Plants would continue to operate as permitted and would likely combust additional coal from a different source if the coal from the LMA areas was unavailable.

CHAPTER 4. CONSULTATION AND COORDINATION AND PUBLIC INVOLVEMENT

4.1 Tribes, Individuals, Organizations, or Agencies Consulted

As described above in Chapter 1, the BLM listed the Proposed Action on its ePlanning website on May 14, 2018. The BLM initiated tribal consultation in October 2018 with tribal representatives. Tribal consultation letters were sent on October 12, 2018, to 16 tribal governments with known interest and association with the region. A response letter dated October 18, 2018, was received from the Hopi Tribe requesting copies of any cultural resources reports or treatment plans should adverse effects be anticipated as a result of the development of the proposed lease modification areas.

The Office of Surface Mining Reclamation and Enforcement participated in this EA process as a cooperating agency. The U.S. Fish and Wildlife Service participated in informal consultation under Section 7 of the Endangered Species Act which concluded in concurrence on effects to Mexican spotted owl (*Strix occidentalis lucida*) and its designated critical habitat, and Colorado pikeminnow, razorback sucker, humpback chub, and bonytail (collectively referred to as Colorado River fishes), and their designated critical habitat (see Appendix E).

4.2 Public Involvement

Public and agency comments were sought via the BLM National NEPA Register (ePlanning) during the draft EA review period. The EA was open for public comment from April 24, 2020, to June 8, 2020. During the public comment period, there were 1,409 total submissions received via email and on ePlanning. Of this total, 1,318 were forms, two letters were from non-government organizations (NGOs), and one letter was from Emery County. A total of three submissions were in support of the project. Substantive comments were evaluated; some comments resulted in changes to the EA. The summarized comments and BLM responses are provided in Appendix F.

4.3 List of Preparers

The list of preparers is found in Appendix G.

APPENDIX A

BLM Interdisciplinary Team Checklist

APPENDIX A: INTERDISCIPLINARY TEAM CHECKLIST

INTERDISCIPLINARY TEAM CHECKLIST

RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)

Project Title: Lila Canyon Mine Lease Modifications

NEPA Log Number: DOI-BLM-UT-G020-2018-0039-EA

File/Serial Number: U-014218(M), U-0126947(M)

Project Leader: M Glasson

Determination of STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Determination	Resource/Issue	Rationale for Determination	Signature	Date
PI	Air Quality & Greenhouse Gas Emissions	Impacts from this proposed lease modification could extend the life of the Mine by 2 to 3 years, resulting in continued operational emissions (including GHG) from equipment operation. In addition, downstream use of the coal would result in emissions. The EA will assess the effects of operational and downstream emissions.	Stephanie Howard	5/25/2018
NP	BLM Outstanding Natural Areas	There are no BLM Natural Areas in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Cultural: Archaeological Resources	The Proposed Action is determined to be a federal undertaking, per Title 36 CFR Chapter VIII Part 800.16(y). In accordance with Title 36 CFR 800.3(a)(1), the agency has determined this undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties are present. Therefore, the agency has no further obligations under Section 106 of the National Historic Preservation Act regarding the proposed lease modifications. The BLM is applying Waiver #7 to the Proposed Action: the nature of the proposed subsurface action is such that no impact to significant cultural resources is expected. In accordance with Title 36 Code of Federal Regulations Chapter VIII Part 800, the BLM will not approve any ground disturbing activities that have the potential to cause effects on historic properties until the areas of potential effect have been analyzed and processed according to Section 106 of the National Historic Preservation Act and related authorities. The modification of a lease does not authorize any surface disturbing activities, including, but not limited to, development of surface facilities, vents, portals, or planned subsidence with the potential to effect ground surface. The BLM may require modifications to facility development proposals to protect historic properties or disapprove any activity that is likely to result in adverse effect to historic properties that cannot be successfully avoided, minimized, or mitigated.	Natalie Fewings	7/11/2018
NI	Cultural: Native American Religious Concerns	Tribal consultation letters were sent to 16 tribal governments with known interest and association with the region on 10/12/18. A response letter dated October 18, 2018, was received from the Hopi Tribe requesting copies of any cultural resources reports or treatment plans should adverse effects be anticipated as a result of the development of the proposed lease modification areas. The agency decided this lease modification does not have the potential to effect historic properties, should historic properties exist in the area (36 CFR 800.3(a)(1), No other responses were received.	Natalie Fewings	10/20/2020
NP	Designated Areas: National Historic Trails	There are no National Historic Trails in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020
NP	Designated Areas: Areas of Critical Environmental Concern	There are no Areas of Critical Environmental Concern in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020
NP	Designated Areas: Wild and Scenic Rivers	There are no Wild and Scenic Rivers in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020
NP	Designated Areas: WSA/Wilderness	There are no Designated Areas, Wilderness Study Areas, or Wilderness Areas in the proposed lease modification areas per review of the RMP and GIS. Portions of the lease modification areas were not mapped at that time due to RMP Decision MLE-3, which removes wilderness study areas (WSAs) from consideration for coal leasing. At the time the LMA was submitted to BLM, the Turtle Canyon WSA extended into the lease modification areas. With enactment on March 12, 2019, of the John D. Dingell, Jr. Conservation, Management, and Recreation Act (P.L. 116-9) (the Act) (see Section 1.6), there is no longer a Turtle Canyon WSA. The Act designated a new Turtle Canyon Wilderness Area which is not contiguous to and does not encumber the proposed lease modification areas. The proposed lease modification is outside of Turtle Canyon Wilderness Area.	Blake Baker	10/20/2020
NP	Environmental Justice	No low income or minority communities exist in or near the proposed lease modification areas. Therefore, no disproportionate impacts will occur.	Stephanie Howard	5/25/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NP	Farmlands (prime/unique)	According the NRCS soil survey and knowledge of the area, there are no prime/unique farmlands above the proposed lease modification areas. The Proposed Action will occur underground and there are no prime/unique farmlands that would be affected by proposed lease modification or subsequent mining.	Stephanie Bauer	7/2/2018
NP	Fuels/Fire Management	There are no current impacts to Fuels/Fire Management (both direct and indirect) at this time. Future impacts would be negligible.	Stuart Bedke	4/5/2018
PI	Geology / Minerals / Energy Production	This proposal is a beneficial use of the mineral at the site. It is consistent with the goals and objectives of the BLM Price Field Office as documented in the PFO Resource Management Plan. The sub-surface extraction of coal would not remove any surface deposits. There are no federal oil & gas leases in the project area. The project area is open to oil & gas leasing subject to minor constraints. It would not be feasible for exploration or production of oil and gas while active mining is ongoing.	Mike Glasson	10/14/2020
NI	Invasive Plants / Noxious Weeds / Vegetation	The spread and introduction of invasive species/noxious weeds are not anticipated to occur because of the Proposed Action. The proposed lease modification areas are underground, and no subsidence is expected, therefore no surface disturbance is expected.	Stephanie Bauer	7/2/2018
NI	Lands/Access	With no surface use or disturbance, lands and access will not be impacted. A review of LR2000 and the Master Title Plats showed that the Proposed Action is compatible with the existing land use and authorized rights-of-way. There are no conflicts with other land use authorizations.	Connie Leschin	4/9/2018
NI	Lands with Wilderness Characteristics	The proposed project area overlaps the Turtle Canyon LWC unit. However, with no surface use or disturbance, Lands with Wilderness Characteristics will not be impacted.	Blake Baker	2/21/2020
NI	Livestock Grazing	With no surface disturbance, livestock grazing will not be impacted.	Jason Carlile	4/23/2018
NI	Paleontology	While there is some potential for vertebrate fossils being present, with no surface disturbance there is no risk of damage to them.	Michael Leschin	4/10/2018
NI	Plants: BLM Sensitive	Suitable or occupied habitat for the following UT BLM Sensitive plant species has been previously documented or is expected to occur within Emery County, UT. *Alicella tenuis, Astragalus pubentissimus peabodianus, Camissonia bolanderi, Cryptantha creutzfeldtii, Eriogonum corybosum smithii, Erigeron maguirei, Lygodesmia grandiflora entrada, Mentzelia multicaulis var librina, Oreoxis trotteri, Psorothamnus polydenius jonesii, Sphaeralcea psoraloides, Talinum thompsonii* Analysis of soils, geology, elevation, and ecological systems, overlying the proposed lease modification areas indicates potential that suitable habitat for *Mentzelia multicaulis var librina* occurs there. There are possible exposures of suitable geology, Price River Formations, and it is close to the typical elevation. Although suitable habitat for this plant occurs, there would be no impacts to habitat because no surface disturbance is proposed or anticipated. Based on the depth of the coal seam from 2,000 to 3,000 feet, no surface expression of subsidence is anticipated. For the other species, there is not suitable geology or elevation within the proposed lease modification areas, and there are no records of occurrences. Because suitable habitat is not present, these species are unlikely to be present. For these reasons and because no surface disturbance is proposed or anticipated, a detailed analysis of BLM sensitive plants is not required.	Dana Truman	08/24/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Plants: Threatened, Endangered, Proposed, or Candidate	Several Federally listed plant species occur within Emery County. *Cycladenia jonesii (humilis)* *Pediocactus despainii* *Pediocactus winkleri* *Schoenocrambe barnebyi* *Sclerocactus glaucus* *Sclerocactus wrightiae* *Townsendia aprica* Analysis of soils, geology, elevation, and ecological systems, within the proposed lease modification areas indicates that suitable habitat for the identified species is not present. Since suitable habitat is not present, these species are unlikely to be present. Because these species are unlikely to be present and no surface disturbance is proposed or anticipated, detailed analysis of threatened, endangered, proposed, or candidate plants is not required.	Dana Truman	5/16/2018
NI	Rangeland Health Standards	Rangeland Health standards reflects hydrology, soils, and biotic components of the rangeland. No impacts to soils, hydrology or biology are anticipated due to lack of surface disturbance in the proposed lease modification areas. Impacts to these resources, if any, will be addressed in their respective sections.	Jason Carlile	4/23/2018
NI	Recreation	The Proposed Action is in an Extensive Recreation Management Area (ERMA) where recreation opportunities are limited, and explicit recreation management is not required. The ERMA receives only custodial management for recreation opportunities. With no surface disturbance, no impacts to this resource are anticipated.	Blake Baker	2/21/2020
PI	Socio-Economics	Issuance of the proposed lease modifications could extend the life of the Lila Canyon Mine by 3+ years. The analysis of extension of operations will be assessed, including the effects upon the Emery and Carbon County economies.	Stephanie Howard	5/25/2018
NI	Soils: Physical / Biological	There is no new surface disturbance proposed or anticipated. Based on the depth of the coal seam (from 2,000 to 3,000 feet), no surface expression of subsidence is anticipated. A color infrared aerial photography study is conducted periodically as part of DOGM monitoring commitments under the Lila Canyon Mine permit approval. The study monitors impacts of subsidence on surface vegetation communities. The baseline data were gathered in 2011, and the study was repeated in 2016 per the 5-year interval requirement. No differences were observed between 2011 and 2016, suggesting that if subsidence occurred, it has had little impact to the plant and soil communities at the Lila Canyon Mine. Therefore, detailed analysis is not required.	Stephanie Bauer	1/4/2021
NI	Vegetation: Vegetation Excluding USFW Designated Species and BLM Sensitive Species	There is no new surface disturbance proposed or anticipated. Based on the depth of the coal seam (from 2,000 to 3,000 feet), no surface expression of subsidence is anticipated. A color infrared aerial photography study is conducted periodically as part of DOGM monitoring commitments under the Lila Canyon Mine permit approval. The study monitors impacts of subsidence on surface vegetation communities. The baseline data were gathered in 2011, and the study was repeated in 2016 per the 5-year interval requirement. No differences were observed between 2011 and 2016, suggesting that if subsidence occurred, it has had little impact to the plant and soil communities at the Lila Canyon Mine. Therefore, detailed analysis is not required.	Stephanie Bauer	1/4/2021

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Visual Resources	The proposed lease modification areas are within a VRM Class I. The Class I management objective is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention. Since no surface disturbance is proposed or anticipated, there will be no impact to visual resources and the existing character of the landscape will be maintained. Detailed analysis of visual resources is not required.	Blake Baker	2/21/2020
NI	Wastes (hazardous/solid)	No chemicals subject to reporting under SARA Title III will be used, produced, stored, transported, or disposed of annually in association with the Proposed Action. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, will be used, produced, stored, transported, or disposed of in association with the Proposed Action. Trash would be confined in a covered container and disposed of in an approved landfill. No burning of any waste will occur due to this project. Human waste will be disposed of in an appropriate manner in an approved sewage treatment center.	Bill Civish	5/11/2018
PI	Water: Groundwater Quality	Spatial analysis of the proposed lease modification application and proposed lease modification areas indicates no interaction with subsurface horizons containing usable water. The proposed mining of the proposed lease modification areas is approximately 2,500 feet below the ground surface. Additional groundwater information will be reviewed to determine the potential for impacts.	Rebecca Anderson	10/26/2018
NI	Water: Hydrologic Conditions (stormwater)	The proposed mining associated with the proposed lease modification areas would not alter the topography; therefore, detailed analysis is not required.	Jerrad Goodell	12/10/2020
NP	Water: Municipal Watershed / Drinking Water Source Protection	GIS review indicate no drinking water source areas or beneficial uses of watersheds from UDEQ-DWQ.	Jerrad Goodell	12/10/2020
NI	Water: Streams, Riparian Wetlands, Floodplains	There are no perennial water resources in the LMA areas or in the Lila Canyon Mine permit area. The LMAs and the SCT are in the Price River Basin; the Hunter and Huntington Power Plants are in the San Rafael River Basin; both of these rivers are tributary to the Green River, which joins the Colorado River. Any mine water discharges are expected to infiltrate within approximately 3.4 miles of the point of discharge and would not reach the Price River, about 12.7 miles from the LMA. Additionally, due to the depth of the mining operation, and lack of surface disturbance, no impacts to these resources are expected. Detailed analysis is not required.	Jerrad Goodell	12/10/2020
PI	Water: Surface Water Quality	There are 2 spring systems in the lease modification areas: L-8-G and L-9-G (Pine Spring). The interaction of mine activities with the springs and intermittent stream channel needs to be analyzed in detail to determine impacts.	Jerrad Goodell	10/23/2020
NI	Water: Water Rights	Water rights proximate to the LMA areas are 91-2539 (owned by the BLM), 91-808, and 91-2538 (a water right used for stock watering owned by the State of Utah). Mining of the proposed lease modification areas would not affect any water rights or the ability to use any water rights because of the depth of mining and lack of surface disturbance. With 1,500 to 2,100 feet of cover above mined areas, mining-related subsidence is not anticipated to impact surface water or shallow groundwater. Detailed analysis is not required.	Jerrad Goodell	12/10/2020
NP	Water: Waters of the U.S.	GIS review indicates no navigable waters or waters of the U.S. are within the proposed lease modification areas. Detailed analysis is not required.	Jerrad Goodell	12/10/2020

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NP	Wild Horses and Burros	The proposed lease modification areas are not within a Wild Horse or Burro Herd Management Area. Detailed analysis is not required.	Mike Tweddell	4/2/2018
NI	Wildlife: Migratory Birds (including raptors)	Migratory birds could use the area above the proposed lease modification areas foraging and nesting. There are known golden eagle nests within 3 miles of the proposed lease modification areas, but not within surface habitat overlying the areas. Due to the depth of the mining operation, and lack of surface disturbance, no impacts to bird populations or their habitat is expected. Detailed analysis is not required.	Dana Truman	5/16/2018
PI	Wildlife: Fish (designated or non-designated)	**Direct Effects**: The LMAs and the SCT are in the Price River Basin; the Hunter and Huntington Power Plants are in the San Rafael River Basin; both of these rivers are tributarys to the Green River, which joins the Colorado River. The Colorado River system is home to several non-designated fish species and four listed under the Endangered Species Act: Bonytail (*Gila elegans*) - endangered; Colorado pikeminnow (*Ptychocheilus lucius*) - endangered; humpback chub (*Gila cypha*) - proposed for reclassification from endangered to threatened; and razorback sucker (*Xyrauchen texanus*) - endangered. Colorado River depletions are monitored under the Colorado River Endangered Fish Recovery Program. Any mine water discharges are expected to infiltrate within approximately 3.4 miles of the point of discharge and would not reach the Price River, approximately 12.7 miles from the LMA. As part of their DOGM annual permit report, the Lila Canyon Mine is required to submit a depletion estimate under the Colorado River Endangered Fish Recovery Program. Consumptive water use calculations for the past 4 years (2016–2019 DOGM annual report years) range from 0.062 to 0.066 cfs. There are no perennial water resources in the LMA areas or in the Lila Canyon Mine permit area. There are no fish species (including their associated habitats) within or near the LMA areas or the Lila Canyon Mine permit area per GIS mapping of streams and sensitive fish species occurrences, therefore direct impacts to designated and non-designated fish species is not expected. **Indirect Effects:** Mercury and selenium deposition within the Colorado river watershed from coal combustion is possible. This could lead to bioaccumulation and potentially impact fish habitat and populations; these impacts are discussed in detail in Appendix E. The BLM conducted informal consultation with the U.S. Fish and Wildlife Service to assess the potential for effects of the Proposed Action on the populations of Colorado River federally- listed fishes or their habitats. This concluded in USFWS concurrence with the finding of “may affect but not likely to adversely affect” the four endangered fish species in the Colorado River and their critical habitat; the concurrence letter is included as supporting documentation to this EA on ePlanning.	Jerrad Goodell	12/10/2020
NI	Wildlife: Non-USFWS Designated	There are no UDWR designated crucial habitats for big game within the proposed lease modification areas. Mining activities have been occurring on the adjacent leases for the past several years. There have been no measurable changes to the wildlife populations. The wildlife guzzlers and habitat treatments for the big horn sheep have been effective mitigation for the past mining activities. Due to the depth of the mining operation and lack of surface disturbance, no impacts are expected to the surface habitat for general wildlife. Detailed analysis is not required.	Dana Truman	5/16/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Wildlife: BLM Sensitive	Several BLM sensitive species could use the proposed lease modification areas for foraging, resting, or nesting. Mining on the adjacent leases has been occurring without measurable impacts to wildlife. The springs have been and will be consistently monitored for change in quantity and quality. According to the Approved Resource Management Plan Amendments (BLM 2015), designated sage-grouse GHMA habitat is approximately 7 miles away. Due to the existing monitoring and response plan and the expected lack of surface disturbance, no impacts to sensitive wildlife populations or their habitat is expected. Detailed analysis is not required.	Dana Truman	5/16/2018
NI	Wildlife: Threatened, Endangered, Proposed or Candidate	Suitable or occupied habitat for the following Federally listed species has been previously documented or is expected to occur within Emery County (IPaC5/16/18). California condor (*Gymnogyps californianus*) [CACO] -Would be an unlikely visitor to the proposed lease modification areas due to the elevation, and other habitat considerations. Mexican spotted owl (*Strix occidentalis lucida*) [MSO]– Designated critical occurs within the proposed lease modification areas Southwestern willow flycatcher (*Empidonax traillii extimus*) [SWFL]– Designated critical habitat greater than 30 miles away. Yellow billed cuckoo (*Coccyzus americanus*) [YBCC] – Suitable habitat greater than 10 miles away associated with the Green River or Price River. Analysis of elevation and habitat requirements, overlying the proposed lease modification areas indicates that suitable habitat for the CACO, SWFL, and YBCC is not present. Since suitable habitat is not present, these species are unlikely to be present in habitat overlying the proposed lease modification areas. Since these species are unlikely to be present and no surface disturbance is proposed or anticipated, a no effect determination was made and detailed analysis is not required. The Lila Canyon Lease Modifications overlap the CP-15 unit of Designated Critical Habitat for the MSO. There are approximately 186,360 acres within the CP-15 unit. The Lila Canyon Lease modification is on the southern edge of the habitat unit and overlaps 166 acres or less than 1 percent of critical habitat. No surface disturbance is proposed or anticipated and the mining activities would be through the existing portals that are well outside the critical habitat. Due to the lack of surface disturbance, and no change in the mining activities at the surface, there would be no impact to the designated Critical Habitat for MSO or effects to the physical or biological features that are essential to the conservation of the species. A no effect determination was made and detailed analysis is not required.	Dana Truman	8/24/2018
NI	Woodlands/ Forestry	Woodlands/Forestry occur on the surface within the proposed lease modification areas. However, no subsidence is anticipated. Detailed analysis is not required.	Stephanie Bauer	7/2/2018

FINAL REVIEWS

Reviewer Title	Signature	Date	Comments
Environmental Coordinator	JOSEPH RODARME Digitally signed by JOSEPH RODARME Date: 2021.01.04 16:25:36 -07'00'		
Authorized Officer	CHRISTOPHER CONRAD Digitally signed by CHRISTOPHER CONRAD Date: 2021.01.04 19:15:51 -07'00'		

APPENDIX B

Lease Stipulations

SPECIAL STIPULATIONS FOR UTU-014218
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.

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

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

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

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

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

11. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulation of the surface management agency.

12. 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.

13. 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.

14. Notwithstanding the approval of a resource recovery and protection plan (R2P2) 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 un-minable 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.

15. The lessee, at his expense, will be responsible to replace any surface water sources identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses (authorized by 26 CFR 251).

16. 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.

17. 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.

18. 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.

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 Office 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.

19. FAIR MARKET VALUE BONUS: Pursuant to 43 CFR 3432.2(c), "the lands applied for shall be added to the existing lease without competitive bidding, but the United States shall receive the fair market value of the lease of the added lands, either by cash payment or adjustment of the royalty applicable to the lands added to the lease by the modification." The BLM will implement this requirement by adding the bonus obligation owed for mining the coal in these two tracts and it will be reported in addition to the royalty. The lessee will pay the fair market value (FMV) bonus payment for the coal resources produced in the Federal coal lease modifications for Federal Coal Leases UTU-014218 designated as Tract 2 and UTU-0126947 designated as Tract 2 on the Federal Coal Lease Form.

The FMV was determined at $0.39 per ton of the actual coal produced. This rate shall be adjusted by the BLM annually (previous 12 months) 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 the bonus shall be at the specified FMV rate ($0.39 per ton) plus the adjustment times the monthly tonnage mined in each tract. This 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 underground royalty of 8% (or approved reduced royalty rate) and the value for the lease bonus payment ($0.39 plus adjustment). The lessee shall notify the BLM when mining has begun on the tracts and the BLM will calculate the adjustment value of the bonus bid for the next 12 months. Each month as part of the production verification, the lessee shall identify to the BLM the amount of coal mined in these 2 tracts as a separate line item on the submission.

20. In addition, the lessee shall employ measures that will minimize exposure of the general public to air pollutants exhausting from mine portals/adits. Measures may include the use of fencing or other physical barriers, natural barriers, signage, or other measures that preclude public access to the portals/adits. Persons who require legal or practical access to the air vents, such as mine employees or business invitees and guests of the mine, are not considered members of the general public and would continue to have access to these areas.

SPECIAL STIPULATIONS FOR UTU-0126947 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.

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

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

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

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

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

11. If removal of timber is required for clearing of construction sites, etc., such timber shall be removed in accordance with the regulation of the surface management agency.

12. 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.

13. 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.

14. 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 un-minable 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.

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15. The lessee, at his expense, will be responsible to replace any surface water sources identified for protection, that may be lost or adversely affected by mining operations, with water from an alternate source in sufficient quantity and quality to maintain existing riparian habitat, fishery habitat, livestock and wildlife use, or other land uses (authorized by 26 CFR 251).

16. 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.

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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.

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 Office 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.

19. FAIR MARKET VALUE BONUS: Pursuant to 43 CFR 3432.2(c), "the lands applied for shall be added to the existing lease without competitive bidding, but the United States shall receive the fair market value of the lease of the added lands, either by cash payment or adjustment of the royalty applicable to the lands added to the lease by the modification." The BLM will implement this requirement by adding the bonus obligation owed for mining the coal in these two tracts and it will be reported in addition to the royalty. The lessee will pay the fair market value (FMV) bonus payment for the coal resources produced in the Federal coal lease modifications for Federal Coal Leases UTU-014218 designated as Tract 2 and UTU-0126947designated as Tract 2 on the Federal Coal Lease Form.

The FMV was determined at $0.39 per ton of the actual coal produced. This rate shall be adjusted by the BLM annually (previous 12 months) 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 the bonus shall be at the specified FMV rate ($0.39 per ton) plus the adjustment times the monthly tonnage mined in each tract. This 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 underground royalty of 8% (or approved reduced royalty rate) and the value for the lease bonus payment ($0.39 plus adjustment). The lessee shall notify the BLM when mining has begun on the tracts and the BLM will calculate the adjustment value of the bonus bid for the next 12 months. Each month as part of the production verification, the lessee shall identify to the BLM the amount of coal mined in these 2 tracts as a separate line item on the submission.

20. In addition, the lessee shall employ measures that will minimize exposure of the general public to air pollutants exhausting from mine portals/adits. Measures may include the use of fencing or other physical barriers, natural barriers, signage, or other measures that preclude public access to the portals/adits. Persons who require legal or practical access to the air vents, such as mine employees or business invitees and guests of the mine, are not considered members of the general public and would continue to have access to these areas.

APPENDIX C

Description of Connected Actions and Past, Present, and Reasonably Foreseeable Future Actions

DESCRIPTION OF CONNECTED ACTIONS

As defined in the BLM NEPA Handbook (H-1790-1) Section 6.5.2.1 (page numbers 45–48) established by Permanent Instruction Memorandum (PIM 2018-023), connected actions are

> those proposed Federal actions that are "closely related" and "should be discussed" in the same NEPA document (40 CFR 1508.25 (a)(1)). Proposed actions are connected if they automatically trigger other actions that may require an environmental impact statement; cannot or will not proceed unless other actions are taken previously or simultaneously; or if the actions are interdependent parts of a larger action and depend upon the larger action for their justification (40 CFR 1508.25 (a)(1)). Connected actions are limited to Federal actions that are currently proposed (ripe for decision). Actions that are not yet proposed are not connected actions but may need to be analyzed in the cumulative effects analysis if they are reasonably foreseeable.
>
> If the connected action is also a proposed BLM action, we recommend that you include both actions as aspects of a broader "proposal" (40 CFR 1508.23), analyzed in a single NEPA document. You may either construct an integrated purpose and need statement for both your proposed action and the connected action, or you may present separate purpose and need statements for your proposed action and the connected action. Regardless of the structure of the purpose and need statement(s), you must develop alternatives and mitigation measures for both actions (40 CFR 1508.25(b)), and analyze the direct, indirect, and cumulative effects of both actions (40 CFR 1508.25(c)).

None of the past, present, and reasonably foreseeable future coal leasing actions described in Section 3.1.2 are considered connected actions to the Proposed Action analyzed in this EA for reasons described below.

- UEI SITLA coal lease – This action is not a connected action because the SITLA coal leases have already been granted to UEI and the mining of this leased coal does not rely upon leasing or mining of the Lila Canyon Mine.
- Williams Draw LBA – This action is not a connected action because the leasing or mining of the Williams Draw tract is not reliant upon approval of the proposed lease modifications.
- Walker Flat LBA – This action is not a connected action because the operation of the Bronco Mine is not reliant upon the Lila Canyon Mine or the leasing or mining of the Williams Draw tract.

PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Table C-1. Past and Present Actions – Lila Canyon Lease Modifications Resource Analysis Areas

Action	Location	Specific	Past, Present	Measure	Resource considered
Coal mining					
	Emery County	UEI - Lila Canyon Mine	Past, present	2019 production 3,664,000 tons	Energy production
		Canyon Fuel/Wolverine - Skyline #3 Mine	Past, present	2019 production 3,896,000 tons	Energy production
		Bronco - Emery Mine	Past, present	2019 production 694,000 tons	Energy production
		Castle Valley/Rhino Resources – Castle Valley #1 Mine	Past	(inactive since 2004)	N/A
		Castle Valley/Rhino Resources – Castle Valley #3 Mine	Past, present	2019 production 562,000 short tons	Energy production
		Castle Valley/Rhino Resources – Castle Valley #4 Mine	Past, present	2019 production 488,000 short tons	Energy production
		East Mountain Energy -Deer Creek Mine	Past	(inactive since 2016)	N/A
		Genwal/UEI - Crandall Canyon Mine	Past	(inactive since 2008)	N/A
		Genwal/UEI - South Crandall Canyon	Past	(inactive since 2007)	N/A
	Carbon County	UEI – Aberdeen Mine	Past	(inactive since 2009)	N/A
		UEI – Pinnacle Mine	Past	(inactive since 2007)	N/A
		Canyon Fuel/Wolverine - Dugout Canyon Mine	Past, present	2019 production 430,000 short tons	Energy production
		Hidden Splendor – Horizon Mine	Past	(inactive since 2013)	N/A
		Lodestar – Whisky Creek #1	Past	(inactive since 2004)	N/A
		West Ridge/UEI/ Murray – West Ridge Mine	Past	(inactive since 2016)	N/A
	Utah	Statewide	Past, present	2019 production 7,966,094 tons	
	New Mexico	Statewide	Past, present	2019 production 167,802,210 tons	
	Colorado	Statewide	Past, present	2019 production 6,992,221 tons	
	Wyoming	Statewide	Past, present	2019 production 48,404,660 tons	

Action	Location	Specific	Past, Present	Measure	Resource considered
Mineral mining					
	Emery County	Clay, humic shale, gypsum, U308&V205, boulders, riprap, gold, septarians, sandstone, flagstone, bentonite/zeolite	Past, present	Total 21 active mines; four are large mining operations, 17 are small mining operations or lode claims. The nearest active mine is approximately 19 miles northwest of Lila Canyon Mine.	Minerals
	Carbon County	Sandstone	Past, present	Total 1 active mine	Minerals
Oil and gas production					
	Emery and Carbon Counties	Oil Natural gas	Past, present	See EA Table 3-20	
	Utah	Oil and natural gas statewide	Past, present	13,835 producing wells in 2019; 38.4 MMT annual CO_2e	GHG, climate change
Other					
	Emery and Carbon Counties	Coal-fired power plants	Past, present	Emissions contribute to affected environment conditions. No new coal-fired generators have been built in Utah since 1993 (EIA 2020).	Affected environment; air quality; GHG, climate change; indirect effects of combustion

Table C-2. Reasonably Foreseeable Future Actions in the Lila Canyon Lease Modifications Resource Analysis Areas

Action	Location	Specific	RFFA	Measure	Resource considered
Coal mining					
	Emery County	UEI Williams Draw LBA	RFFA	Approximately 32 million tons recoverable coal; permitted maximum production 4.5 million TPY	Air quality Socioeconomics Water resources
		SITLA coal lease	RFFA	Approximately 4–5 million tons recoverable coal	Air quality Socioeconomics Water resources
		Walker Flat LBA	RFFA	Approximately 8.2 million tons recoverable coal as stated in the application	Socioeconomics
		Canyon Fuel/Wolverine Little Eccles LBA	RFFA	(approx. 80 km away from Lila Canyon Mine)	None (located outside resource analysis areas)
Mineral mining					
	Emery County	Chalk Hills Expansion	RFFA	Active mining disturbance ≤ 10 acres at any given time over nearly 40 years; DOGM permit required prior to mining in expansion area	Air quality Socioeconomics

Action	Location	Specific	RFFA	Measure	Resource considered
Oil and gas leasing/production					
	Carbon and Emery Counties	Quarterly oil and gas lease sales	RFFA once APD process is completed	Production, once operating	Socioeconomics
		IACX Woodside Dome 1 APD	RFFA once APD process is completed	Production, once operating	Air quality Socioeconomics
		Twin Bridges Bowknot Helium	RFFA once APD process is completed	Production, once operating	Socioeconomics
	Carbon County	EnerVest Peters Point APDs	RFFA once APD process is completed	Production, once operating	Socioeconomics (outside 50 km for air quality analysis)
Transportation					
7-County Coalition	Carbon County	Uinta Basin Railway	RFFA		None (located outside all resource analysis areas)
Other					
	Emery County	E Carbon junction fiber	RFFA	Temporary disturbance, socioeconomic effect	Air quality Socioeconomics

APPENDIX D

Excerpts from 2020 BLM GHG and Climate Change Report

3.0 Emissions Calculations

This document contains several emissions estimates for the three primary GHGs of concern (CO_2, CH_4, N_2O) at various scopes (direct and indirect) and scales (state and cumulative). The estimates provide a baseline to contrast federal emissions with those of the broader economy (national and global) and illustrate the degree to which federal mineral development contributes to projected energy use and climate change.

For the purposes of this report, the BLM is estimating both direct and indirect GHG emissions from federal fossil fuel production and consumption. The term *direct* is used here to describe development- and production-related emissions (i.e., upstream) that could be considered the most applicable or attributable to the purview of the BLM's authority for onshore federal mineral estate management. Direct emissions could result from broad resource use activities such as lease exploration, access roads, well pad or coal mine development, well drilling and completions, recurring maintenance and production equipment operations, and site reclamation. The term *indirect* is used here to describe emission elements that are outside of the BLM's oversight authority, such as midstream infrastructure development and maintenance, transportation and distribution, processing and refining, and the ultimate end use (including combustion) of any federal minerals produced. The sum of direct and indirect GHG emissions account for each stage of federal mineral production and use, which is also known as a life-cycle assessment (LCA).

To estimate emissions the BLM is using production data and statistics from the Energy Information Administration (EIA) and the Office of Natural Resources Revenue (ONRR), both of which provide production accounting services for domestic fossil fuel minerals. The production values used in this report are the extracted or gross withdrawn volumes, as reported on a calendar year basis. All end-use emissions are being estimated using EPA emissions factors from Appendix Tables C-1 and C-2 of 40 CFR Part 98, Subpart C, as shown in Table 2 below.

Table 2 - Downstream Combustion Emissions Factors

Fuel Stock	CO_2	CH_4	N_2O	CO_2e [2]	% CO_2	% CH_4	% N_2O
Crude Oil (kg/gallon) [1]	10.29	4.1E-04	8E-05	10.33	99.62	0.14	0.23
Natural Gas (kg/scf)[1]	0.05444	1.03E-06	1E-07	0.05451	99.88	0.07	0.06
Bituminous Coal (kg/ton)[1]	2,325.47	0.274	0.04	2,347.23	99.07	0.42	0.51

[1] Equivalent EFs: EPA GHG Emissions Factors.
[2] CO2e values calculated from AR5 GWPs (100-year w/climate feedbacks).

The reported production data serves as the primary input for the delineation of direct and indirect emission estimates by applying published LCA data, other studies and statistics, and assumptions for each fossil fuel type as follows:

Coal

Virtually all of the coal produced in the U.S. is classified as either thermal (steam coal) or metallurgical (met or coking coal). Steam coal has a variety of energy-related uses in several sectors of the economy, including as a primary fuel for baseload electrical generating plants. Met coal is used (indirectly, as coke) as a fuel and reactant in steel production blast furnaces.

Regardless of classification, the BLM is unaware of any non-combustion base uses for coal stocks beyond trivial scales and is thus assuming 100% combustion of all coal production.

To estimate the LCA emissions associated with federal coal production in the U.S., this report is relying on data obtained from a recent BLM-sponsored study that examined coal mine emissions in four western states that represent a majority of the federal coal estate. The study examined various production metrics of operational mines (underground and surface) in each state to evaluate the GHG emissions profiles for extraction, processing, venting, transport, and end-use (combustion). An analysis of the study data suggests that the cradle-to-gate emissions from mining activities (direct emissions) and coal transport are approximately 3.072% of the relative combustion emissions (carbon dioxide equivalent [CO_2e] basis) as a function of production. The results of the BLM study are consistent with other external data sources researched[3] in preparation for this report, and as such the data is deemed reasonable for estimation purposes.

Natural Gas

Natural gas stocks are used as an energy source (via combustion) in virtually every sector of the economy. The industrial sector also uses natural gas as a raw material to produce chemicals, fertilizer, and hydrogen. However, most of the processes that support the chemical transformation of CH_4 (natural gas) into these products generate a stoichiometric amount of CO_2 emissions relative to the mass of the feedstocks used in the process. And so for the purposes of this report, the BLM is assuming that any products made from natural gas feedstocks would release GHGs equivalent to a combustion rate.

To account for the LCA emissions associated with natural gas production, the BLM is relying on data published by the Department of Energy's National Energy Technology Laboratory (DOE-NETL) in a report titled *Life Cycle Analysis of Natural Gas Extraction and Power Generation*[4]. The NETL report provides a detailed examination of the natural gas supply chain in the U.S. broken down by basin and resource type. The calculations in this report are based on the national averages published in the NETL report, as these values provide a reasonable estimation of emissions based on the fractions of production the representative federal basins contribute to total U.S. production (see Exhibits 2-2, 2-3, and 6-6). The report concludes that the average life-cycle GHG emissions from the U.S. natural gas supply chain are 19.9 grams (g) of CO_2e per megajoule (MJ) of delivered (i.e., combusted) natural gas. The CO_2e factors in the NETL report are based on 100-year AR5 estimates with climate feedbacks. The report also concludes that total CH_4 emissions throughout the supply chain are approximately 1.24% of the production volume (see Exhibit 6-2). The loss of gas throughout the supply chain represents a reduction of the available gas that could be combusted by the same fraction, and so for accounting purposes the BLM is assuming a combustion rate of 98.76% of all production volumes. The national average CH_4 emissions from the supply chain are estimated to account for approximately 11.15% of the total LCA CO_2e contribution. In terms of emissions speciation, CH_4 alone accounts for 7.848 g CO_2e/MJ (0.218 g CH_4/MJ) of the total supply chain CO_2e factor. The BLM is assuming that 100% of the production, gathering, and boosting emissions from the supply chain processes are a part of the direct emissions scope from federal production. The direct emissions of CO_2 and CH_4 from the federal production supply chain are estimated to be 6.052 g/MJ and 0.131 g/MJ, respectively.

Exhibit 2-2. Basins that Account for Majority of U.S. Natural Gas Production



Exhibit 2-3. Natural Gas Production Shares by Well Type and Geography

Geography	Well Type						
	Conventional	Shale	Tight	CBM	Offshore	Associated	Total
Onshore Production							
Anadarko	2.2%	2.6%	1.7%				6.5%
Appalachian		29.0%					29.0%
Arkla	0.4%	4.2%	1.4%				6.0%
Arkoma	0.3%	0.9%					1.2%
East Texas	1.6%	1.3%	1.3%				4.2%
Fort Worth Syncline		1.8%	0.0%				1.8%
Green River	1.6%		3.9%				5.5%
Gulf Coast	0.8%	6.6%	1.3%				8.7%
Permian	2.3%	5.3%					7.6%
Piceance			0.3%				0.3%
San Juan	1.4%			1.9%			3.3%
South Oklahoma		1.0%					1.0%
Strawn		3.2%					3.2%
Uinta	0.5%		0.8%				1.3%
*Subtotal: Onshore**	*11.0%*	*56.0%*	*10.6%*	*1.9%*			*79.6%*
Offshore Production							
Offshore Gulf of					4.2%		4.2%
Offshore Alaska					0.1%		0.1%
Subtotal: Offshore					*4.3%*		*4.3%*
Associated-Dissolved Gas							
United States						16.1%	16.1%
Total							
*Total**	*11.0%*	*56.0%*	*10.6%*	*1.9%*	*4.3%*	*16.1%*	*100%*

Exhibit 6-6. Life Cycle GHG Emissions for Natural Gas Scenarios (100-year CO_2e)

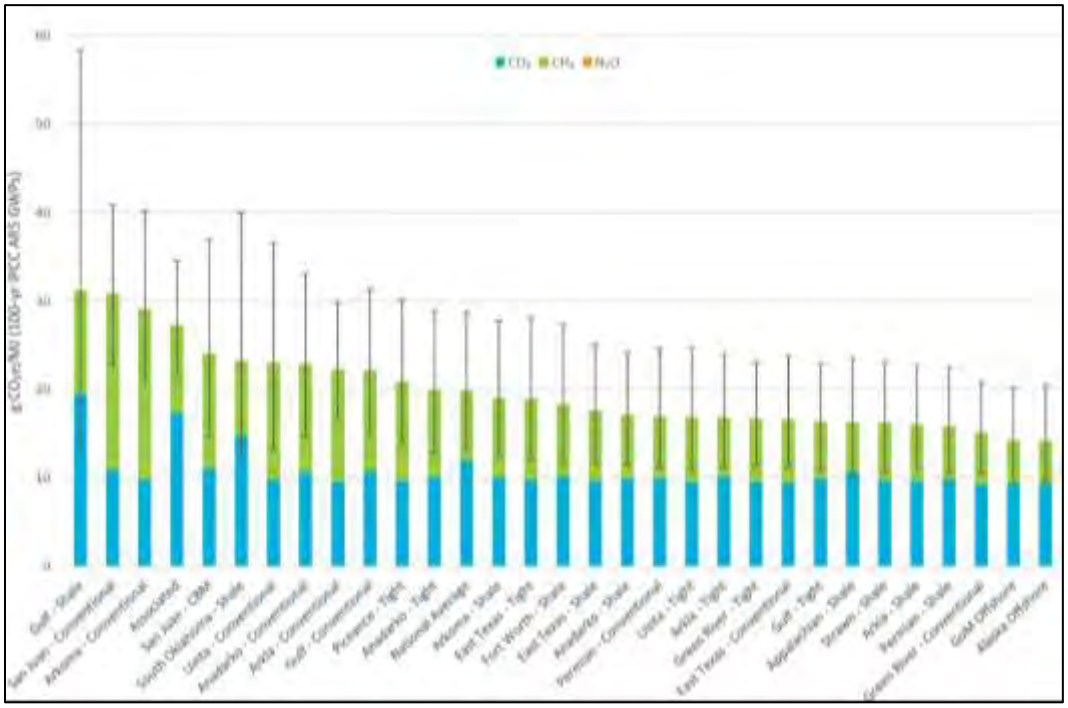


Exhibit 6-1. Life-Cycle GHG Emissions for the U. S. Natural Gas Supply Chain

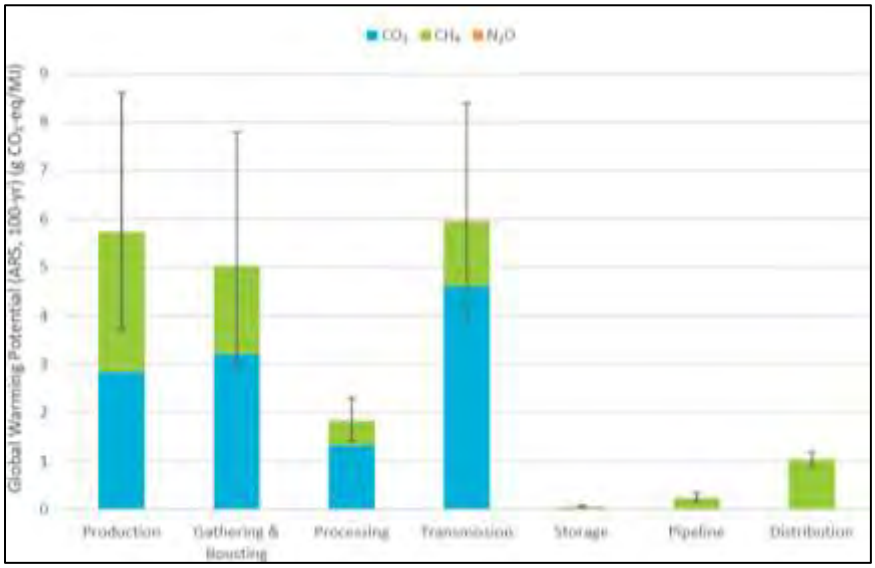


Exhibit 6-2. Life-Cycle CH_4 Emissions for the U.S. Natural Gas Supply Chain

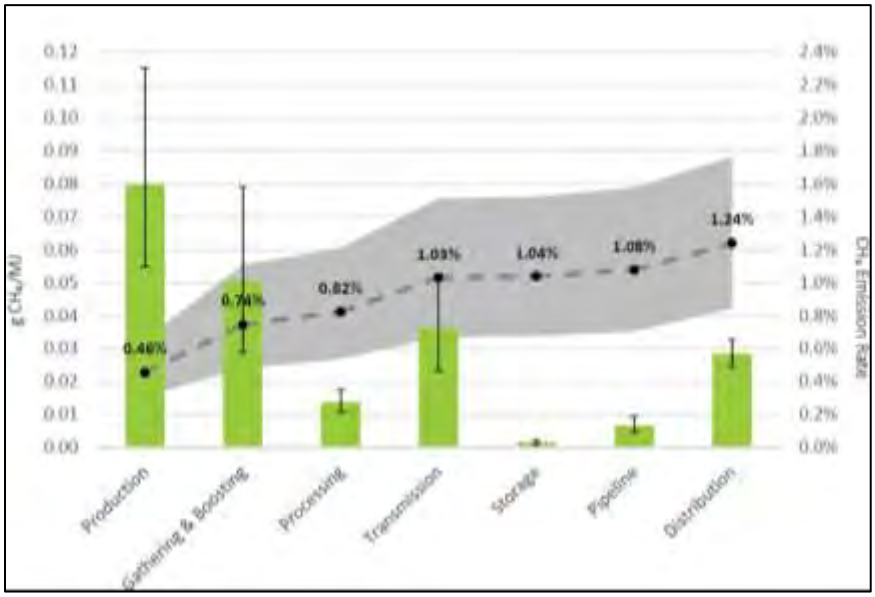


Figure 1 - NETL Natural Gas LCA Data

Petroleum

EIA data show that approximately 95% of oil stocks in the U.S. are transformed into fuels, while the remainder is refined to produce a range of petrochemical products such as plastics and other consumables. The refining process requires additional feedstocks to be blended with the crude oil in order to make the chemistry work, meet regulatory requirements, or yield the desired product profiles. Because of the additives and the fact that most of the products refineries produce are less dense than the crude oil stock, the output volume is greater than that of the initial crude stocks by approximately 5%. This gain, formally known in the industry as process gain, means that the percentage of crude oil stocks used to produce combustible products is essentially equivalent to the original produced crude oil volumes, and so for the purposes of this report, the BLM is assuming a 100% combustion rate for crude oil production.

To account for the methods and infrastructure used to produce and market crude oil products, this report relies on published data produced in part by the DOE-NETL, which updates its 2005 well-to-wheels (WTW) life-cycle GHG analysis of petroleum-based fuels consumed in the U.S.[5]The update focuses on three primary products derived from crude oil—gasoline, diesel, and jet fuel—which, according to the EIA, account for approximately 83% of the potential crude oil stock uses in the U.S. To estimate crude oil life-cycle emissions from the reported production volumes, the BLM is calculating a weighted average of NETL's updated modeled LCA emission factors as derived from the EIA product percentages. Table 4 shows the LCA emissions factors and the derived weighted fraction factors applied in this report. The LCA combustion data is shown and used to calculate the relative percentages the other life-cycle process emissions represent relative to combustion.

Table 4 - Petroleum Life-Cycle CO2e Emissions[1]

Data / Product	Gasoline	Jet Fuels		Diesel	Sums / Weighted Fractions	Scope
EIA Product Fractions[2]	0.49	0.09		0.25	0.83	NA
NETL Production	13	13		13	13	Direct
NETL Refining	10.7	2.3		6.8	8.61	Indirect
NETL Transport	1.7	1.6		1.6	1.66	Indirect
NETL Combustion	72.7	73.7		72.7	72.8	Indirect
NETL Total LCA	98.1	90.7		94.1	96.1	NA

[1] NETL LCA emissions units are g CO_2 e/MJ combusted
[2] 2019 U.S. refiner & blender net production fractions

The direct emissions of CH_4 from the petroleum life-cycle systems are assumed to be equivalent to the estimates used for the natural gas systems on a per unit of energy produced basis. This assumption is based in part on the fact that oil wells often produce associated gas along with the liquid hydrocarbons. While the associated gas itself is accounted for in the overall natural gas production data, there are known emissions points within the liquids process streams that could leak CH_4 dissolved in crude oil, such as tanks, pneumatic devices, components, pipelines, etc. Given the inherent variability in the equipment configurations, age, and regulatory requirements applicable to the liquids infrastructure in the U.S., the equivalence assumption, while likely conservative, is reasonable for the purpose of estimating emissions in this report. Further, there was virtually no data that the BLM could find to estimate CH_4 emissions from just the liquids alone (i.e., without the gas context). The assumption is only valid for the direct emissions portion of the life-cycle due to the different processes used to manage a liquid versus a gas in the indirect portions of the process streams. To calculate the energy equivalence of the reported production, the BLM is using published energy data from the above-referenced Part 98 tables for oil (1 barrel of crude oil = 5,796,000 Btu) and gas (1 cubic foot of natural gas = 1,026 Btu).

The LCA data presented in this report is meant to broaden the analysis of the potential direct emissions that could result from the BLM's federal mineral management mission. It is important for readers to understand that the impacts analysis presented in this report is almost entirely based on the end-use (i.e., combustion) emissions, which fully account for all of the fossil fuels available to the economy for primary energy purposes. It would be inappropriate to add the LCA emissions from direct or indirect processes that rely on fossil fuels to the end-use estimates, as this would result in double counting and would bias the impacts assessment. The only exception to this rule is for the accounting of system losses of CH_4 from the oil and gas supply chain and coal mine CH_4, as these gases are never combusted. The loss estimates of CH_4 from processes related to the direct emissions scope are designated as LCA CH_4 in the tables below.

The LCA CH_4 emissions are transformed by the applicable GWP and then added back in to the combustion-related totals to present the total CO_2e estimates used to make projections and impacts assessments discussed later in the report.

Note: Production data from the above-referenced sources is subject to periodic revisions. Necessary corrections required for static data elements in this report will be made during subsequent year updates.

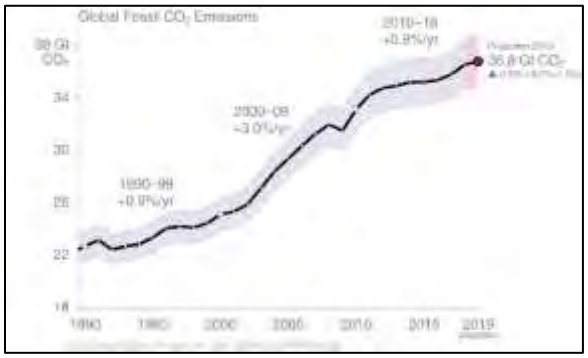
4.0 GHG Emissions Trends

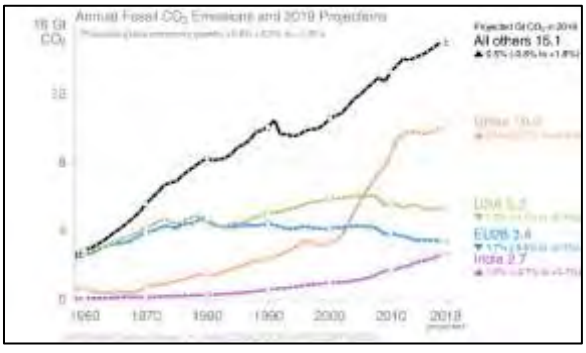
Despite global awareness and acknowledgment of the climate change issue, 2019 saw a continuation of record-setting emission rates around the world. Modernization, population growth, and standard of living advances have all contributed to increased energy demand that, combined with land use changes on balance, have led to higher emissions year after year. According to the Global Carbon Project, cumulative CO_2 emissions from fossil fuels were estimated to have reached 36.8 Gt in 2019. This value is equivalent to 10.04 petagrams of carbon (PgC) and most closely tracks the RCP4.5 Fossil Fuel scenario relative to the 2020 emissions year. In the atmosphere, 10.04 PgC is approximately 4.71 ppmv of CO_2, but because of the Carbon cycle, not all of the CO_2 emissions will remain the atmosphere.

The largest single emitter in 2019 was China (28%) followed by the U.S. (14.4%). While China reached a new high for its annual rate, the U.S. remained below the high emissions mark set in 2007 and has been trending somewhat flat for the last decade. The U.S. is by far one of the largest single emitters on a per capita basis, although this trend has been mostly declining over the past two decades. Globally, the use of all fossil fuels continues to increase, where each fuel (and cement production), save for coal, hit new peak emissions levels based on the most recent data available.

The large increases in global coal emissions can mostly be attributed to China, while in the U.S., emissions from this fuel continue to decline at a rapid rate due in part to the competitiveness of natural gas and renewable sources of energy. In the U.S., only natural gas emissions reached a new high mark in 2019. Oil remained below its historical high, but the trend has been increasing year after year for the past 5+ years.

In terms of sector use, heat and electricity accounts for almost half of global fossil fuel GHGs, led by coal fuels. Coal accounts for 73% of heat and electricity emissions and approximately 50% of all industrial emissions. Oil is the dominant fuel of choice in the transportation sector and accounted for close to 97% of the associated emissions. Natural gas is used broadly across all sectors of the global economy and has increasing use rates in each category analyzed.





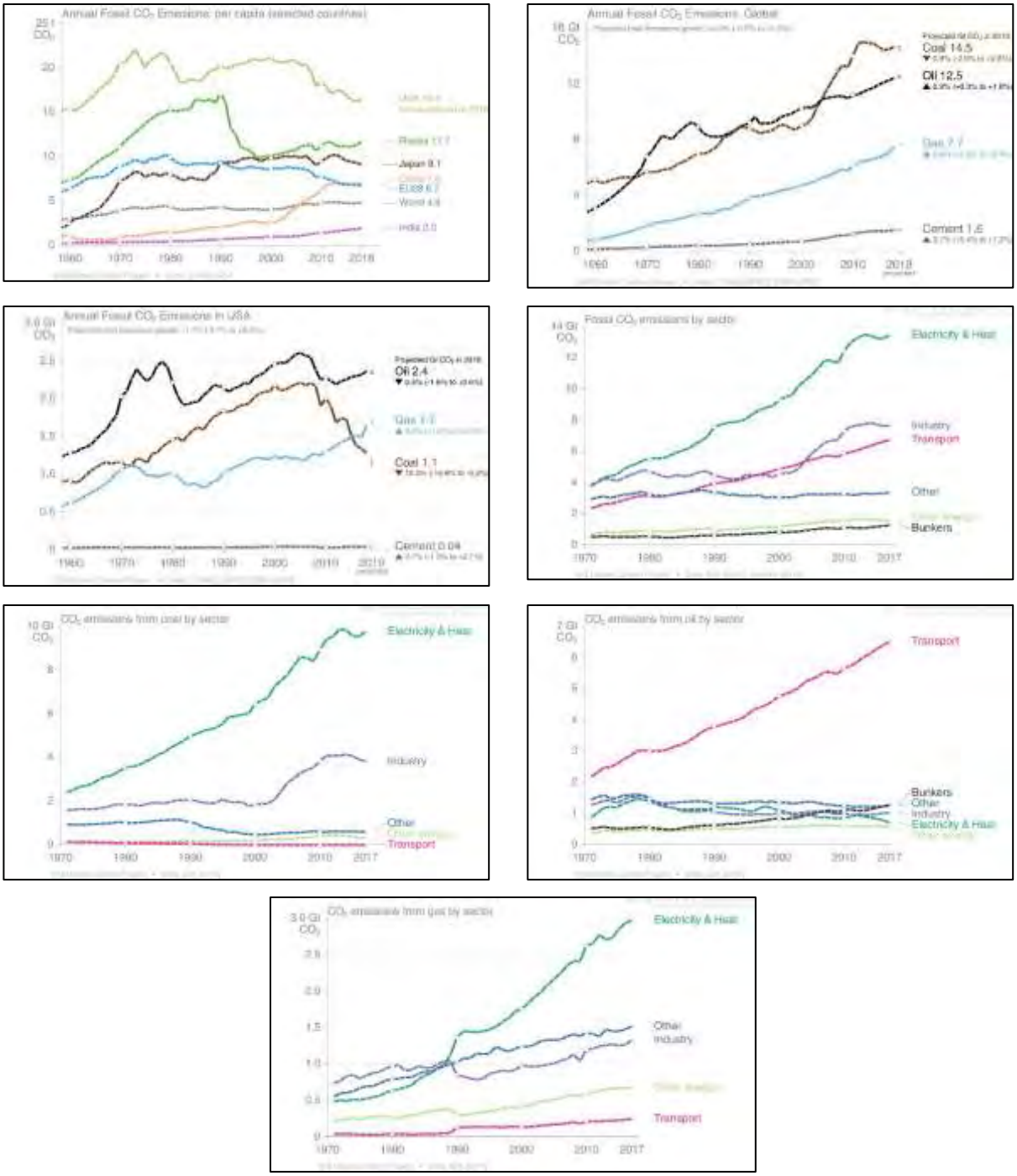


Figure 2 - Global Fossil Fuel Energy Emissions

Domestic Energy and Emissions

According to the latest EPA Greenhouse Gas Inventory Report, in 2018 the U.S. emitted a total of approximately 6,676.65 million metric tons (MMT) of GHGs on a CO_2e basis. CO_2 alone accounted for 81.3% (5,424.88 MMT) of the total emissions, of which energy-related sources emitted 5,249.29 MMT

(96.7%). $CH_4$and NO_2 were the next two largest components of the U.S. emissions spectrum at 9.5% (634.46 MMT) and 6.5% (434.53 MMT), respectively. Energy-related sources accounted for 253.91 MMT (39.1%) and 44.01 MMT (9.9%) of all CH_4 and N_2O emissions on a CO_2e basis, respectively. Together, emissions of all three gases from the energy sector represent approximately 83.1% of all GHGs emitted in the U.S. More sector-specific emissions data can be found on the EPA's Greenhouse Gas Inventory Data Explorer.

On a cumulative basis, the EPA data show that since 1990 the U.S. has emitted approximately 202,283 MMT of CO_2e, at an annual average rate of 7,152.96 MMT. The most recent year emissions data is less than the annual average but remains relatively little unchanged over the last 30 years. However, as stated above, the per capita emissions rate changes show that the U.S. has very much decreased its overall energy use intensity over the past 20 years. According EIA, the annual energy consumption in the U.S. for 1990 was 84.41 quads (quadrillion British thermal units), while in 2019 it was 100.2 quads, which represents an overall increase in energy demand of approximately 15%. The relative energy mix over this same period of time shows a decline in coal of -7.86 quads, while consumption in every other energy category increased (gas +12.5 quads, oil +3.22 quads, nuclear +2.36 quads, renewables +5.42 quads). Although a single snapshot year comparison does not provide the full narrative for the economic dynamics that occurred to result in the fuel use changes over the cumulative period, the data does help to provide a sense of why the U.S. emissions remain relatively flat as tracked. It is clear from the data that increases in energy use efficiency, fuel substitutions, and renewable energy resource development have all combined to offset emissions from the net energy demand increases that have occurred over the same time frame. In terms of energy supply (see Figure 3), the 2019 production data show natural gas provides almost as much energy as petroleum and coal combined. The data also show that on a per unit of energy basis, natural gas is the least-climate-polluting fossil fuel (60.75 MMT/quad) compared to coal (95.89 MMT/quad) and petroleum (83.14 MMT/quad).

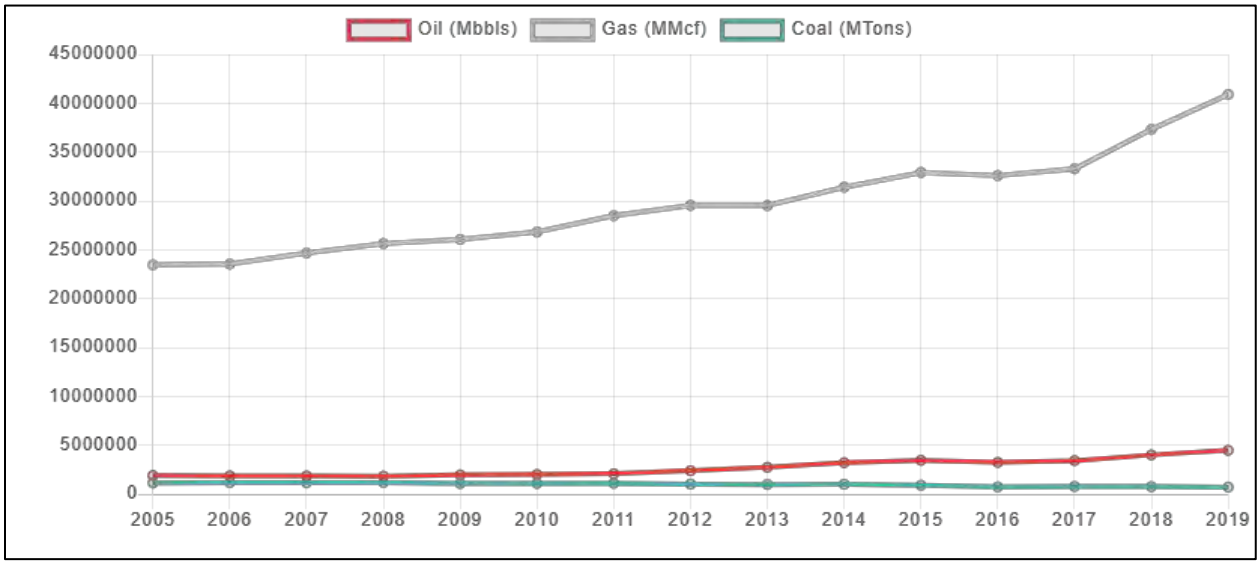
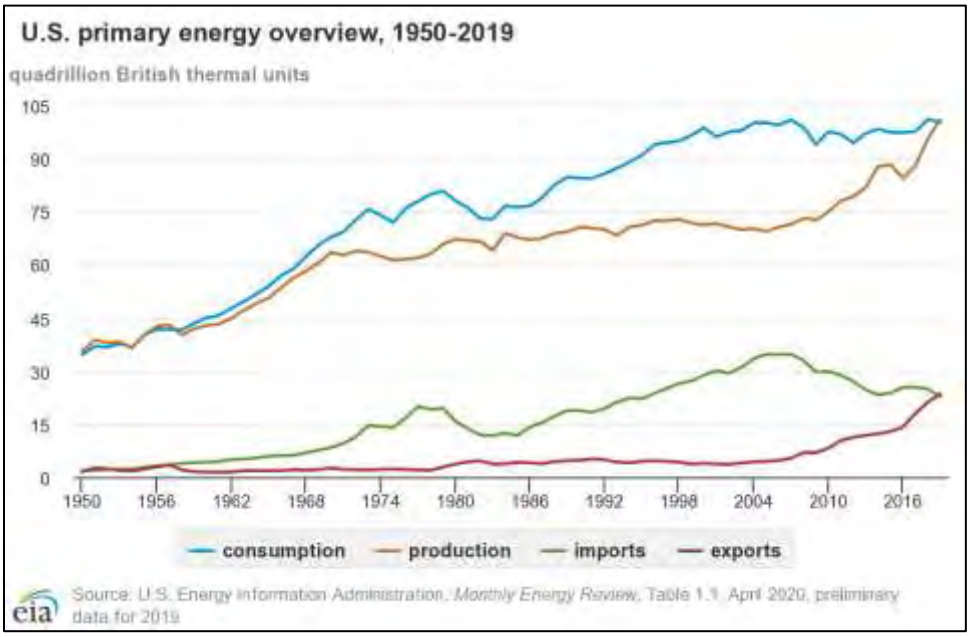
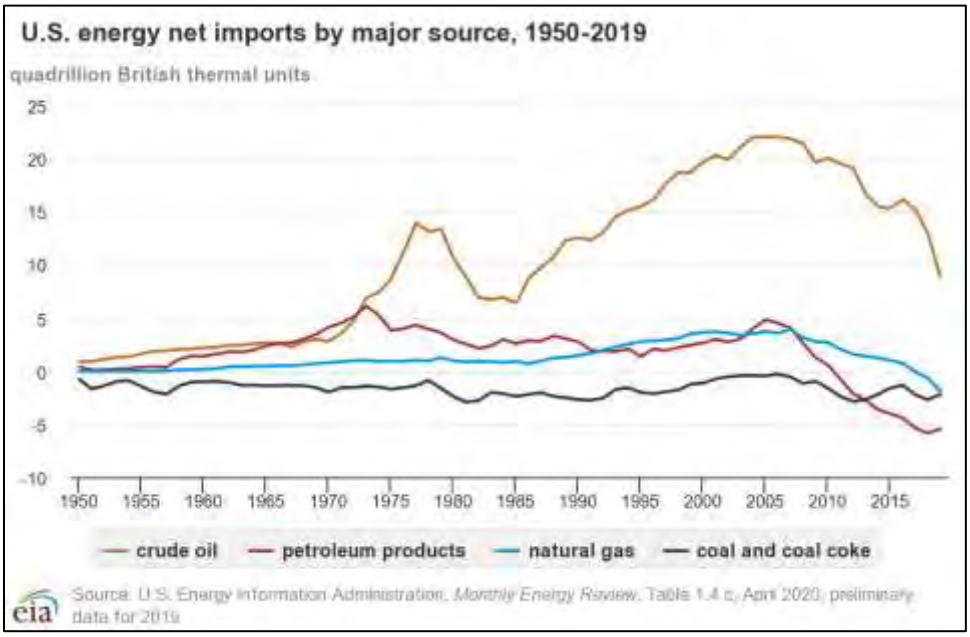
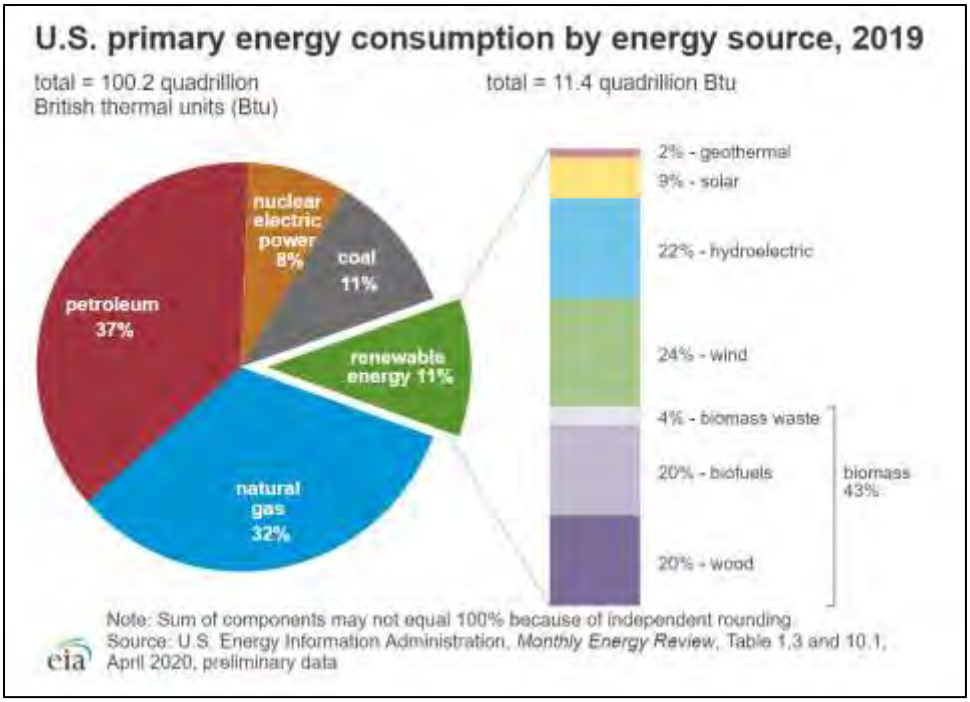


Figure 3 - Domestic Energy Statistics (undefined)

The latest EIA data also show that in 2019 the U.S. became a net energy exporter for the first time in almost 70 years. Crude oil remains the only source of fossil fuel energy that is imported, and these volumes have been mostly declining since 2005. The three major fossil fuels—petroleum (37%), natural gas (32%), and coal (11%)—combined accounted for about 80% of domestic consumption while renewable energy sources (12%) and nuclear electric power (8%) provide the remainder. The year 2019 also marks the first time that consumption of renewable sources of energy surpassed coal in the marketplace. The electrical grid (including energy losses) is in a virtual tie with the transportation sector as the largest source of energy consumption in the U.S., followed by industrial, residential, and commercial uses.







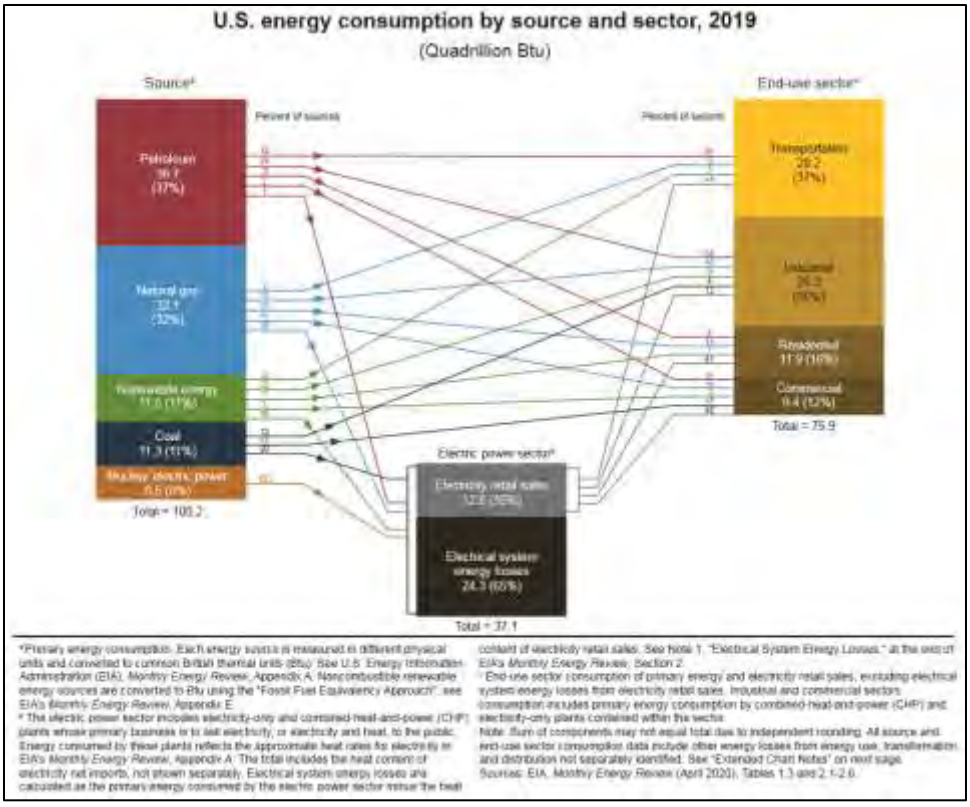


Figure 4 - Domestic Energy Consumption, Net Imports, and End Use

Domestic energy supplies of fossil fuel minerals can generally be classified as either federal or non-federal, where non-federal signifies state, local, private, or corporate ownership. The BLM manages the onshore federal mineral estate on behalf of the public and in accordance with numerous laws, regulations, and policies to provide for the nation's energy security and to help meet the demand for energy domestically and abroad. The data tables below show production and emissions data for each mineral type by region. All regions other than U.S. Total represent federal minerals only. The Onshore designation is used to account for all other onshore federal minerals produced in states not explicitly represented by the regions listed in the tables. The % Total and % Federal columns in the production tables are based on the averages of the full 5 years of data presented.

Table 5 - Coal Production Trends (tons) [1]

Region	2015	2016	2017	2018	2019	% Total	% Federal
U.S. Total	896940563	728364498	774609357	756167095	706309263	100%	NA
CO	17124505	10614645	10392779	10620675	10336903	1.53%	3.7%
MT	19063920	13884403	18023605	17626988	15631137	2.18%	5.28%
NM	7657220	4914843	5956595	1754306	3775959	0.62%	1.51%
ND	5261915	4738941	4348995	3849247	4039635	0.58%	1.39%
UT	11364222	12252873	12933852	11051690	12791486	1.56%	3.78%
WY	314632155	244846641	273653181	265503330	244041373	34.76%	84.14%
Onshore	636458	692831	764815	516732	543138	0.08%	0.2%

[1] Federal coal accounts for 41.3% of all U.S. production on a 5-year annual average basis.

Table 6 - Natural Gas Production Trends (Mcf) [1]

Region	2015	2016	2017	2018	2019	% Total	% Federal
U.S. Total	32914647000	32591578000	33292113000	37325539000	40892458000	100%	NA
AK	16642097	14663058	16039628	15315663	18449816	0.05%	0.36%
CA	13291040	12611640	11839226	11918118	6004674	0.03%	0.25%
CO	664983322	626680566	644465321	637440829	664233004	1.83%	14.44%
MT	14119762	12607237	12287580	11627948	10951038	0.03%	0.27%
NM	800540964	786765900	799943219	920956001	1046481774	2.46%	19.42%
ND	41974682	47169787	60564817	73674266	88968419	0.18%	1.39%
UT	264663369	227501512	190401286	164202446	148254680	0.56%	4.44%
WY	1537216372	1438798196	1402608212	1402654935	1255059059	3.97%	31.38%
Onshore[2]	107790704	96272937	96818377	90803086	98688229	0.28%	2.19%
Offshore	1354149051	1256774957	1111100538	1020510066	1058788351	3.28%	25.87%

[1] Federal gas accounts for 12.7% of all U.S. production (including offshore) on a 5-year annual average basis.
[2] Onshore alone accounts for 9.4% of all U.S. gas production on a 5-year annual average basis.

Table 7 - Crude Oil Production Trends (bbl) [1]

Region	2015	2016	2017	2018	2019	% Total	% Federal
U.S. Total	3447970000	3239657000	3420545000	4001892000	4470528000	100%	NA
AK	958054	805788	993799	1033904	1280423	0.03%	0.12%
CA	13421932	11013188	9795602	9504080	9292324	0.29%	1.26%
CO	5028374	4362350	5194434	6822327	6992221	0.15%	0.68%
MT	3294381	3028077	2859730	3368258	3180317	0.08%	0.37%
NM	79464456	76824847	89069273	129250843	167802210	2.92%	12.9%
ND	26666226	25855361	31143984	38720115	44509644	0.9%	3.97%
UT	11463564	9337508	9160104	8155747	7966094	0.25%	1.1%
WY	44402275	37716663	39030469	43960807	48404660	1.15%	5.08%
Onshore[2]	2782516	2690002	2462480	2207843	2331383	0.07%	0.3%
Offshore	565024682	592505843	619871829	647366375	695553235	16.79%	74.22%

[1] Federal petroleum accounts for 22.6% of all U.S. production on a 5-year annual average basis.
[2] Onshore alone accounts for 5.8% of all U.S. petroleum production on a 5-year annual average basis.

Report year (2019) emissions for the production data disclosed above are shown in Table 8. The table shows indirect combustion (Comb) emissions of CO_2 and CO_2e, direct emissions of CH_4 (LCA CH_4), direct LCA emissions from extraction (Extract), indirect LCA emissions from transportation and distribution (Trans), and indirect LCA emissions from processing, refinement, and transformation (Process). The Total CO_2e column is the sum of the combustion CO_2e and LCA CH_4 (as CO_2e) columns and is the metric used for impacts assessments later in the report.

Table 8 - Report Year Emissions (MMT) [2]

Region	Comb CO_2	Comb CO_2e[1]	LCA CH_4	Extract CO_2e	Trans CO_2e	Process CO_2e	Total CO_2e
U.S. Total	5772.48	5826.5	16.4415	1060.19	315.72	370.42	6418.4
AK	1.55	1.57	0.0036	0.32	0.13	0.13	1.69
CA	4.34	4.36	0.0083	0.79	0.13	0.5	4.66
CO	63.22	63.5	0.112	11.75	4.47	2.65	67.54
MT	38.32	38.67	0.0225	5.63	0.29	0.2	39.48
NM	138.25	138.7	0.2872	26.47	8.44	12.22	149.04
ND	33.46	33.64	0.0531	5.85	1.06	2.59	35.55
UT	41.26	41.56	0.0425	6.65	1.18	0.92	43.09
WY	656.74	662.23	0.5043	100.33	11.42	6.81	680.39[3]
Onshore	7.64	7.66	0.0165	1.51	0.66	0.46	8.25
Offshore	358.14	359.48	0.7073	66.23	13.7	39.34	384.94

[1] Comb CO_2e includes combustion related emissions of CH_4 and N_2O as CO_2e using AR5 GWPs values w/CF.
[2] Federal emissions are approximately 22% of the U.S. Total shown (16% for Onshore only).
[3] WY alone accounts for nearly half of all federal emissions, which is largely driven by coal (86%).

Table 9 - Mineral Summary Report Year Emissions (MMT) [2]

Region	Comb CO_2	Comb CO_2e[1]	LCA CH_4	Extract CO_2e	Trans CO_2e	Process CO_2e	Total CO_2e
Fed. Total Coal	5772.48	5826.5	16.4415	1060.19	315.72	370.42	6418.4
Fed. Total Gas	1.55	1.57	0.0036	0.32	0.13	0.13	1.69
Fed. Total Oil	4.34	4.36	0.0083	0.79	0.13	0.5	4.66

1 Comb CO_2e includes combustion related emissions of CH_4 and N_2O as CO_2e using AR5 GWPs values w/CF.
2 All emissions in table 9 are onshore federal.

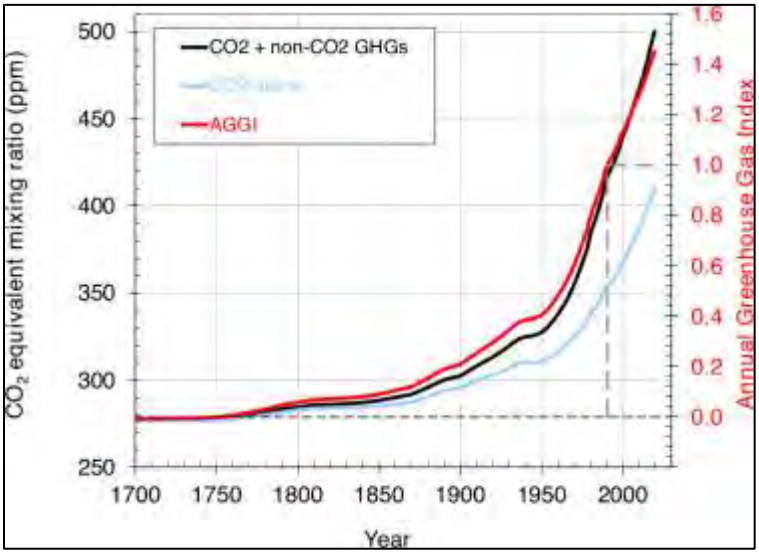


Figure 6 - Climate Feedbacks and AGGI

7.0 Projected Emissions

Climate change is fundamentally a cumulative issue with global scope, and all GHGs contribute incrementally to climate change regardless of scale or origin. The multitude of interwoven natural systems and feedback mechanisms that contribute to climate variability over the entirety of the Earth makes analysis of this issue exceptionally complex. Climate scientists provide for analysis by modeling changes to these systems in response to a range of global emissions scenarios known as Representative Concentration Pathways (RCPs). RCPs are not fully integrated scenarios of climate feedback, policy, emissions limits, thresholds, or socioeconomic projections but rather a consistent set of cumulative emissions projections out to year 2100 of only the components of radiative forcing that are meant to serve as input for climate and atmospheric chemistry modeling. The following bullets describe the four primary pathways that climate scientists have used for assessment in numerous climate modeling studies.

- ***RCP2.6*** *- Very low emissions levels leading to peak in radiative forcing at 3.1 W/m2 by mid-century, returning to 2.6 W/m2 by 2100, where GHG emissions (and indirect* emissions of air pollutants) are reduced substantially over time. This pathway provides for an abrupt and

rapid decline in CO_2 emissions starting around 2020, with atmospheric concentrations of GHGs and subsequent radiative forcing stabilizing between 2040 and 2060. This scenario also provides for "negative emissions" starting in 2080, and essentially projects that more carbon is removed from the atmosphere than is emitted. The curve suggests that emissions from fossil fuels and other sources would decline by approximately 3.5% per year until 2040 and then continue at a pace of approximately 10% per year until the emissions become negative between 2070 and 2080. The cumulative emissions of this pathway are approximately 1,715.7 $GtCO_2e$ (2018–2100). CO_2 alone represents 54.2% of the total contributing emissions, and 81.5% of the total CO_2 emissions are attributable to fossil fuel use.

- ***RCP4.5*** *- Stabilization scenario where total radiative forcing is stabilized at 4.5 W/m2 before 2100 by employment of a range of technologies and strategies for reducing GHG emissions. This pathway forecasts global emissions will increase until about 2040, with actual stabilization occurring between 2030 and 2050. Starting in 2050, emissions would start to decline at rates commensurate with the 2.6 pathway until 2080, when emissions stabilize again through the end of the century. GHG concentrations and forcing would continue to rise through the end of the century, although the rate of increase diminishes significantly around 2070. Emissions of both CH_4 and N_2O are flat throughout the century and do not contribute significantly to additional radiative forcing. The cumulative emissions of this pathway are approximately 3,728.6 $GtCO_2e$ (2018–2100). CO_2 alone represents 67% of the total contributing emissions, and 98.2% of the total CO_2 emissions are attributable to fossil fuel use.*
- ***RCP6.0*** *- Stabilization without overshoot pathway with radiative forcing of 6 W/m2 after 2100 by employment of a range of technologies and strategies for reducing GHG emissions. Emissions of both CH_4 and N_2O are more or less stable throughout the century and do not contribute significantly to additional radiative forcing, while emissions of CO_2 grow steadily until 2080 before declining. The cumulative emissions of this pathway are approximately 5,380.2 $GtCO_2e$ (2018–2100). CO_2 alone represents 74.3% of the total contributing emissions, and 101.1% of the total CO_2 emissions are attributable to fossil fuel use. Please note that the land-use change (LUC) CO_2 emissions in this scenario are negative at about the mid-century mark, which produces data showing fossil fuel emissions that are greater than the total emissions (which include the negative LUC values).*
- ***RCP8.5*** *- Increasing emissions over time leading to very high GHG concentration levels and radiative forcing of 8.5 W/m2 in 2100. This pathway assumes emissions trajectories follow a historical growth curve and is representative of the high range of non-climate policy scenarios, or a worst-case scenario that assumes unabated emissions. The cumulative emissions of this pathway are approximately 9,227.7 $GtCO_2e$ (2018–2100). CO_2 alone represents 72.3% of the total contributing emissions, and 97.8% of the total CO_2 emissions are attributable to fossil fuel use. Given the recent and ongoing developments occurring globally, including market forces that are driving demand for sustainable energy solutions, public policy advancements (e.g., Paris Agreement), and the continuous communication of the issue, it is unlikely that this pathway would come to pass over the course of the remainder of the century.*

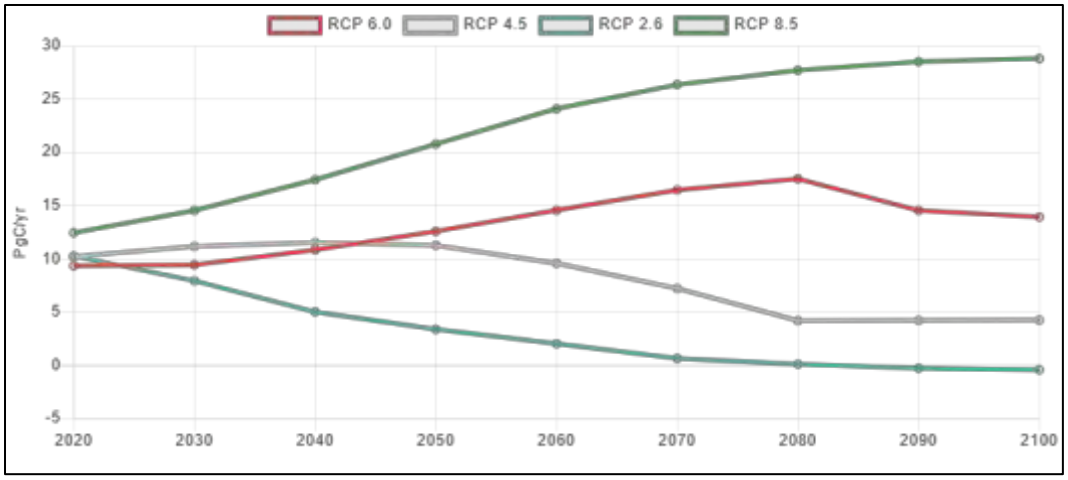


Figure 7 - RCP Projections – CO_2 Emissions (total)

Report Year Atmospheric GHG Concentrations: CO_2 (ppm) = 409.8, CH_4 (ppb) = 1858.4, N_2O (ppb) = 331.9

Current carbon dioxide concentrations are tracking at the lower end of the RCP data range relative to the 2020 year projections. However, the CH_4 and N_20) concentrations are closer to the upper end of the RCP range on the same relative basis.

Fossil Fuel Emissions Projections

There are a variety of ways to project emissions forward in time for the purpose of analysis. The availability of data, the projection time frame, and the nature of the action itself will often dictate the appropriate methodology (and corresponding assumptions) to be used. For example, reasonably foreseeable development scenarios (RFDs) have been prepared by the BLM Reservoir Group to try to forecast oil and gas growth in specific BLM field offices for a known basin or play based on a number of factors (estimated hydrocarbon potential, operator surveys, existing development trends, economic forecasts, basic geology, etc.). These documents typically provide for 20+ years of estimated oil and gas development and have traditionally been used to inform resource management plan development (as assumptions for analysis). The RFD documents are not intended to be a resolute prediction of development pace, or indicative of any potential development limit. Given the dynamics of the industry and the global nature of the hydrocarbon commodities markets, development in any single area does not exist in a vacuum and is subject to external influences that can render the best RFD outdated within a few years. As such, the BLM air resource specialists often find that these documents are unreliable predictors for the purposes of one-off impacts assessments and for determining prescriptive mitigation requirements over the entirety of a field office planning period. In more recent years, many of the specialists have been advocating for adaptive management based on iterative analyses of near real-time environmental factors, including emissions profile changes that are not reasonably foreseeable in more traditional planning assessments.

For the purposes of this report, the BLM is opting to provide two methods for projecting future GHG emissions based on a combination of internal statistics and the fossil fuel energy projections made by the EIA for its Annual Energy Outlook (AEO) report. Both methods rely on 5-year average datasets

(presented above and below) to smooth out potential annual variability that can arise for any number of reasons, not least of which the simple economics of energy supply and demand over any given period.

The first method uses the AEO projections for energy production across the nation to project forward the 5-year average trends for federal production and emissions outlined in Section 4.0. The major assumption of this scenario being that the ratio of federal and non-federal mineral production is fixed relative to the 5-year average going forward. The AEO explores a number of different energy projection scenarios, out to year 2050 based on varying assumptions about the economy, technology, and policy. The Reference case is the baseline scenario from which all other side case estimates are made. The Reference case examines a future where slower growth in consumption (energy efficiency increases in the U.S. economy) is contrasted with an increasing energy supply due to technological progress in renewable energy, oil, and natural gas. The combination of the federal trend data and AEO scenarios provide for a longer term reasonably foreseeable range of potential emissions given the known parameters (supply, demand, policy, technology, etc.) that exist today and potential alternative policies that would change the evolution of energy dynamics going forward. For the 2020 AEO, the High Economic Growth and High Oil Price scenarios produce the highest emissions per region depending on their resource mix. Regions with lower coal production see higher emissions from the High Oil Price scenario, while other states with a relatively modest mix of resource production see maximums from the High Economic Growth scenario (also highest for total federal). For all regions the $35 Carbon Fee case provides the lowest emissions.

The below AEO scenario shown is the reference scenario. The interactive version of this report provides a selection field with other economic and growth scenarios to view the projected emissions data from total U.S. fossil fuel production. Cumulative totals (i.e., sums for the entire projection period) of federal emissions from direct and indirect GHG sources (as CO_2e) for the selected scenario and region are presented in the interactive version of the chart.

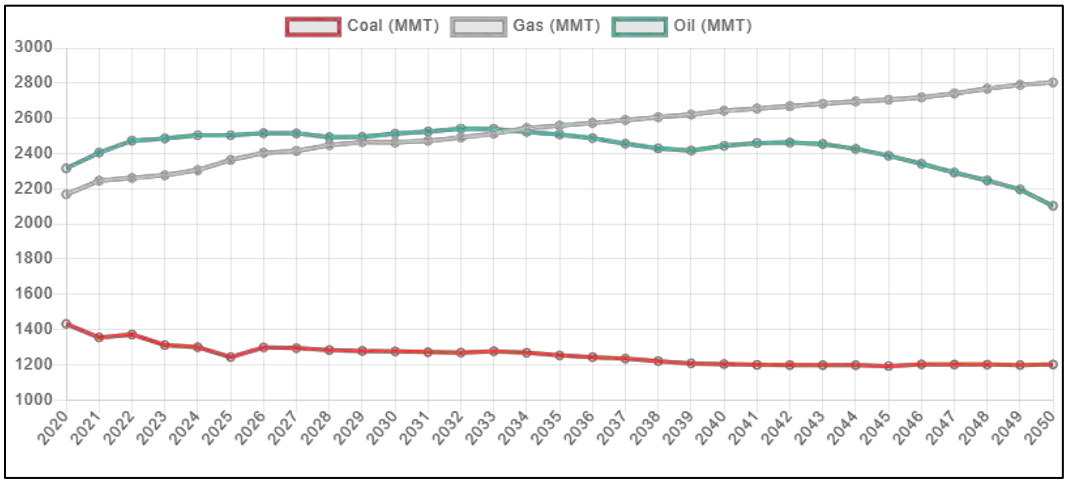


Figure 8 - U.S. Total (federal and non-federal) AEO Projected Emissions (REF2020)

Reference Scenario Emissions (MMT): U.S. Total = 193,014.36 Federal = 27,280.65

Projected Reference Scenario Emissions (MMT CO_2e) for Colorado, New Mexico, Utah, and Wyoming

	Colorado	New Mexico	Utah	Wyoming
Coal	594.75	242.09	607.78	13,515.11
Gas	1,361.58	1,831.00	418.5	2,958.82
Oil	110.92	2,115.42	179.93	832.85
Total	2,067.25	4,188.51	1,206.21	17,306.78

Abbreviations

AGGI Annual Greenhouse Gas Index

AR5 Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change

Bbl barrels

BLM Bureau of Land Management

Btu British thermal units

CF cubic feet

CFR Code of Federal Regulations

CH4 methane

CO2 carbon dioxide

EPA U.S. Environmental Protection Agency

GHG greenhouse gas

Gt gigatons

GtCO2e gigatons of equivalent carbon dioxide

GWPs global warming potential

Kg kilogram

Mcf million cubic feet

N2O nitrous oxide

ppb parts per billion

ppm parts per million

Ppmv parts per million volume

RCP representative concentration pathways

Scf standard cubic foot

W/m2 watt per square meter

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APPENDIX E

Specialist Report on Mercury and Selenium Deposition and Federally Listed Fish

Effects of Mercury and Selenium Deposition on Endangered Colorado River Basin Fish Species

LILA CANYON MINE LEASE MODIFICATIONS

DECEMBER 2020

PREPARED FOR

Bureau of Land Management

PREPARED BY

SWCA Environmental Consultants

EFFECTS OF MERCURY AND SELENIUM DEPOSITION ON ENDANGERED COLORADO RIVER BASIN FISH SPECIES

Prepared for

Bureau of Land Management
Price Field Office
125 South 600 West
Price, Utah 84501
(435) 636-3600
Attn: Dana Truman, Assistant Field Manager - Resources

Prepared by

SWCA Environmental Consultants
257 East 200 South, Suite 200
Salt Lake City, Utah 84111
(801) 322-4307
www.swca.com

December 2020

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CHAPTER 1. INTRODUCTION

Four species of endangered fish in the Upper Colorado River Basin may be indirectly impacted from the combustion of coal at local power generation stations. Combustion of coal releases mercury and selenium into the atmosphere, which may be directly deposited into habitat for the Colorado River fish, or onto adjacent land and subsequently washed into the river. Mercury and selenium are ubiquitous contaminants affecting freshwater environments on a global scale (Day et al. 2020). This report addresses the effects to the four endangered fish and their critical habitat from contaminants released from coal combustion. This report is provided to support the Bureau of Land Management (BLM) Lila Canyon Mine Lease Modifications Environmental Assessment (EA) and the informal consultation process between the BLM and the U.S. Fish and Wildlife Service (USFWS) to determine the potential for effects as a result of the project to Colorado River fish protected under the Endangered Species Act.

1.1 Project Description

The BLM Price Field Office proposes to offer two Lila Canyon coal lease modification areas (LMAs) for lease to the Lila Canyon Mine lessee. The Lila Canyon Mine (Mine) is an underground coal mine approximately 9 miles southeast of East Carbon in Emery County, Utah. The LMAs are located in the Book Cliffs coal field. The two LMAs, if approved, would add collectively 1,272.64 acres to the Mine lessee's Federal coal leases and would be mined by underground methods (the project). The BLM estimates that there are approximately 7.2 million tons of salable coal in these two areas, which are projected to extend the life of the Mine by approximately 2 to 3 years. With this extension, however, the annual coal production limit will not increase unless the Mine lessee applies for and receives a production limit increase from the Utah Division of Air Quality.

The BLM prepared the Lila Canyon Mine Lease Modifications EA (DOI-BLM-UT-G020-2018-0039-EA) to analyze the environmental effects of leasing the LMAs, including their development under a conceptual mine plan. The Mine and Lila Canyon portals are located in T. 16 S., R. 14 E., secs. 10 thru 15 and secs. 22 thru 26, and T. 16 S., R. 15 E., secs. 19 and 30 (see EA Figure 2). The existing Mine development was approved by the Utah Division of Oil, Gas and Mining (DOGM) in 2007 as an extension to the Horse Canyon Mine. The current DOGM permit area (DOGM Permit No. C/007/0013) encompasses 4,663.6 acres. Since 2007, all coal reserves have been accessed through the Lila Canyon portals, and the Lila Canyon Mine lessee would continue to use these portals to access reserves in the LMAs.

CHAPTER 2. SETTING

The LMAs are in rugged, mountainous terrain along the western flanks of the Book Cliffs escarpment, which rises abruptly above the valley floor. The Mine and the LMAs are in the Price River drainage. To the east of the LMAs is the Turtle Canyon Wilderness Area and the steep mountainous areas that are part of the Range Creek drainage. To the west is rolling lowland topography on the highly erodible Mancos Shale that occupies the Price River valley. Elevations in the LMAs range from approximately 8,113 to 6,800 feet above mean sea level. Characteristic vegetation in this area of the Book Cliffs includes Douglas fir (*Pseudotsuga menziesii*) at the

highest elevations, pinyon-juniper forests over most of the bench areas, and a mixture of shrubs and grasses in the low areas (BLM 2000).

The closest coal-loading terminal (unit-train) is the Savage Brothers–owned Savage Coal Terminal between Wellington and Price, Utah, on the mainline of the Union Pacific Railroad, at a haul distance of approximately 32 miles. It is another 12 miles to the Wildcat Unit-Train Loadout, located on the Utah Railway near Helper, Utah. Most of the coal produced at the Lila Canyon Mine is currently shipped to the Hunter Power Plant in Castle Dale and Huntington Power Plant in Huntington, both in northwestern Emery County, Utah.

2.1 Coal-Fired Power Plants

The Hunter and Huntington Power Plants are permitted by the Utah Division of Air Quality under Title V permits; both plants were originally constructed in the 1970s. The Hunter Power Plant, approximately 37 miles (60 kilometers [km]) west-southwest of the LMAs, is a Phase II Acid Rain source and is a major source for SO_2, NOx, PM_{10}, CO, VOC, HAP, HCl, and GHG (UDAQ 2020a). The Huntington Power Plant, approximately 36.5 miles (59 km) west of the LMAs is a Phase II Acid Rain source and is a major source of SO2, NOx, PM10, CO, HAP, HF, and HCl emissions (UDAQ 2020b).

On December 16, 2011, the Environmental Protection Agency (EPA) finalized the first national standards to reduce mercury and other toxic air pollutants from coal- and oil-fired power plants. The Mercury and Air Toxics Standards (MATS) provide regulatory certainty for power plants and levels the playing field so that both new and older plants have to limit their emissions of mercury. The final rule establishes power plant emission standards for mercury, acid gases, and nonmercury metallic toxic pollutants, which is expected to result in preventing about 90% of the mercury in coal burned in power plants from being emitted to the air.

Indirect Emissions of Mercury

Although worst-case (4.5 million tons per year) combustion emissions are presented in the Lila Canyon Mine Lease Modifications EA Table 3-10, the actual mercury emissions can vary based on the quality and characteristics of the coal as well as the control strategies and equipment utilized at the final combustion location. The Mine currently provides regional Utah power plants (e.g., Hunter Power Plant and Huntington Power Plant) with approximately 2% to 7% (U.S. Energy Information Administration 2018) of the total tonnage of coal combusted at the plants annually. If approximately 6.4 million tons of coal are combusted annually at Hunter and Huntington Power Plants, 2 to 7% would represent approximately 128,000 to 447,000 tons of coal. This is 10% or less of the maximum amount of 4.5 million tons of coal that is permitted to be mined annually at the Lila Canyon Mine. If all 4.5 million tons of coal mined annually is transported to a regional coal-fired power plant to be combusted, it would represent approximately 70% of the approximately average annual 6.4 million tons of coal combusted at these plants. Assuming all 4.5 million tons of coal is combusted at Hunter and Huntington Power Plants would provide the maximum potential emissions of mercury that could occur in the airshed.

In 2019, the Hunter and Huntington Power Plants provided actual mercury emissions from all on-site sources via the EPA's Toxic Release Inventory (TRI) program (EPA 2020). The TRI tracks the release of certain toxic chemicals that may pose a threat to human health and the environment. U.S. facilities in different industry sectors must report annually how much of each

chemical is released to the environment and/or managed through recycling, energy recovery, and treatment. The total reported mercury emissions to the atmosphere from fugitive and stack sources at Hunter and Huntington Power Plants in 2019 was 5.9 pounds (lbs). Mercury emissions from the combustion of 4.5 million tons of coal annual from the Federal coal lease tract would be approximately 70% of emissions from Hunter and Huntington, or 4.1 lbs. These emissions are 0.2% of the 1,680 lbs (0.84 tons/year) estimated for a generic power plant without emissions controls (see EA Table 3-10). Emissions controls implemented to comply with MATS are the likely reason why emissions are lower at Hunter and Huntington as opposed to the combustion of coal at a generic power plant.

Based on data available from the TRI data explorer, the total emissions in Utah from industrial and electrical generation sectors is 770 lbs of mercury emissions for reporting year 2019. The estimated mercury emissions (4.1 lbs) from Federal coal lease tracts represent approximately 0.5% of the state's total mercury emissions. Additionally, emissions from Hunter and Huntington Power Plants will continue to occur independent of which alternative is selected. Summarily the mercury emissions from the combustion of coal from the Federal lease tract are minimal as they are a small fraction of overall emissions in the state and would not result in an increase to existing or foreseeable emissions as the power plants would continue to operate without the Federal coal.

When mercury released by the combustion of coal is deposited on land and water, it accumulates in the food chain and can be toxic to fish, wildlife, and humans. Mercury released into the atmosphere by the combustion of coal mined from the Federal coal lease tract could be deposited and accumulate in hydrological systems, potentially affecting fish, wildlife, and humans. The BLM is not aware of site-specific mercury studies for the Hunter or Huntington Power Plants. To help inform the decision the BLM incorporates by reference the results from a mercury deposition analysis conducted by the Electric Power Research Institute (EPRI) (EPRI 2017) for the Craig Generating Station in northwestern Colorado.

The objective of the EPRI study was to determine the relative contributions of mercury emissions from local power plants and from global, regional, and other local sources to mercury deposition in the Yampa and White River Basin. The Yampa and White rivers feed into the Green River, which joins the Colorado River downstream. Mercury is a global pollutant and may undergo atmospheric transport over both short and very long (intercontinental) distances depending on its chemical form. Results of the EPRI study show that natural and non-U.S. sources of mercury were the largest contributors to mercury deposition in the modeling domain. Emissions from the Craig Generating Station accounted for 0.2% of deposition and other local power plants contributed 0.8%. For comparison, in a similar study the EPRI prepared for the Four Corners region (the San Juan River Basin project), the local scale power plants contributed 2% or less of the atmospheric mercury deposition (EPRI 2015, 2016). Mercury emissions from the Craig Generating Station used in the EPRI study were 44.2 lbs/year. Emissions from Hunter and Huntington Power Plants (5.9 lbs/year) is 13% of the emissions from the Craig Generating Station. Emissions from the Federal coal lease (4.1 lbs/year) would be 9.3% of the emissions evaluated in the EPRI study. From this information it is estimated that mercury emissions from Hunter and Huntington Power Plants likely contribute less than 1% to total mercury deposition in in the local airshed and river basins, and as a result the Federal coal lease will have a minimal contribution to overall mercury deposition in the area.

Ultimately, mercury emissions associated with coal combustion sources are evaluated as part of the permitting process or rule implementation (Best Available Retrofit Technology [BART], MATS, etc.) from their respective regulatory agencies (state or EPA). To be clear, all coal-fired power plants are required to have an operating permit (Title V) for any criteria pollutant for which the facility has a potential to emit greater than 100 tons per year. Both Hunter and Huntington Power Plants have obtained Title V operating permits which include conditions limiting mercury emissions. The permitting rule-making process has ample opportunity for public involvement, and the public may also petition EPA for review and remand of the permit after the state has issued it. No action taken under the Clean Air Act shall be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969 (15 United States Code 793(c)(1). Given that courts have consistently recognized that Clean Air Act actions, which themselves are exempt from NEPA requirements,[6] are in fact the functional equivalent of NEPA, it is appropriate for the BLM to rely on those permitting procedures enacted by the state and overseen by the EPA as a basis for asserting that the indirect combustion impacts of the coal lease modification action have already been adequately disclosed and analyzed. Further, because that process provided for meaningful public involvement it need not be readdressed here. Given the rigorous review the combustion facilities receive to emit regulated pollutants it is exceedingly improbable that combusting the lease modification coal would cause or contribute to the likeliness, frequency, or increasing severity of any detrimental impacts to air quality, including mercury deposition, in areas around or downwind of any potential coal combustion facility.

2.2 Endangered Colorado River Fish

Four species of fish listed as endangered under the Endangered Species Act are commonly referred to as the Colorado River fish and consist of the Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). They are historically found in the Colorado River and its tributaries.

2.2.1 Colorado Pikeminnow

The Colorado pikeminnow is endemic to the Colorado River Basin, where it was once widespread and abundant in warm-water rivers and tributaries. Wild populations of Colorado pikeminnow are now found only in the Upper Basin of the Colorado River (above Lake Powell). Three wild populations of Colorado pikeminnow are found in 1,090 miles (1,754 km) of riverine habitat in the Green River, upper Colorado River, and San Juan River subbasins. It thrives in swift-flowing muddy rivers with quiet, warm backwaters and is primarily piscivorous, but smaller individuals also eat insects and other invertebrates. These fish spawn between late June and early September and when they are 5 to 6 years old and at least 16 inches long. Spawning occurs over riffle areas with gravel or cobble substrate. The eggs are randomly splayed onto the bottom and usually hatch in less than 1 week. The USFWS designated six reaches of the Colorado River System as critical habitat for the Colorado pikeminnow on March 21, 1994 (59 *Federal Register* 13374). Designated critical habitat makes up about 29% of the species' historic range and occurs exclusively in the Upper Colorado River Basin. Portions of the Colorado, Gunnison, Green, Yampa, White, and San Juan Rivers are designated critical habitat.

[6] Section 7(c) of the Energy Supply and Environmental Coordination Act of 1974 (15 United States Code 793(c)(1)) exempts actions under the Clean Air Act from the requirements of NEPA.

The primary threats to Colorado pikeminnow populations are competition with and predation by nonnative fish species, streamflow regulation and habitat modification (including cold-water dam releases, habitat loss, and blockage of migration corridors), and pesticides and pollutants. Predation or competition by nonnative fish species is identified as a primary threat to the continued existence or the re-establishment of self-sustaining populations of Colorado pikeminnow and the other three endangered Colorado River fish. Nonnative fishes compete with native fishes through predation, habitat degradation, competition for resources, hybridization, or disease transmission.

Threats from pesticides and pollutants include accidental spills of petroleum products and hazardous materials; discharge of pollutants from uranium mill tailings; and high selenium concentration in the water and food chain (USFWS 2002a). Mercury may pose a significant threat to Colorado pikeminnow populations of the Upper Colorado River Basin. The magnitude of the threat from mercury and selenium is in need of further investigation.

2.2.2 Razorback Sucker

The razorback sucker is the largest native sucker to the western United States, found in deep, clear to turbid waters of large rivers and some reservoirs over mud, sand, or gravel, and like most suckers, feeds on both plant and animal matter. Razorback suckers can spawn as early as age three or four, when they are 14 or more inches long. Breeding males turn black up the lateral line, with brilliant orange extending across the belly. Depending on water temperature, spawning can take place as early as November or as late as June. In the Upper Colorado River Basin, razorbacks typically spawn between mid-April and mid-June. The species is being reintroduced into the Green, Gunnison, upper Colorado and San Juan Rivers, Lakes Mojave and Havasu, and the lower Colorado and Verde Rivers.

The USFWS designated 15 reaches of the Colorado river system as critical habitat for the razorback sucker. Designated critical habitat makes up about 49% of the species' original range and occurs in both the Upper and Lower Colorado River Basins. In the Upper Basin, critical habitat is designated for portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan Rivers.

Population numbers of the razorback sucker were extremely low in the early part of the 2000s. The wild population consisted of primarily aging adults; no young razorback suckers had been captured in the Upper Colorado River since the mid-1960s (USFWS 2002b).

Because of the low numbers of wild fish, the Recovery Program has been rebuilding razorback sucker populations in the Upper Colorado River Basin with hatchery stocks. Stocking continues in the Green, Colorado, and San Juan River subbasins, and reproduction is occurring and increasing. In 2018, the USFWS recommended the razorback sucker be reclassified from endangered to threatened.

The primary threats to razorback sucker populations are streamflow regulation and habitat modification (including cold-water dam releases, habitat loss, and blockage of migration corridors); competition with and predation by nonnative fish species; and pesticides and pollutants (USFWS 2002b). Nonnative species are a major cause for the lack of recruitment and are the most important biological threat to the razorback sucker. Threats to the razorback sucker from nonnative fish are similar to those facing the Colorado pikeminnow.

Historic selenium contamination of the Upper and Lower Colorado River Basins has likely contributed to the decline of these endangered fish by affecting their overall reproductive success, including loss of eggs and larvae. Selenium concentrations in whole-body fish in the Colorado River Basin have been among the highest in the nation (Hamilton 1999). Although selenium has been more the focus of contaminants research involving razorback sucker, mercury could also pose a threat at elevated concentrations. Because the razorback sucker is not a top predator, as the Colorado pikeminnow is, mercury bioaccumulation poses less of a problem for this species. The magnitude of the threat from mercury and selenium is in need of further investigation.

2.2.3 Humpback Chub

Adult humpback chubs are dark on top and light below and fins may have yellow-orange pigment near the base. Adults usually range from 12 to 16 inches long and weigh 0.75 to 2 lbs. This species historically occurred in the mainstream Colorado River in slower eddies and pools downstream below Hoover Dam; however, present populations are restricted to areas in, and upstream, of the Grand Canyon.

Historic distribution research indicates the species inhabited canyons of the Colorado River and four of its tributaries: the Green, Yampa, White, and Little Colorado Rivers. Presently the species occupies about 68% of its historical habitat. Humpback chub move substantially less than other native Colorado River fishes, showing high fidelity to canyon reaches characterized by deep water, swift currents, and rocky substrate.

In the Upper Colorado River Basin, the two most stable humpback chub populations are found near the Colorado/Utah border: one at Westwater Canyon in Utah; and one in an area called Black Rocks, in Colorado. Smaller numbers in the Upper Basin were found in the Yampa and Green Rivers in Dinosaur National Monument, Desolation and Grey Canyons on the Green River in Utah, and Cataract Canyon on the Colorado River in Utah.

The primary threats to humpback chub are streamflow regulation, habitat modification, predation by nonnative fish species, parasitism, hybridization with other native *Gila* species, and pesticides and pollutants (USFWS 2002c). The threats to the humpback chub from nonnative fish are similar to those facing the Colorado pikeminnow, posing a challenge to recovery. Contaminants, including mercury and selenium, may pose a lesser threat as well, but the magnitude of this threat is in need of further investigation.

The USFWS has completed a species status assessment and a 5-year status review that concluded the current risk of extinction for the humpback chub is low, as populations are stable, persisting without the need for hatchery stocking. In 2018, the USFWS recommended the humpback chub be reclassified from endangered to threatened.

2.2.4 Bonytail

The bonytail is a highly streamlined fish often appearing dark in clear water and pale in more turbid waters. It prefers eddies and pools and is not often found in swift currents. This is the rarest of the four endangered Colorado River fish species and wild populations no longer exist upstream of Lake Powell. Individuals may reach 22 inches in length and live 50 years. Bonytail feed on insects, plankton, and plant matter. The species is being reintroduced into the Green, and

upper Colorado rivers, Lakes Mojave and Havasu, and the lower Colorado River to Yuma, Arizona.

USFWS designated seven reaches of the Colorado River as critical habitat for the bonytail. Portions of the Green, Yampa, and Colorado Rivers are designated as critical habitat, representing about 14% of the species' historic range.

Bonytail are so rare that it is currently not possible to conduct population estimates. In response to the low abundance of individuals, the Recovery Program is implementing a stocking program to re-establish populations in the Upper Basin. Most stocked bonytail do not appear to survive very long after release into a given river. Researchers continue to experiment with prerelease conditioning and exploring alternative release sites to improve their survival. An increasing number of bonytail have been detected at several locations throughout the Upper Colorado River Basin.

The primary threats to bonytail populations are streamflow regulation and habitat modification (including cold-water dam releases, habitat loss, and blockage of migration corridors); competition with and predation by nonnative fish species; hybridization; and pesticides and pollutants (USFWS 2002d). The threats to the bonytail from nonnative fish are similar to those facing the Colorado pikeminnow.

2.2.5 Critical Habitat

Critical habitat for all four endangered fish was designated in 1994 (59 *Federal Register* 13374). The critical habitat for the four Colorado River fish species all contain the primary constituent elements (PCEs) that are required to be present and are determined to be necessary for the survival and recovery of the species. All four species' critical habitat contains the following PCEs (50 Code of Federal Regulations 13378):

1. Water: this includes a quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species.

2. Physical habitat: this includes areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. In addition to river channels, these areas also include bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year floodplain, which, when inundated, provide spawning, nursery, feeding and rearing habitats, or access to these habitats.

3. Biological environment: food supply, predation, and competition are important elements of the biological environment and are considered components of this constituent element. Food supply is a function of nutrient supply, productivity, and availability to each life stage of the species. Predation and competition, although considered normal components of this environment, are out of balance due to introduced nonnative fish species in many areas.

CHAPTER 3. EFFECTS OF MERCURY AND SELENIUM

3.1 Mercury

The Colorado River fish may be indirectly impacted from the combustion of coal at local power generation stations. Combustion of coal releases mercury into the atmosphere which may be deposited into habitat for the Colorado River fish directly, or onto adjacent land and subsequently washed into the river.

Mercury is a concern primarily to longer-lived fish species (e.g., Colorado pikeminnow) because it bioaccumulates within the tissue of individuals. Therefore, the longer an individual lives and absorbs mercury, the higher the levels within their tissues over time. Mercury can affect an individual's central nervous system, alter their behaviors (e.g., reduced predator avoidance), and disrupt the endocrine system resulting in reduced reproductive success (Lusk 2010). Although the specific effects of mercury and other heavy metals on pikeminnow are known, the role these contaminants play on suppressing populations of the Colorado River fish are not well understood (USFWS 2011a).

Mercury contamination is a widespread problem across the United States. The vast majority of health advisories issued by the EPA for the consumption of fish from lakes and reservoirs are due to mercury, PCBs, dioxins and furans, DDT, and chlordane. Of those, mercury is the most commonly detected. Of predacious fish sampled in 2008, 48.8% of the sampled population of lakes across the country had mercury tissue concentrations that exceeded the 0/3 micrograms per gram (parts per million) human health screening value for mercury, which represented a total of 36,422 lakes (EPA 2009).

The harmful effects of methylmercury on fish populations at existing exposure levels in many North American freshwaters would be sublethal, such as cellular damage, reduced vigor, and reduced reproduction. Direct mortality due to methylmercury has been observed only at high concentrations (Sandheinrich and Wiener 2011).

Rather than direct mortality, it is expected that chronic toxicity from exposure to mercury in the action area may be affecting the endangered fish. Chronic toxicity is the development of negative effects as the result of long-term exposure to a toxicant or other stressor. It can manifest as direct lethality but more commonly refers to sublethal endpoints such as decreased growth, reduced reproduction, or behavioral changes such as impacted swimming performance.

It is known that combustion of coal is releasing mercury into the area and estimates of quantity are known at various sources. It is not known specifically, however, what proportion of that mercury deposits within the analysis area, or the Colorado River Basin watershed, or is transported to distant locations beyond the limits of the local watersheds. Although not fully understood or quantified, it is believed that the primary impact from coal combustion to the Colorado River fish is from the emission and subsequent deposition of mercury and eventual integration into fish tissue. Mercury poses a greater threat to the Colorado pikeminnow, as compared to the other endangered fish in the Colorado River Basin. In the Upper Colorado River Basin, elevated levels of mercury were found in tissue samples of only 13% of the 2,324 individual fish that were sampled from seven major tributaries to the Colorado River in a retrospective study of selenium and mercury in fish tissues gathered over 50 years (1962–2011)

(Day et al. 2020). Of the 17 species of fish sampled, Colorado Pikeminnow most frequently had the highest levels of mercury.

Mercury from the combustion of coal that is deposited either on land or water surfaces in the analysis area has the potential to affect the designated critical habitat for these species. This would occur primarily by increasing the amount of contaminates present in those areas (PCE No. 1). It is difficult to quantify the level of this impact to critical habitats given the lack of information on where the mercury in the analysis area originates from. As stated in Section 2.1, the mercury emissions from the Mine LMAs (4.1 lbs/year) as a portion of coal burned at the Hunter and Huntington Power Plants would likely contribute less than 1% to total mercury deposition in in the local airshed and river basins. The leasing of the LMAs would contribute minimally to overall mercury deposition in the area.

When added to the other regional and global sources of mercury being deposited into the Colorado River system and the mercury already within the system, additional mercury may result in impacts to critical habitat through a reduction in water quality but would not be likely to adversely affect habitat to a point that it no longer provides water of sufficient quality essential for the conservation of the Colorado River fish species.

3.1.1 Colorado Pikeminnow

The Colorado pikeminnow is expected to be at the greatest risk from exposure to mercury. Colorado pikeminnow have a higher likelihood of bioaccumulating mercury. Predatory organisms at the top of the food web generally have higher mercury concentrations in their bodies because mercury tends to biomagnify up through the food chain and concentrate in upper trophic levels (EPA 1997). The Colorado pikeminnow is a top predator. The Colorado pikeminnow is also a long-lived fish, living 55 years or more (Osmundson et al. 1997). Thus, mercury will accumulate more rapidly and over a longer period of time than in the other three endangered fish species.

Based on studies of mercury concentrations in Colorado pikeminnow over time, it is expected that some Colorado pikeminnow in the action area may already be experiencing chronic, sublethal harmful effects from elevated mercury concentrations. It should be noted, however, that piscivorous fish living in fresh waters in the midwestern and eastern United States and in some waters in the western United States contaminated by mining activities, have been reported to contain harmful levels of mercury in muscle tissue (Sandheinrich and Wiener 2011). Thus, harmful effects to predatory fish from mercury are not isolated to this action area but are part of a geographically widespread problem.

Given that fish tissue mercury concentrations have been determined to be elevated in Colorado pikeminnow, and coal mining and local combustion add mercury to the system, this additional mercury adds to any negative effects resulting from mercury exposure. Based on best available science, it is believed some Colorado pikeminnow individuals are experiencing low, chronic negative health effects from mercury already in the action area. The mercury added by this project will add to the effects of the chronic condition, although the relative contribution of project-related mercury is assumed to be a very small percentage of the total mercury that has been and will continue to be deposited in the analysis area.

Despite the chronic, low-level harmful effects of mercury that Colorado pikeminnow are likely experiencing, it is believed that the populations decline seen in Colorado pikeminnow over the past decade or more is primarily a result of increased nonnative fish species.

Although some Colorado pikeminnow individuals are likely experiencing low-level harmful effects from existing mercury in the system, it is not believed that the additional amount of mercury from the project would be enough to significantly or measurably reduce population numbers, reproduction, or constrain Colorado pikeminnow distribution.

3.1.2 Razorback Sucker

The effects to the razorback sucker from project-generated mercury are similar to those described for the Colorado pikeminnow above, although likely to be less severe in the analysis area. The razorback sucker is not a piscivorous fish and would not bioaccumulate mercury as rapidly as the Colorado pikeminnow. As with the Colorado pikeminnow, it is believed nonnative species are the primary limiting factor for razorback sucker numbers, successful recruitment, and their distribution. Although the evidence indicates that some razorback sucker individuals are likely being adversely affected by mercury in the system, evidence does not indicate that the negative effects from mercury rise to the level of reducing population numbers, are limiting reproduction, or are constraining razorback sucker distribution.

3.1.3 Humpback Chub

The effects to the humpback chub in the action area from project-generated mercury are similar to those described for the Colorado pikeminnow above, although perhaps less severe. The humpback chub is not a top predator and may not bioaccumulate mercury as rapidly as the Colorado pikeminnow. As with the Colorado pikeminnow, it is believed nonnative species are the primary limiting factor for humpback chub numbers, successful recruitment, and their distribution. Although the evidence indicates that some humpback chub individuals are likely being adversely affected by mercury in the system, evidence does not indicate that the negative effects from mercury rise to the level of reducing population numbers, are limiting reproduction, or are constraining humpback chub distribution.

3.1.4 Bonytail

The effects to the Bonytail in the action area from project-generated mercury are similar to those described for the Colorado pikeminnow above, although perhaps less severe. The bonytail is not a top predator and may not bioaccumulate mercury as rapidly as the Colorado pikeminnow. As with the Colorado pikeminnow, it is believed nonnative species are the primary limiting factor for bonytail numbers, successful recruitment, and their distribution. Although the evidence indicates that some bonytail individuals are likely being adversely affected by existing mercury in the system, evidence does not indicate that the negative effects from mercury rise to the level of reducing population numbers, are limiting reproduction, or are constraining bonytail distribution.

3.2 Selenium

In addition to mercury, indirect impacts to the Colorado River fish from increases in selenium could occur from the combustion of coal at the Hunter and Huntington Power Plants. However, the EPA's TRI shows no reported selenium emissions at Hunter and Huntington Power Plants (EPA 2020). Selenium, a trace element, is a natural component of coal and soils in the area and can be released to the environment by the irrigation of selenium-rich soils and the burning of coal in power plants with subsequent emissions to air and deposition to land and surface water. Contributions from anthropogenic sources have increased with the increases of world population, energy demand, and expansion of irrigated agriculture. Selenium, abundant in western soils, enters surface waters through erosion, leaching, and runoff. Although required in the diet of fish at very low concentrations (0.1ug/g) (Sharma and Singh 1984), it is unknown if selenium is adversely affecting Colorado River fish. Dietary selenium is the primary source for selenium in fish (Lemly 1993); selenium in water is less important than dietary exposure when determining the potential for chronic effects to a species (EPA 1998).

Excess selenium in fish has been shown to have a wide range of adverse effects, including mortality, reproductive impairment, effects on growth, and developmental and teratogenic effects, including edema and finfold, craniofacial, and skeletal deformities (Lemly 2002). Excess dietary selenium causes elevated selenium concentrations to be deposited into developing eggs, particularly the yolk (Buhl and Hamilton 2000). If concentrations in the egg are sufficiently high, developing proteins and enzymes become dysfunctional or result in oxidative stress, conditions that may lead to embryo mortality, deformed embryos, or embryos that may be at higher risk for mortality.

Of the four Colorado river fish species, selenium would disproportionately affect the razorback sucker more than the other three species. As with all sucker species, the razorback sucker is a bottom feeder and more likely to ingest selenium that has precipitated to the river bottoms. In the Upper Colorado River Basin, elevated levels of selenium have been found in tissue samples of 48% of the fish that were sampled (Day et al. 2020).

Impacts to critical habitat from selenium added to the system through coal combustion, together with selenium in the system from other sources, may affect critical habitat for the endangered fish; however, the project would not diminish water quality to a point where critical habitat can no longer provide the physical and biological features essential for the conservation of the endangered Colorado River fish species.

3.2.1 Colorado Pikeminnow

Given that water concentrations are generally below the chronic standard, there are no recent data indicating that there is immediate cause for alarm. It is believed nonnative species are the primary limiting factor for Colorado pikeminnow numbers, successful recruitment, and their distribution. Although further sampling and testing for selenium is warranted, evidence does not indicate that potential effects from selenium rise to the level of reducing population numbers, are limiting reproduction, or are constraining Colorado pikeminnow.

3.2.2 Razorback Sucker

Given that water concentrations are generally below the chronic standard, there are no recent data indicating that there is immediate cause for alarm. It is believed nonnative species are the primary limiting factor for razorback sucker numbers, successful recruitment, and their distribution. Although further sampling and testing for selenium is warranted, evidence does not indicate that potential effects from selenium rise to the level of reducing population numbers, are limiting reproduction, or are constraining razorback sucker.

3.2.3 Humpback Chub

Given that water concentrations are generally below the chronic standard, there are no recent data indicating that there is immediate cause for alarm. It is believed nonnative species are the primary limiting factor for humpback chub numbers, successful recruitment, and their distribution. Although further sampling and testing for selenium is warranted, evidence does not indicate that potential effects from selenium rise to the level of reducing population numbers, are limiting reproduction, or are constraining humpback chub.

3.2.4 Bonytail

Given that water concentrations are generally below the chronic standard, there are no recent data indicating that there is immediate cause for alarm. It is believed nonnative species are the primary limiting factor for bonytail numbers, successful recruitment, and their distribution. Although further sampling and testing for selenium is warranted, evidence does not indicate that potential effects from selenium rise to the level of reducing population numbers, are limiting reproduction, or are constraining bonytail.

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APPENDIX F

Public Comments on the Draft EA

Lila Canyon Mine Lease Modifications Environmental Assessment – Price Field Office – Responses to Public Comments

The Bureau of Land Management (BLM) Price Field Office shared its Lila Canyon Mine Lease Modifications Draft environmental assessment (EA) with the public on April 24, 2020 and offered a 30-day public comment period that was extended until June 8, 2020. The following table comprises the BLM Price Field Office's responses to all substantive comments received. Substantive comments do one or more of the following: 1) Question, with reasonable basis, the accuracy of information in the EA; 2) Question, with reasonable basis, the adequacy of the methodology or assumptions used for the EA; 3) Present new information relevant to the analysis; 4) Present reasonable alternatives other than those analyzed in the EA; and 5) Cause changes or revisions in one or more of the alternatives.

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Comment #	Commenter	Comment Topic	Comment	BLM Response
1	Emery County	Socio-Economic Impacts	The Estimated Employment Requirements in the EA states that: "Leasing the Lila Canyon proposed modification tracts would extend the life of the Mine, but neither the workforce of approximately 238 nor the annual production, which "shall not exceed 4.5 million tons per rolling 12-month period" (Utah Division of Air Quality [DAQ] 2013), would be expected to increase." Maintaining the current workforce is important to the area, as is the extended life of the mine. The EA should also recognize the economic benefit to the numerous support industries in the Carbon/Emery area, including the trucking industry. In addition, the taxes, revenues and royalties generated as a result of the lease modifications are several million dollars. Clearly, the continued operation and productivity of the Lila Canyon Mine is crucial for the economic viability of Emery and Carbon Counties. It is also crucial for the security of the local, regional and national energy network. These crucial issues cannot be overstated.	Comment acknowledged. The analysis in Section 3.3.3 of the EA describes the socioeconomic effect of secondary employment as well as taxes, revenues, and royalties. The BLM Price Field Office (PFO) Resource Management Plan (RMP) includes goals to provide opportunities for mineral extraction and development to support the need for domestic energy resources (EA Section 1.5).
2	Emery County	Dingell Act and WSA	No reference should be made to Turtle Canyon Wilderness Study Area. The John D. Dingell, Jr. Conservation, Management, and Recreation Act released lands not designated as wilderness from the wilderness study area. The release included the portion of the Turtle Canyon WSA which overlapped the proposed lease modifications. The proposed lease modifications are consistent with federal law and federal land management plans.	The Turtle Canyon Wilderness Study Area (WSA) was described to provide context for compliance with the PFO RMP, which was finalized in 2008 and includes the Turtle Canyon WSA. Management Decision WSA-7 provides for management of lands released from wilderness study (EA Section 1.5).
3	Joint NGO Letter (Environmental Defense Fund, Institute for Policy Integrity at New York University School of Law, Montana Environmental Information Center, Natural Resources Defense Council, Sierra Club, Southern Utah Wilderness Alliance, Union of Concerned Scientists, WildEarth Guardians)	NEPA	NEPA directs agencies to fully and accurately analyze and disclose the potentially significant environmental, public health, and social welfare impacts of the proposed alternatives, and to contextualize that information for decision-makers and the public, in an environmental impact statement. NEPA requires a more searching analysis than merely disclosing the amount of pollution. Rather, BLM must examine the "ecological[,]… economic, [and] social" impacts of those emissions, including an assessment of their "significance."8 By failing to use available tools, such as the social cost of carbon, to analyze and disclose the potentially significant impacts of the greenhouse gas emissions resulting from the proposed action, BLM has violated NEPA.	Comment acknowledged. The preparation of this leasing EA was done in compliance with all federal statutes, regulations, and applicable policies. The BLM considered whether performing a SCC analysis would help inform the decision-maker and the public for this NEPA review, by disclosing meaningful information regarding the Proposed Action's potential impacts on GHG emissions and climate change. After careful consideration, the BLM determined this approach was not appropriate and instead favored a quantitative analysis of these potential impacts. See EA, Section 3.2.3.3. Specifically, the BLM rejected the SCC approach because 1) that approach, adopted in EO 12866 (58 Fed. Reg. 51,735 [October 4, 1993]), was originally intended to apply only to rulemaking, not project-specific NEPA analyses, like the one here; 2) this guidance has subsequently been withdrawn by EO13563 (76 Fed. Reg. 3821 [Jan. 18, 2011]); 3) NEPA does not require a cost-benefit analysis (40 CFR 1502.23); and 4) because the full social impacts of coal development have not been monetized, quantifying only the SCC without considering all other cost/benefits, and would skew the analysis and not be useful. The EA includes a robust analysis of direct and downstream GHG emissions and analyzed those emissions in the context of local, statewide, regional, national, and global projections, which provides the contextual understanding of relative impacts. The BLM approach in the EA meets the "hard look" requirement by presenting the environmental impacts of the proposal and the alternatives in comparative form (quantified greenhouse gas emissions), and discusses cumulative climate impacts, providing for the definition of issues and environmental consequences and ensuring that an informed decision can be made. In addition, the *Utah Bureau of Land Management Air Resource Management Strategy 2020 Monitoring Report* (BLM 2020b) describes GHG emissions from oil and gas wells and has been incorporated into the cumulative discussion. Appendix D has been added to the EA, which summarizes national and regional trends in energy production and emissions. Finally, an analysis of the cumulative effects was performed and considered potential climate change impacts at the state level based on future climate trends under a range of global GHG emissions scenarios known as the representative concentration pathways (RCP). Specifically, the USGS Climate Change Viewer was used to provide projections of future climate trends under low (RCP4.5) and aggressive (RCP8.5) emission scenarios. See EA, Section 3.2.3.6.

Comment #	Commenter	Comment Topic	Comment	BLM Response
4	Joint NGO Letter	Climate Change	Even in combination with a general, qualitative discussion of climate change, by calculating only the tons of greenhouse gases emitted, an agency fails to meaningfully assess and disclose the potentially significant incremental impacts to property, human health, productivity, and so forth. An agency therefore falls short of its legal obligations and statutory objectives by disclosing only volume estimates. To take an analogous example, courts have held that just quantifying the acres of timber to be harvested or the miles of road to be constructed does not constitute a "description of actual environmental effects," even when paired with a qualitative "list of environmental concerns such as air quality, water quality, and endangered species," when the agency fails to assess "the degree that each factor will be impacted." By monetizing climate damages using the social cost of greenhouse gas metrics, BLM can help satisfy NEPA's legal obligations and statutory goals to assess and disclose potentially significant incremental effects bearing on the public interest. The social cost of greenhouse gases methodology calculates how the emission of an additional unit of greenhouse gases affects atmospheric greenhouse concentrations, how that change in atmospheric concentrations changes temperature, and how that change in temperature incrementally contributes to the above list of economic damages, including property damages, energy demand effects, lost agricultural productivity, human mortality and morbidity, lost ecosystem services and non-market amenities, and so forth[citation provided in original comment]. The social cost of greenhouse gases tool therefore captures the factors that actually affect public welfare and assesses the degree of impact to each factor, in ways that just estimating the volume of emissions cannot.	As stated in the EA, Section 3.2.3.5, "The SCC protocol does not measure the actual incremental impacts of a project on the environment and does not include all the positive or negative effects of carbon emissions. The SCC protocol estimates economic damages associated with an increase in CO_2 emissions and includes, but is not limited to, potential changes in net agricultural productivity, human health, and property damages from increased flood risk over hundreds of years." The BLM has acknowledged that climate science does not allow a precise connection between project-specific GHG emissions and specific environmental effects of climate change. This approach is consistent with the approach that federal courts have upheld when considering NEPA challenges to BLM federal coal leasing decisions. WildEarth Guardians v. Jewell, 738 F.3d 298, 309 n.5 (D.C. Cir. 2013); WildEarth Guardians v. BLM, , 8 F. Supp. 3d 17; 34 (D.D.C. 2014). The analysis provided by this leasing EA is consistent with existing BLM direction. Also, see responses to Comments #3 and #5.
5	Joint NGO Letter	Climate Change	Capturing how marginal climate damages change as the background concentration changes is especially important because NEPA requires assessing both potentially significant present and future impacts [citation provided in original comment]. Different project alternatives can have different greenhouse gas consequences over time. Most simply, different alternatives could have different start dates or other consequential changes in timing. Calculating volumes or percentages, especially on an average annual basis as BLM does here, is insufficient to accurately compare the climate damages of project alternatives with varying greenhouse gas emissions over time. By reporting only volumetric greenhouse gas projections, BLM paints an incomplete and misleading portrait of the relative climate impacts of the proposed action. This problem would be easily solved by applying the social cost of greenhouse gases metric, which seamlessly accounts for timing differences between different alternatives. By factoring in projections of the increasing global stock of greenhouse gases as well as increasing stresses to physical and economic systems, the social cost of greenhouse gas metrics enable accurate and transparent comparisons of projects with varying greenhouse gas emissions over time.	SCC estimates the monetary cost incurred by the emission of one additional metric ton of carbon dioxide (CO_2), and is not applicable to non-CO_2 GHG emissions, such as methane. Estimating SCC is challenging because it is intended to model effects on the welfare of future generations at a global scale caused by additional carbon emissions occurring in the present and does not account for the complexity of multiple stressors and indicators. The SCC was developed to support agencies in responding to EO 13514, not for use in making land management decisions. Also, see response to Comment #3.
6	Joint NGO Letter	Climate Change	NEPA requires sufficient informational context. Yet the limited context that BLM provides for the project's projected greenhouse gas emissions—namely, comparing such totals to largely irrelevant volumes of greenhouse gas emissions including the U.S. greenhouse gas inventory [citation provided in original comment]—provides a confusing and inadequate picture that attempts to minimize the impacts of the proposed action's substantial emissions. Indeed, in a country of over 300 million people and over 6.5 billion tons of annual greenhouse gas emissions, it is far too easy to make highly significant effects appear relatively trivial[citation provided in original comment]. Indeed, as the District of Montana recently explained, "[t]he global nature of climate change and greenhouse-gas emissions means that any single lease sale or BLM project likely will make up a negligible percent of state and nation-wide greenhouse gas emissions."—yet, as the court explained, that fact does not excuse agencies from their obligation to meaningfully assess their action's contributions to climate change[citation provided in original comment]. In other words, percentages can be misleading and can be manipulated by the choice of the denominator; what matters is the numerator's actual contribution to total harm… By presenting large quantities of emissions—more than 12 million metric tons—as a tiny percentage representing less than 0.2 percent of a much larger total, the EA is likely to cause stakeholders to misunderstand the true significance of these emissions and treat them as meaningless. By comparison, through monetization it becomes clear that, for example, annual gross emissions from the project could cause about $633 million in climate damages *in a single year* [citation provided in original comment].	BLM recognizes that GHG emissions contribute to increased concentrations of GHG in the atmosphere and, thus, contribute to global climate change. Information about climate change projections from global climate models that evaluate natural systems and feedback mechanisms contributing to climate variability globally is available in the IPCC's Fifth Assessment Report (AR5) (IPCC 2014), and the EA includes a basic synthesis of these results, briefly, stating: "The range of likely change in global surface temperature by 2050 ranges from 0.3 to 1 degree Celsius for the RCP2.6 scenario and from 0.5 to 2.0 degrees Celsius for the RCP8.5 scenario ... When discussing regional impacts, however, it is important to note that degrees of surface temperature increases vary from region to region." Because there are over 30 climate change models, and projected effects of global climate change vary from region to region, the general approach of the BLM and OSMRE has been to quantify the incremental increase in GHG emissions resulting from a project to determine the relative intensity of the project's potential impacts, then to discuss the potential effects of climate change in the region where the project occurs in lieu of attempting to summarize all potential scenarios and varying regional impacts of climate change globally. Also, see response to Comment #4.

Comment #	Commenter	Comment Topic	Comment	BLM Response
7	Joint NGO Letter	Climate Change	Additionally, abstract volume estimates fail to give people the required informational context due to another well-documented mental heuristic called “scope neglect.” Scope neglect, also explained by Kahneman and others, causes people to ignore the size of a problem when estimating the value of addressing the problem… By failing to contextualize greenhouse gas emissions in the EA, BLM potentially misleads the reader into believing that there would be no climate effects from the proposed action, or that the effects would be extremely limited. As a result of scope neglect, for instance, many decisionmakers and members of the public may be unable to meaningfully contextualize the significance of 0.2% of U.S. emissions. While decisionmakers and the public may be able to tell this is a non-zero number, without any context it may be difficult to weigh the climate risks to which this volumetric estimate equates. In contrast, the project’s climate risks would be readily discernible through application of the social cost of greenhouse gas metrics. While the impact of releasing an additional 12.17 million metric tons of carbon dioxide equivalent annually into the atmosphere may seem indiscernible, that impact is clearly conveyed by explaining that such a figure represents approximately $633 million per year in annual climate damages[citation provided in original comment].	Climate change and potential climate impacts, in and of themselves, are often not well understood by the general public (Etkin and Ho 2007; National Research Council 2009). This is in part due to the challenges associated with communicating about climate change and climate impacts, stemming in part from the fact that most causes are invisible factors (such as greenhouse gases) and there is a long lag time and geographic scale between causes and effects (National Research Council 2010). Research indicates that for difficult environmental issues such as climate change, most people more readily understand if the issue is brought to a scale that is relatable to their everyday life (Dietz 2013); when the science and technical aspects are presented in an engaging way, such as narratives about the potential implications of the climate impacts (Corner et al. 2015) and by using examples and making information relevant to the audience while also linking the local and global scales (National Research Council 2010). The approach taken by the BLM for this EA to discuss climate change provides impacts at several scales whereas the social cost of carbon metric only provides an impact metric at the global scale. This limits the usefulness for the decision-maker given the lack of information on more localized impacts. Also, see response to Comment #3.
8	Joint NGO Letter	Climate Change	Monetizing climate damages provides the informational context required by NEPA, whereas a simple tally of emissions volume and a qualitative, generic description of climate change are misleading and fail to give the public and decisionmakers the required information about the magnitude of discrete climate effects [citation provided in original comment]. Thus, while BLM treats “emissions as a proxy for the potential climate change impact from the Proposed Action” throughout the EA [citation provided in original comment], the social cost of greenhouse gases metrics in fact convey and contextualize the project’s potentially significant climate effects in ways that quantification alone cannot, and thus should be utilized to help satisfy the agency’s obligations under NEPA.	The BLM prepared this EA to fully satisfy its obligations under NEPA. Please see the response to Comment #3 for reasons the BLM did not monetize climate effects in this EA.
9	Joint NGO Letter	Climate Change	Though NEPA does not always require a full and formal cost-benefit analysis [citation provided in original comment], agencies’ approaches to assessing costs and benefits must be balanced and reasonable. Courts have warned agencies, for example, that an agency cannot selectively monetize benefits in support of its decision while refusing to monetize the costs of its action [citation provided in original comment]. … The EA monetizes economic benefits similar to those highlighted in High Country and MEIC, including government revenues such as taxes and royalties [citation provided in original comment]. BLM does not sufficiently justify this inconsistent approach to monetizing some potentially significant effects but not others, but tries to skirt the precedent set in the cases discussed above by labeling taxes and royalties as “economic impacts” rather than costs or benefits [citation provided in original comment]. First, as explained in MEIC v. OSM, this is a semantical “distinction without a difference.” [citation provided in original comment] Indeed, NEPA regulations group all impacts—including economic, social, ecological, and public health—under the same category of “effects,” and NEPA requires the agency to discuss all of these effects in as much detail as possible [citation provided in original comment]. Whether a potentially significant effect is a cost, benefit, or transfer, if monetization is the best way to assess it and contextualize its precise impacts, then monetization is also the best way to comply with NEPA’s obligations. Second, BLM uses the sale price for coal, which reflects market value of the resource, to calculate possible royalties from the proposed action [citation provided in original comment]. This explicitly uses the market price into the calculation of the action’s economic “effects.” [citation provided in original comment] In a competitive market, like for coal, oil, and gas, the market price is typically thought to reflect aggregate willingness to pay based on social utility. Therefore, in calculating and reporting royalties, BLM has effectively presented a monetized estimate of the proposed action’s projected social benefits. Furthermore, the annual economic output from mine is about $146.25 million [citation provided in original comment], which is far outweighed by the project’s climate costs of $633 million… Agencies are every bit as capable of monetizing climate damages as they are of monetizing socioeconomic impacts. BLM therefore violates NEPA by monetizing potentially significant social and economic effects in the EA while refusing to monetize climate impacts.	Taxes and revenues from coal production are described in the socioeconomics affected environment portion of the EA, which describes existing conditions. Because the proposed leasing action is a continuation of current conditions, it is reasonable to describe the continuation of taxes and revenues. The EA based this assessment on the stated assumption that the average price for coal would be similar to the 2017 average sales price. The EA also recognizes the potential for “boom and bust” cycles in natural resource economies. Also, see response to Comment #3.

Comment #	Commenter	Comment Topic	Comment	BLM Response
10	Joint NGO Letter	Monetizing emissions	BLM argues that it cannot monetize the proposed action's effects on greenhouse gas emissions because "the [social cost of greenhouse gases] protocol does not measure the actual incremental impacts of a project on the environment."[citation provided in original comment] BLM further argues that "the [social cost of greenhouse gases] dollar cost figure is generated in a range and provides little benefit in assisting the authorized officer's decision for project level analyses."[citation provided in original comment] This statements, however, is simply incorrect: the social cost of greenhouse gas protocol is exactly such a tool to monetize the incremental climate impacts of specific projects or plans, and to contextualize the magnitude of those impacts. NEPA requires BLM to use the best available science to support its NEPA analysis, and the social cost metrics remain the best estimates yet produced by the federal government for monetizing the impacts of greenhouse gas emissions and are "generally accepted in the scientific community."[citation provided in original comment]	Please see the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA.
11	Joint NGO Letter	Social Cost Metrics	BLM argues that use of the IWG's social cost metrics is inappropriate for this EA because it "is not engaged in a rulemaking for which the [social cost of carbon] protocol was originally developed."[citation provided in original comment] But this argument misses the point: BLM fails to explain why those metrics should not be used in environmental reviews when they provide the best method to convey the potentially significant climate impacts of a project that would contribute substantially to greenhouse gas emissions. Indeed, there is nothing in the development of the social cost metrics that would limit applications to other contexts. The social cost of greenhouse gases measures the marginal cost of any additional unit of greenhouse gases emitted into the atmosphere. The government action that precipitated that unit of emissions—a regulation, the granting of a permit, a project approval, or a master development plan—is irrelevant to the marginal climate damages caused by its emissions. Whether emitted by a leaking pipeline or the extraction process, because of a regulation or an integrated planning decision, or in Alaska or Maine, the marginal climate damages per unit of emissions remain the same. Indeed, the social cost of greenhouse gases has been used by many federal and state agencies in environmental impact reviews [citation provided in original comment] and resource management decisions [citation provided in original comment].	Please see the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA.
12	Joint NGO Letter	Social Cost of GHG	Some of the potentially significant incremental impacts on the environment that the social cost of greenhouse gas protocol captures—and which the EA fails to meaningfully analyze—include property lost or damaged; impacts to agriculture, forestry, and fisheries; impacts to human health; changes in fresh water availability; ecosystem service impacts; impacts to outdoor recreation and other non-market amenities; and some catastrophic impacts, including potentially rapid sea-level rise, damages at very high temperatures, or unknown events [citation provided in original comment]. A key advantage of using the social cost of greenhouse gas tool is that each physical impact—such as sea-level rise and increasing temperatures—need not be assessed in isolation. Instead, the social cost of greenhouse gases tool conveniently groups together a multitude of climate impacts and, consistent with NEPA regulations, [citation provided in original comment] enables agencies to assess whether all those impacts are cumulatively potentially significant and to then compare those impacts with other impacts or alternatives using a common metric.	Please see the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA.
13	Joint NGO Letter	Significance of GHG emissions	While there may not be a bright-line test, the emissions BLM estimates for this project are potentially significant and warrant monetization. This is especially true since, once emissions have been quantified, the additional step of monetization through application of the IWG's cost estimates entails a simple arithmetic calculation [citation provided in original comment]. It is difficult to understand how NEPA's mandate that an agency take a "hard look" at the potentially significant environmental impacts of its actions in an environmental impact statement can be satisfied if BLM fails to take the simple step of analyzing the potentially significant impacts of the greenhouse gas emissions that it quantifies.	Please see Section 3.2.3.5 of the EA and the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA.

Comment #	Commenter	Comment Topic	Comment	BLM Response
14	Joint NGO Letter	Social Cost of GHG	BLM further implies that use the social cost of greenhouse gases would be inappropriate because it has not monetized the project's benefits [citation provided in original comment]. This is mistaken for several reasons. First, as noted above, BLM has monetized the full benefits of the project as an input into its calculation of government royalties [citation provided in original comment]. BLM's repeated attempts to hide behind its failure to monetize the proposed action's benefits therefore fails… Monetizing the project's potentially significant climate effects could also provide a framework for making decisions when some effects but not others are monetized, through what is known as "break-even analysis."… Even if BLM is unable to fully monetize all costs and benefits, it should explain why the alleged benefits of this proposal, about $146 million per year [citation provided in original comment], are worth the roughly $633 million in annual climate costs. Moreover, even without using something as formal as a break-even analysis, it is clear that monetizing climate damages provides useful information whether or not every effect can be monetized in a full cost-benefit analysis. NEPA regulations acknowledge that when monetization of costs and benefits is "relevant to the choice among environmentally different alternatives," "that analysis" can be presented alongside "any analyses of unquantified environmental impacts, values, and amenities." [citation provided in original comment]	Please see the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA.
15	Joint NGO Letter	Social Cost of GHG	In March 2017, President Trump disbanded the IWG and withdrew its technical support documents. [citation provided in original comment] Nevertheless, Executive Order 13,783 assumes that federal agencies will continue to "monetiz[e] the value of changes in greenhouse gas emissions" and instructs agencies to ensure such estimates are "consistent with the guidance contained in OMB Circular A-4." [citation provided in original comment] Consequently, while federal agencies no longer benefit from ongoing technical support from the IWG on using the social cost of greenhouse gases, by no means does the new Executive Order imply that agencies should not monetize potentially significant effects in their environmental impact statements… Similarly, the Executive Order's withdrawal of the Council on Environmental Quality's guidance on greenhouse gases [citation provided in original comment], does not—and legally cannot—remove agencies' statutory requirement to fully disclose the potentially significant environmental impacts of greenhouse gas emissions. As the Council on Environmental Quality explained in its withdrawal, the "guidance was not a regulation," and "[t]he withdrawal of the guidance does not change any law, regulation, or other legally binding requirement." [citation provided in original comment] In other words, when the guidance originally recommended the appropriate use of the social cost of greenhouse gases in environmental impact statements [citation provided in original comment], it was simply explaining that the social cost of greenhouse gases is consistent with longstanding NEPA regulations and case law, all of which are still in effect today.	While the BLM cannot know what Executive Order 13783 assumes, the order specifically applies to regulations in stating that, "when monetizing the value of changes in greenhouse gas emissions resulting from regulations, including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates, agencies shall ensure, to the extent permitted by law, that any such estimates are consistent with the guidance contained in OMB Circular A-4 of September 17, 2003 (Regulatory Analysis), Order 13783 (March 28, 2017)…" The coal leasing action is not a change in regulation. Also, see response to Comment #3.
16	Joint NGO Letter	Social Cost of GHG	Generally, uncertainty is not a reason to abandon the social cost of greenhouse gas methodologies; [citation provided in original comment] quite the contrary, uncertainty supports higher estimates of the social cost of greenhouse gases, because most uncertainties regarding climate change entail tipping points, catastrophic risks, and unknown unknowns about the damages of climate change… Moreover, even the best existing estimates of the social cost of greenhouse gases are likely underestimated because the models currently omit many significant categories of damages—such as depressed economic growth, pests, pathogens, erosion, air pollution, fire, dwindling energy supply, health costs, political conflict, and ocean acidification, as well as tipping points, catastrophic risks, and unknown unknowns—and because of other methodological choices [citation provided in original comment]. Consequently, uncertainty suggests an even higher social cost of greenhouse gases and so is not a reason to abandon the metric, which would misleadingly suggest that climate damages are worthless.	Please see the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA.

Comment #	Commenter	Comment Topic	Comment	BLM Response
17	Joint NGO Letter	Global Perspective	BLM mentions the availability of new "interim" estimates of the social cost of greenhouse gases that make changes "to the consideration of domestic versus international impacts and the consideration of appropriate discount rates." [citation provided in original comment] Those two changes are inappropriate and violate the obligations under NEPA to assess environmental consequences. NEPA contains a provision on "International and National Coordination of Efforts" that broadly requires that "all agencies of the Federal Government shall . . . recognize the worldwide and long-range character of environmental problems." [citation provided in original comment] Using a global social cost of greenhouse gases to analyze and set policy fulfills these instructions. Furthermore, the Act requires agencies to, "where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment." [citation provided in original comment] By continuing to use the global social cost of greenhouse gases to spur reciprocal foreign actions, federal agencies "lend appropriate support" to the NEPA's goal of "maximize[ing] international cooperation" to protect "mankind's world environment." Furthermore, not only is it consistent with Circular A-4 and best economic practices to estimate the global damages of U.S. greenhouse gas emissions in regulatory analyses and environmental impact statements, but no existing methodology for estimating a "domestic-only" value is reliable, complete, or consistent with Circular A-4) Since at least 2010, including some recent agency actions under the Trump administration, [citation provided in original comment] federal agencies based their regulatory decision and NEPA reviews on global estimates of the social cost of greenhouse gases. Though agencies sometimes also disclosed a "highly speculative" range that tried to capture exclusively U.S. climate costs, emphasis on a global value was recognized as more accurate given the science and economics of climate change, as more consistent with best economic practices, and as crucial to advancing U.S. strategic goals [citation provided in original comment]....Because greenhouse pollution does not stay within geographic borders but rather mixes in the atmosphere and affects climate worldwide, each ton emitted by the United States not only creates domestic harms, but also imposes large externalities on the rest of the world. Conversely, each ton of greenhouse gases abated in another country benefits the United States along with the rest of the world....it is appropriate under Circular A-4 for agencies to continue to rely on global estimates of the social cost of greenhouses to justify their regulatory decisions or their choice of alternatives under NEPA.	As stated in the EA Section 3.2.3.3, "…confidence in the accuracy of regional- and sub-regional-scale projections is lower than at the global scale. While climate models account for global emissions, they do not provide estimates for impacts from a single source in isolation of other sources." Under Section 1500.1 of the NEPA implementing regulations: "The purpose and function of NEPA is satisfied if Federal agencies have considered relevant environmental information, and the public has been informed regarding the decision-making process. NEPA does not mandate particular results or substantive outcomes. NEPA's purpose is not to generate paperwork or litigation, but to provide for informed decision making and foster excellent action." The BLM has fully satisfied its obligations under NEPA. Although NEPA itself does not contain a provision on international and national coordination of efforts, the U.S. Code chapter 55 on National Environmental Policy states that all federal agencies shall "recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment…" Also see response to Comment #3.

Comment #	Commenter	Comment Topic	Comment	BLM Response
18	Joint NGO Letter		The EA complains that the "range" of estimates for the social cost of greenhouse gases—which is largely a function of using different assumptions about the discount rate—makes the metric not useful [citation provided in original comment]. Not only was this line of thinking rejected by the Ninth Circuit in Center for Biological Diversity—"while . . . there is a range of values, the value of carbon emissions reduction is certainly not zero" [citation provided in original comment]—but the range of values recommended by the Interagency Working Group [citation provided in original comment] and endorsed by the National Academies of Sciences [citation provided in original comment] is rather manageable. In 2016, the IWG recommended values at discount rates from 2.5% to 5%, calculated as between $12 and $62 for year 2020 emissions [citation provided in original comment]. Numerous federal agencies have had no difficulty either applying this range in their environmental impact statements or else focusing on the central estimate at a 3% discount rate [citation provided in original comment]....NEPA requires agencies to weigh the "relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity," as well as "any irreversible and irretrievable commitments of resources." [citation provided in original comment] That requirement is prefaced with a congressional declaration of policy that explicitly references the needs of future generations: The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment . . . declares that it is the continuing policy of the Federal Government . . . to use all practicable means and measures . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans [citation provided in original comment]. The National Academies of Sciences' report also strongly endorses a declining discount rate approach due to uncertainty [citation provided in original comment]. In other words, the rational response to a concern about uncertainty over the discount rate is not to abandon the social cost of greenhouse gas methodology, but to apply declining discount rates and to treat the estimates calculated at a constant 3% rate as conservative lower-bound estimates. ...a 3% or lower discount rate for climate change implies the need for a 300-year horizon to capture all significant values. NAS reviewed the best available, peer-reviewed scientific literature and concluded that the effects of greenhouse gas emissions over a 300-year period are sufficiently well established and reliable as to merit consideration in estimates of the social cost of greenhouse gases [citation provided in original comment].	Please see the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA. A stated in the EA, Section 3.2.3.5, "As applied to the proposed lease modification areas, given the uncertainties associated with assigning an accurate SCC resulting from 3 additional years of operation under the Proposed Action, and given that the SCC protocol and similar models were developed to estimate impacts of regulations over long time frames, this EA quantifies direct and indirect GHG emissions and evaluates these emissions in the context of county, state, and U.S. GHG emissions as discussed in Section 3.2.3.3 of this EA."

Comment #	Commenter	Comment Topic	Comment	BLM Response
19	Southern Utah Wilderness Alliance – Center for Biological Diversity – Sierra Club – WildEarth Guardians (SUWA et al.) Letter	Air quality -methane emissions	The EA arbitrarily uses only the 100 year global warming potential (GWP) for methane instead of also considering the 20-year GWP. BLM also underestimates the methane emissions from the mine ventilation exhaust by having relied on outdated data… BLM failed to consider best management practices and EPA white paper guidance regarding methane emission reductions.	The EPA uses the 100-year time horizon in its Inventory of Greenhouse Gas Emissions and Sinks: 1990-2018 (EPA 2020) and Mandatory Greenhouse Gas Reporting rule. Therefore, project-related emissions are shown based on the 100-year GWP values for comparison to state, national, and global GHG emissions. The GWPs used to calculate CO_2e emissions are based on the IPCC's Climate Change 2014: Synthesis Report for the 100-year timescale (IPCC 2014). The 20-year GWP is sometimes used as an alternative to the 100-year GWP. The 20-year GWP prioritizes gases with shorter lifetimes because it does not consider impacts that happen more than 20 years after the emissions occur. Based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), CH_4 has a lifetime of 12.4 years and a global warming potential of 28 over 100 years. However, for the Lila Canyon EA, the 20-year GWP would not be substantially different from the 100-year GWP because 1) the Lila Canyon Mine is a negligible source of methane; 2) methane in the coal will be converted to CO_2 during the combustion process and the GWP for CO_2 is the same for the both 100 and 20-year GWP; and 3) reporting the 20-year GWP does not change the climate change impacts that were already discussed in Section 3.2.3.6. Methane emissions from the ventilation system were estimated as per 40 CFR Part 98 (MRR of GHG from Underground Coal Mines), Equation FF-1. The flowrate, dry bulb temperature, and barometric pressure (i.e., 88,085 CFM, 52.21 °F and 24.32 in) were based on sample measurements taken quarterly during calendar year 2011 and used as basis for the Lila Canyon Mine NOI dated May 10, 2013. Furthermore, since the ventilation data is based on historic sample measurements, a conservative factor of 2 was applied to the methane emission calculations to account for a potential increase in the methane concentration or ventilation flow rate. A bottle sample taken by MSHA for first quarter fiscal year 2021 showed that the Mine liberated 466,421 cubic feet of methane in 24 hours with airflow of 815,000 cubic feet of air per minute. This calculates to approximately 0.04% methane in the exiting air (BLM 2020c). Differences in air density and number of days the ventilation fans operate may change the total estimate.
20	SUWA et al. Letter	Air quality – indirect emissions	BLM miscalculated the emissions from power plants that will burn the coal removed from the Lila Canyon Mine. And BLM relied on data for sub-bituminous coal but the coal at issue is bituminous, which has higher NOx emissions.	BLM updated the emissions calculations shown in Table 3-10 and Table 3-11 and text in Section 3.2.3.2 of the EA to account for bituminous coal combustion. To estimate the emissions from the combustion of the mined bituminous coal, criteria and hazardous air pollutant (HAP) emission factors from U.S. EPA AP-42 for bituminous and subbituminous coal combustion were obtained. Emission factors for pulverized coal, dry bottom, tangentially fired, bituminous, pre-NSPS firing configuration were used to estimate worst-case combustion emissions from the combustion of the mined coal. NO_x emissions increased in Table 3-10; annual GHG emissions decreased for CO_2 and CO_2e in Table 3-11.
21	SUWA et al. Letter	Air quality – cumulative impacts	BLM ignored numerous other projects in this region that will have cumulative air quality and climate impacts.	The EA has been updated to list past and present actions including coal mining, mineral mining, and oil and gas activity, which contribute to current air quality conditions in the region (Table C-1, Appendix C). This includes an estimate of GHG emissions from oil and gas wells in the BLM PFO and Utah, as well as regional and national emissions, which have been added to Section 3.2.3.6. In addition, a list (Table C-2, Appendix C) of reasonably foreseeable future actions currently known to the BLM PFO, which may contribute to future emissions and climate impacts during the 2- to 3-year extension of the mining activities, has been added to the EA.
22	SUWA et al. Letter	Cumulative impacts	The EA states that the "past and present actions that would affect the resources analyzed in this EA are underground mining operations."2 With regard to reasonably foreseeable future actions the EA identifies other mining projects "in the vicinity" of the lease modification areas."3 This includes a coal lease on SITLA lands, an LBA for Williams Draw, and a coal lease in Walker Flat. 4 These are not the only projects that have had or will have impacts on resources in this region including air quality, climate, water resources, and socioeconomic, among others…. Specifically, the agency failed to identify and analyze past, present, and reasonably foreseeable future actions.	A list of past and present actions has been added to Appendix C (Table C-1) of the EA. Past and present actions are part of the current baseline condition in the vicinity of the Lila Canyon Mine. The list of reasonably foreseeable future actions has been added to Appendix C (Table C-2) of the EA. The BLM has recently completed a report summarizing cumulative greenhouse gas emissions for Utah and the BLM Price Field Office (Utah Bureau of Land Management Air Resource Management Strategy 2020 Monitoring Report). This report is referenced in the EA, Section 3.1, and will be available on BLM's ePlanning site. Statements have been added to the EA Proposed Action cumulative effects sections to address the additional reasonably foreseeable future actions listed in Appendix C. Also, see response to Comment #21.

Comment #	Commenter	Comment Topic	Comment	BLM Response
23	SUWA et al. Letter	Cumulative impacts	Before BLM can identify past, present, and reasonably foreseeable future actions, it must first establish its "cumulative impacts analysis area," or CIAA. …BLM never defined the CIAA for air quality or climate.	The cumulative effects analysis area for air quality and greenhouse gas emissions is identified in Section 3.2 of the EA and includes the near-field criteria pollutant assessment of 50 km. The air quality modeling domain includes Emery and Carbon Counties. The BLM also looked at the nearby Class I areas at the extent of the domain. For GHG, BLM looked at a global impact area (national and global scale emissions and modeling).
24	SUWA et al. Letter	Past, Present, and Reasonably Foreseeable Future Actions	BLM identified only four past, present, or reasonably foreseeable actions [citation provided in original comment]. These are not the only projects that have or will impact the resources considered in the EA, including air quality and climate.… BLM has approved similar coal lease modifications for, at least, five other projects in Utah.… BLM has issued hundreds of oil and gas leases for development in Utah including in and near Carbon County… BLM has approved development projects that will impact air quality and climate, among other resources… And there are other ongoing large-scale proposals that will impact these same resources. …The EA does not identify these projects, even though each project will impact air quality, climate, water, and socioeconomic resources, among others	See responses to Comments #21 and #22. The coal lease modification projects mentioned in the comment have decision dates between 2009 and 2018, and for the air quality discussion, their emissions would be part of the affected environment. Oil and gas development is discussed in Section 3.5 of the EA; additional information has been added to the cumulative effects analysis (EA Section 3.2.3.6 and Appendix C).
25	SUWA et al. Letter	Cumulative impacts	In addition to identifying past, present, and reasonably foreseeable actions that might affect the environment in the project area, BLM must analyze the cumulative impacts of those actions in combination.… these projects and their cumulative impacts must be considered in the EA. This includes whether the proposed action—when viewed together with these other projects—may violate any NAAQS, or consideration of the total climate impact of these projects. It also includes the cumulative impacts to socioeconomics, water resources, and other resource impacts such as wildlife species.	See response to Comment #21. If the resource analysis for a specific resource shows no direct or indirect impacts, then no cumulative impact analysis is needed for that resource. Predictions of violations of the NAAQS are not the purview of BLM's NEPA EA. The Utah Division of Air Quality is responsible for commercial and industrial air quality permitting, compliance, and enforcement. The EA does not evaluate violations, but rather the potential for exceedances. For the NAAQS, a violation has a specific meaning, primarily being that the three-year average of the standard exceeded the NAAQS. The EA does not look at three-year averages but rather the potential to exceed during a given year.
26	SUWA et al. Letter	Social Cost of Carbon	The social cost of carbon provides an estimate of the economic damage, in dollars, caused by each incremental ton of carbon dioxide emitted into the atmosphere, including impacts such as increased drought, wildfires, decreased agricultural productivity, and sea level rise, among others [citation provided in original comment]. By translating climate impacts, and tons of greenhouse gasses in particular, into dollars, the social cost of carbon offers BLM an easy to use and easy to understand tool that would allow the public and decisionmakers to better understand the climate impacts of BLM's decision here. …The social cost of greenhouse gases remain valid and generally-accepted scientific tools that BLM should have used pursuant to 40 C.F.R. §§ 1500.1(b) and 1502.22 to monetize the impact of GHG emissions in its estimation of the Mine's economic impacts [citation provided in original comment].	Please see the response to Comment #3 for reasons why the BLM did not monetize climate effects in this EA.

Comment #	Commenter	Comment Topic	Comment	BLM Response
27	SUWA et al. Letter	Global carbon budget	BLM must acknowledge and address the extent to which the proposed action conflicts with our national emissions reduction goals and international climate commitments, including internationally-agreed upon carbon budgets…. the 2018 IPCC Special Report provides overwhelming scientific evidence for the necessity of immediate, deep greenhouse gas reductions across all sectors to avoid devastating climate change-driven damages, and underscores the high costs of inaction or delays, particularly in the next crucial decade, in making these cuts…. BLM must address the recent studies and reports on the concept of global carbon budgeting, which was not addressed by BLM in this NEPA review or in the Lifting the Pause on the Issuance of New Federal Coal Leases for Thermal (Steam) Coal EA (a carbon budget alternative was proposed but rejected by the agency [citation provided in original comment]). Furthermore, BLM must evaluate how the direct and indirect greenhouse gas emissions associated with the proposed Lila Canyon Mine lease modifications affect the remaining available carbon budget.	Analysis of the Proposed Action within the context of the U.S. production gap or emission gap between current fossil fuel production and climate goals is outside of the scope of the Proposed Action because the BLM leases represent a subnational portion of fossil fuel production and GHG emissions, which is in effect, driven by regional supply and demand. Large-scale changes in energy use trends are generally driven by federal or state-level regulations such as renewable portfolio standards or other relevant requirements that are designed to increase renewable energy supply. The BLM's rejection of mining of federal coal would have little to no impact on the overall coal supplied as applicants would be likely to simply mine other coal tracts to provide coal in a less-efficient manner than the logical mining sequence if the federal coal lease is approved. Additionally, presenting the emissions data in comparison with the production or emission gap information does not provide the decision-maker and the public any more context of the significance of impacts when compared to disclosing the relative magnitude of GHG emissions at multiple geographic scales as a proxy for climate change impacts. Use of the latter methodology is more consistent with the draft 2019 NEPA guidance on consideration of GHG emissions and is the most consistent methodology by which impacts are presented and evaluated across BLM field offices. GHG emissions for the Proposed Action have been quantified and have provided various contextual comparisons (including geographic comparisons at the regional, state, national, and global levels). Carbon budgeting is a simplified approach for identifying how much additional CO_2 emissions the atmosphere can accept in order to limit global warming to a certain temperature above pre-industrial levels (2.0°C for Paris Agreement, 1.5°C for IPCC 2018 Special Report). The carbon budget was developed as a tool to assist policy makers in reducing GHG emissions on national and global scales. There is no requirement or mechanism to apply a worldwide carbon budget to a site-specific project such as the Proposed Action. Carbon budgets do not currently exist at the national or state level, and creating such a budget is beyond the scope of this EA. While a carbon budget sounds like a simple tool, there is a lot of complexity and uncertainty to it that make it confusing to the decision-maker and public. There are multiple carbon budgets to choose from, each representing a different amount of global warming. Even for a carbon budget that limits warming to 1.5°C, scientists have struggled to agree on the size of the budget. According to the Intergovernmental Panel on Climate Change (IPCC) 2018 Special Report (SR), "uncertainties in the size of these estimated remaining carbon budgets are substantial." The IPCC SR estimates the budget for a 50/50 chance of exceeding 1.5°C at 580 gigatonnes of CO_2 ($GtCO_2$), with an uncertainty of ±400$GtCO_2$. This uncertainty is nearly 70% of the budget. The uncertainty results from what the precise meaning of the 1.5°C target is, definition of what "surface temperature" means, definition of the "pre-industrial" period, what observational temperature dataset to use, uncertainty in non-CO_2 factors that influence warming, and if earth-system feedbacks should be taken into account. With the large uncertainty in the remaining carbon budgets, it is not a useful tool for evaluating a GHG emissions significance level at this time. Additionally, carbon budgets are inherently reduced with any GHG emissions. Based on the disclosed GHG emissions in the EA and the substantial uncertainties in the size of carbon budgets, inclusion of carbon budgets would not provide additional useful information to the decision-maker or the public. The IPCC SR further states that policy actions across sectors and spatial scales are needed to reduce emissions and limit warming. Evaluations of such policy actions are beyond the scope of this EA.

Comment #	Commenter	Comment Topic	Comment	BLM Response
28	SUWA et al. Letter	Methane global warming potential	BLM's failure to calculate CO2e for methane based on the 20-year GWP is an important omission because methane has greater radiative forcing (i.e., a greater capacity to warm the atmosphere), but a shorter atmospheric lifetime, than CO2, and is therefore a more potent greenhouse gas in the near-term. In the EA, BLM utilized only a single methane GWP of 28, reporting annual methane emissions (direct, indirect, and indirect from coal combustion) [citation provided in original comment] of 2,927 tons per year [citation provided in original comment]. Although BLM does not specify the combined CO2e for methane, using BLM's outdated 100-year GWP of 28 yields disclosed methane emissions of 81,956 tons CO2e per year (2927 x 28). Even using the range of EPA values for methane GWP for both 100-year and 20-year GWP, however, yields far greater CO2e: 81,956 – 105,372 annual tons CO2e using the 100-year GWPs; 245,868 – 254,649 annual tons CO2e using the 20-year GWPs [citation provided in original comment]. Instead BLM only applied an outdated 100-year GWP of 28. Application of the 20-year GWPs yields at least three times the amount of CO2e for methane emissions than BLM disclosed in the EA, even using the low-end estimate of 84 for the 20-year GWP. Thus, BLM must disclose the most current IPCC-20- and 100-year GWPs for fossil methane.	The EPA uses the 100-year time horizon in its Inventory of Greenhouse Gas Emissions and Sinks: 1990-2018 (EPA 2020h) and Mandatory Greenhouse Gas Reporting rule. Therefore, project-related emissions are shown based on the 100-year GWP values for comparison to state, national, and global GHG emissions. The GWPs used to calculate CO_2e emissions are based on the IPCC's Climate Change 2014: Synthesis Report for the 100-year timescale, which are the most recent GWPs available (IPCC 2014). However, for the Lila Canyon EA, the 20-year GWP would not be substantially different from the 100-year GWP because 1) the Lila Canyon Mine is a negligible source of methane; 2) methane in the coal will be converted to CO_2 during the combustion process and the GWP for CO_2 is the same for the both 100 and 20-year GWP; and 3) reporting the 20-year GWP does not change the climate change impacts that were already discussed in Section 3.2.3.6.
29	SUWA et al. Letter	Wildlife	…there has not been any meaningful consideration of potential indirect and cumulative impacts to plants and animals or their habitat stemming from the proposed lease modifications…any potential indirect and cumulative impacts, including but not limited to those discussed above, to the federally listed Mexican spotted owl, humpback chub, razorback sucker, bonytail, and Colorado pikeminnow must be considered. ..BLM has the same duty to consider potential impacts to the Horse Canyon stickleaf, a BLM-sensitive species	As stated in Appendix A of the EA, no surface disturbance is proposed, and no surface expression of subsidence is anticipated from the two proposed lease modifications. Due to the existing monitoring and response plan and the anticipated lack of surface disturbance, no impacts to sensitive wildlife populations or their habitat are expected. Analysis of soils, geology, elevation, and ecological systems overlying the proposed lease modification areas indicates the potential for suitable habitat for *Mentzelia multicaulis* var *librina* (Horse Canyon stickleaf). There are possible exposures of suitable geology, Price River Formations, and it is close to the typical elevation. Although suitable habitat for this plant occurs, there would be no impacts to habitat because no surface disturbance is proposed or anticipated. Due to the depth of the coal resource and therefore the coal mining activity in the lease modification areas, and the lack of surface disturbance, no impacts to fish populations or their habitat from the proposed underground mining operations are expected, as explained in the ID Team checklist (see EA Appendix A). The ID Team Checklist (Appendix A) has been updated to identify the potential for impacts to federally listed fish. Applicable analysis has been added to the EA. Appendix E has also been added to address the potential for indirect impacts on federally listed fish from mercury and selenium deposition from coal combustion at local power plants.
30	SUWA et al. Letter	Wildlife	BLM here failed to conduct, collect, or examine adequate current baseline studies for wildlife species and their habitat,	See response to Comment #29.
31	SUWA et al. Letter	ESA	…it is not evident that BLM requested from FWS whether any listed or species proposed for listing under the ESA are present in the proposed action area…. there has not been any ESA compliant consultation and analysis of all consequences to listed (or potentially listed) species and their habitat stemming from the proposed lease modifications.	The IDT checklist (EA Appendix A) references the U.S. Fish and Wildlife Service Information, Planning and Consultation (IPaC) system coordination. The IDT checklist has been updated to add additional detail. The BLM fulfilled its obligations under the ESA. The BLM determined that there may be potential indirect impacts to federally listed fish. Applicable analysis has been added to the EA. Appendix E has also been added to address the potential for indirect impacts on federally listed fish from mercury and selenium deposition. Informal consultation with the U.S. Fish and Wildlife Service concluded in concurrence with BLM's 'may affect but not likely to adversely affect' determination for indirect effects to Colorado River endangered fish and their critical habitats (Appendix E).
32	SUWA et al. Letter	ESA - MSO	While the EA acknowledges that "Mexican spotted owl (Strix occidentalis lucida) [MSO]– Designated critical [sic] occurs within the proposed lease modification areas," [citation provided in original comment] it provides no further information about the species, its habitat, or its status within and adjacent to the proposed lease modification areas…. BLM and FWS appear to have never meaningfully analyzed the potential effects of the Lila Canyon Mine and these proposed leased modifications on the species and/or its critical habitat.	The IDT checklist (EA Appendix A) has been updated to provide additional analysis of MSO and its critical habitat. Also, see Appendix E, correspondence from the U.S. Fish and Wildlife Service.

Comment #	Commenter	Comment Topic	Comment	BLM Response
33	SUWA et al. Letter	ESA - fish	…using the county in which the Lila Canyon Mine falls as the analysis area is arbitrary and ignores regional effects to federally listed species and their habitat that would stem from the proposed lease modifications, such as mercury and selenium deposition from coal combustion. Furthermore, the EA categorically dismisses that there may be any impacts to fish from the lease modifications [citation provided in original comment]. Such a cursory dismissal falls far short of ESA-compliant analysis…. That mercury emissions from the Hunter and Huntington power plants may affect the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail is illustrated by a series of maps prepared by WildEarth Guardians using the Environmental Protection Agency's Regional Modeling System for Aerosols and Deposition protocol, or REMSAD, and relying on the agency's methods [citation provided in original comment]. Based on this model, Guardians modeled that the Hunter power plant contributes 5.37% of total mercury deposition in the Green River Basin, with Huntington contributing 19.52%. More detailed modeling of the individual power plants also shows that both power plants' mercury deposition footprints are more heavily concentrated in the Green River watershed, particularly in the Huntington Creek and Price River drainages [citation provided in original comment]. By failing to consult with the FWS about potential effects to the endangered Colorado pikeminnow, razorback sucker, humpback chub, and bonytail and their critical habitat, the agency has violated Section 7 of the ESA.	See response to Comment #31. There would be no impacts to fish species or their habitat from the proposed underground mining operations because of the depth of the coal and because neither fish nor perennial surface waters exist in the lease modifications areas. The ID Team Checklist (Appendix A) has been updated to identify the potential for impacts to federally listed fish. Applicable analysis has been added to the EA. Appendix E has also been added to address potential indirect impacts on federally listed fish from mercury and selenium deposition. Please see Appendix A of the EA and Section 3.4 of the EA for the surface water resources analysis. Emissions from the Hunter and Huntington power plants are regulated under State of Utah permits. The EA acknowledges that it is likely that some of the coal mined from the lease modification areas would be combusted at the Hunter or Huntington power plants. The proposed lease modifications and operation of Hunter and Huntington power plants are not interrelated nor interdependent. Specifically, even though the most logical use for the coal is the local market, the leasing does not depend upon operation of the power plants (there are other markets for the coal), nor does operation of the power plants depend upon issuance of the lease modification (there are other sources of coal available for purchase). The EA has been updated with a review of potential indirect impacts to the Colorado River endangered fish. BLM has consulted informally with the U.S. Fish and Wildlife Service (See Appendix A and Appendix E).
34	SUWA et al. Letter	Best available science	BLM presented little to no evidence that the proposed action will not affect threatened and endangered species like the Mexican spotted owl and Colorado River endangered fishes, and their critical habitats, the agency has not complied with the ESA's mandate to apply the best available science. BLM must clearly demonstrate that its decision is based on analysis of the best available science as the ESA requires.	See response to Comments #31 and #33.
35	SUWA et al. Letter	Outdated information and data	The BLM must update its data and analysis in the EA to incorporate the 2019 Lila Canyon Mine Annual Report (2019 Report) [citation provided in original comment] and cannot continue to rely on the outdated 2018 Lila Canyon Mine Annual Report (2018 Report) [citation provided in original comment]. NEPA requires BLM to rely on accurate, up-to-date, scientific information and data [citation provided in original comment]…. The 2019 Report was provided to the Utah Division of Oil, Gas and Mining on March 11, 2020—nearly two months before BLM released the draft EA [citation provided in original comment]. BLM fails to meet NEPA's informed decision-making mandate when it relies on unrepresentative information and data [citation provided in original comment].	The EA was completed based upon the use of reliable existing data and resources. The BLM reviewed and considered the 2019 report data.
36	SUWA et al. Letter	Range of alternatives	SUWA recommends the following alternatives, each of which will accomplish BLM's stated objectives, are technically and economically feasible, and will reduce impacts to the environment: • A "moderate expansion" alternative. Under this alternative, BLM would expand UEI's existing lease to include UTU-014218, adding approximately 317 acres to the Lila Canyon mine. BLM would not lease UTU-0126947. This alternative would differ from the proposed action alternative in several ways, including the amount of recoverable coal, scope of coal mining activities, and environmental impacts. Notably, this alternative would reduce GHG emissions. • A "methane emissions reduction" alternative. Under this alternative, BLM would lease both UTU-014218 and UTU-0126947 and also require implementation of the best management practices and methane emissions reduction strategies discussed in Ms. Williams' air quality report [citation provided in original comment]. This alternative differs from the proposed action alternative in that it would reduce the GHG emissions and climate impacts of the proposed action alternative.	Under the 43 CFR 3400 rules, the BLM is responsible for responding to a lease modification application by ensuring, among other things, the recoverability of the coal resource and that the plans to mine and extract coal do not jeopardize other coal resources or cause the bypass of valuable federal coal reserves. Coal tracts must be logically delineated and maximum economic recovery of the coal resource is required based upon current mining technology. For these reasons, the "moderate expansion" alternative would not be considered for this EA. Methane has been measured as undetectable at the Lila Canyon Mine vents and thus a methane reduction alternative was not considered. The NEPA directs the BLM to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources…" No such unresolved conflicts of available resources are present in this case, and no other action alternatives are justifiable.
37	SUWA et al. Letter	Information documentation	The EA does not comply with 40 C.F.R. § 1506.5 because BLM has not independently evaluated the accuracy of documentation cited therein, nor does BLM even know where to find the documentation…. In its request to BLM, SUWA asked for the documentation verifying that BLM has independently evaluated and verified the accuracy of Lila Canyon Mine's information regarding the methane and VOC concentrations in the ventilation exhaust. Despite multiple requests from SUWA to BLM, the agency never released the documentation indicating that BLM had independently evaluated the information provided by Lila Canyon Mine. In fact, BLM could not even locate Lila Canyon Mine's methane and VOC concentration information by the end of the public comment period.	BLM verified independent sources for the methane and VOC data and evaluated the full extent of analyses in the EA. The EA is in compliance with 40 CFR 1506.5, which states: "The agency shall independently evaluate the information submitted or the environmental document and shall be responsible for its accuracy, scope, and contents." The BLM made the requested information available on ePlanning on May 8, 2020; the BLM extended the public comment period 2 weeks to allow for review of the supporting information.

Comment #	Commenter	Comment Topic	Comment	BLM Response
38	SUWA et al. Letter	Soils	…BLM failed to explain the composition of soils in the project area and never explained how subsidence and erosion would or would not impact the soils.	The conclusion is made in the EA and ID Team Checklist (Appendix A) that based on the depth of the coal seam from 2,000 to 3,000 feet, surface expression of subsidence should not be evident or measurable in the lease modification areas. Because of this, there would be no impacts to soils and thus soils are not described in detail in the EA. Subsidence is described in Section 2.4.2.3 of the EA. The surface water analysis is in Section 3.4 of the EA. The natural forces of erosion due to weathering and precipitation occur regardless of underground mining; see Section 3.4.3.1 of the EA for a statement on the role of natural erosion as related to subsidence.
39	SUWA et al. Letter	Vegetation	… with impacts to vegetation, the EA merely concludes in the ID Team Checklist that "[t]here is no new surface disturbance proposed or anticipated. Therefore, detailed analysis is not required." …Instead, BLM must analyze the connection between groundwater and vegetation, subsidence, and any pollution from the Proposed Action that could impact vegetation in the project area.	The ID Team Checklist (Appendix A) has been updated to clarify that based on the depth of the coal seam from 2,000 to 3,000 feet, no surface expression of subsidence is anticipated. A color infrared aerial photography study is also conducted as part of DOGM monitoring commitments under the Lila Canyon Mine permit approval. The study monitors impacts of subsidence on surface vegetation communities. The baseline data was gathered in 2011, and the study was repeated in 2016 per the 5-year interval requirement. No differences were observed between 2011 and 2016, suggesting that if subsidence occurred, it has had little impact to the plant and soil communities at the Lila Canyon Mine. The BLM considered soils, geology, elevation, and ecological systems within the proposed lease modification areas to determine surface resources requiring detailed analysis. As noted, vegetation is not a resource requiring detailed analysis in this EA.
40	SUWA et al. Letter	Visual resources	BLM has not analyzed the visual impacts from the "64-mile round trip along designated truck routes from the SCT to a regional coal-fired power plant, with an average capacity of 46 tons of coal per truck and a maximum of 11.2 trucks per hour (4.5 million tons of coal per year)." [citation provided in original comment] The Proposed Action takes place in an area classified as visual resource management (VRM) I.	As described in the IDT checklist in Appendix A of the EA, "Since no surface disturbance is proposed or anticipated, there will be no impact to visual resources and the existing character of the landscape will be maintained. Detailed analysis of visual resources is not required." The existing above ground facilities are within VRM classes 2 and 3. Approximately 0.3 mile of the county-maintained Lila Canyon Road is within VRM class 2, and the remaining 4.9 miles are within VRM class 3. Daily traffic along the Lila Canyon Road to U.S. Highway 6 is not anticipated to increase because the lease modification does not increase the amount of material that the permit holder can remove. Impacts to visuals would not change from previous NEPA analyses. The development of the Lila Canyon Mine surface facilities was analyzed in the BLM's Lila Canyon Project EA (BLM 2000) and referenced in the Lila Canyon Mine Lease Modifications EA (Section 2.4.2.1 and Section 3.1).

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APPENDIX G

List of Preparers

LIST OF PREPARERS

List of BLM and Non-BLM Preparers and Reviewers

Name	Title	EA Document Responsibility
BLM Preparers and Reviewers		
Michael Glasson	Geologist, Solid Minerals Lead, PFO	Project management, document review, geology/minerals/ energy production
Rebecca Anderson	Geologist, PFO	Document review and geology
Chris Conrad	Field Office Manager, PFO	Document review
Joseph Rodarme	NEPA Specialist, PFO	NEPA compliance, document review
Stephanie Howard	NEPA Lead, Vernal FO	Socioeconomics, NEPA compliance, document review
Erik Vernon	Air Quality Specialist, BLM State Office	Air quality and greenhouse gas emissions
Jared Dalebout	Hydrologist, BLM State Office	Ground water and surface water
Dana Truman	Assistant Field Manager, Resources, PFO	Special status species and ESA compliance
Jerrad Goodell	Aquatic Ecologist, Vernal FO	Surface water and fish habitat
Non-BLM Preparers and Reviewers		
Office of Surface Mining Reclamation and Enforcement		
Gretchen Pinkham	Natural Resources Specialist	Document review
SWCA Environmental Consultants		
David Steed	Director - Mining	Project management and QA/QC
Jeremy Eyre	Planner/NEPA Specialist	Chapters 1-2 and Socioeconomics
Linda Gottschalk	Permitting/NEPA Specialist	Project management and document review
Andrew Harley, PhD	Senior Mining Lead	Water resources review
KayLee Lavery	Natural Resources Planner	Administrative record
Kerri Linehan	Technical Editor	Technical editing
Gretchen Semerad	Environmental Scientist	Air quality and greenhouse gas emissions
Debbi Smith	Desktop Publishing and Production Coordinator	Formatting and Section 508
Brad Sohm, P.E.	Senior Air Quality Specialist	Air quality review
Calah Worthen	Water Resources Specialist	Water resources

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APPENDIX H

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APPENDIX 1-10a

State Coal Leases

Director's Agenda 9/4/2018 MINERAL LEASE NO. ML-53812-OBA

FUND: **SCH**

UTAH STATE LEASE FOR COAL

THIS COAL MINING LEASE AND AGREEMENT (the "Lease") is entered into and executed in duplicate as of October 1, 2018 (the "Effective Date") by and between the STATE OF UTAH, acting by and through the SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION, 675 East 500 South, Suite 500, Salt Lake City, Utah 84102 ("Lessor"), and UTAH AMERICAN ENERGY, INC., a Utah corporation, 794 N. "C" Canyon Road, P.O. Box 910, East Carbon, Utah 84520 ("Lessee")

WITNESSETH:

That the State of Utah, as Lessor, in consideration of the rentals, royalties, and other financial consideration paid or required to be paid by Lessee, and the covenants of Lessee set forth below, does hereby GRANT AND LEASE to Lessee the exclusive right and privilege to explore for, drill for, mine, remove, transport, convey, cross-haul, commingle, and sell the coal contained within the boundaries of the following described tract of land (the "Leased Premises") located in Emery County, State of Utah:

Township 16 South, Range 14 East, SLB&M
Section 36: All

Township 16 South, Range 15 East, SLB&M
Section 32: All

(containing 1280 acres, more or less)

Together with the right and privilege to make use of the surface (but only to the extent owned by Lessor) and subsurface of the Leased Premises for uses incident to the mining of coal by Lessee on the Leased Premises or on other lands under the control of Lessee or mined in connection with operations on the Leased Premises, including, but not limited to, conveying, storing, loading, hauling, commingling, cross-hauling, and otherwise transporting coal; excavating; removing, stockpiling, depositing and redepositing of surface materials; and the subsidence, mitigation, restoration and reclamation of the surface.

This Coal Mining Lease and Agreement is subject to, and Lessee hereby agrees to and accepts, the following covenants, terms, and conditions:

1. LEASED MINERALS.

1.1 Coal. This mineral lease covers coal, which shall mean and include black or brownish-black solid fossil fuels that have been subjected to the natural processes of coalification, and which fall within the classification of coal by rank as anthracitic, bituminous, sub-bituminous, or lignitic, together with closely associated substances which include, but are not limited to other hydrocarbon substances physically contained within the same geologic strata as the coal. In the event that minerals other than coal are discovered during lease operations, Lessee shall promptly notify Lessor.

1.2 Coalbed Methane. To the extent that Lessor owns gas, coalbed methane or coal seam gas (collectively "coalbed methane") within the Leased Premises, Lessee may vent, or flare such coalbed methane from the coal strata being mined and any overlying formations if such removal is necessary for safety reasons in the reasonable discretion of Lessee. If Lessee captures or uses such coalbed methane (including capture or flaring for the purpose of generating greenhouse gas credits or other environmental attributes), it shall pay Lessor royalties on the value of such coalbed methane at the prevailing state royalty rate for natural gas, unless such royalties are expressly waived by Lessor. In the event that Lessor does not own gas or coalbed methane within the Leased Premises, or Lessor has granted the rights to gas or coal bed methane in the Leased Premises to another party, Lessee must obtain the consent of the owner or lessee of such coalbed methane prior to removal or capture of such gas. Except as expressly granted herein, the right to extract gas, coalbed methane and coal seam gas is not granted by this Lease.

1.3 No Warranty of Title. Lessor claims title to the mineral estate covered by this Lease. Lessor does not warrant title nor represent that no one will dispute the title asserted by Lessor. It is expressly agreed that Lessor shall not be liable to Lessee for any alleged deficiency in title to the mineral estate, nor shall Lessee become entitled to any refund for any rentals, bonuses, or royalties paid under this Lease in the event of title failure.

2. RESERVATIONS TO LESSOR. Subject to the exclusive rights and privileges granted to Lessee under this Lease, and further provided that Lessor shall refrain from taking actions with respect to the Leased Premises that may unreasonably interfere with Lessee's operations, Lessor hereby excepts and reserves from the operation of this Lease the following rights and privileges (to the extent that Lessor has the right to grant such rights and privileges):

2.1 Rights-of-Way and Easements. Lessor reserves the right, following consultation with the Lessee, to establish rights-of-way and easements upon, through or over the Leased Premises, under terms and conditions that will not unreasonably interfere with operations under this Lease, for roads, pipelines, electric

transmission lines, transportation and utility corridors, mineral access, and any other purpose deemed reasonably necessary by Lessor.

2.2 Other Mineral Leases. Lessor reserves the right to enter into mineral leases and agreements with third parties covering minerals other than coal, under terms and conditions that will not unreasonably interfere with operations under this Lease in accordance with Lessor's regulations, if any, governing multiple mineral development.

2.3 Use and Disposal of Surface. To the extent that Lessor owns the surface estate of the Leased Premises and subject to the rights granted to the Lessee pursuant to this Lease, Lessor reserves the right to use, lease, sell, or otherwise dispose of the surface estate or any part thereof. Lessor shall notify Lessee of any such sale, lease, or other disposition of the surface estate.

2.4 Previously Authorized Improvements. If authorized improvements have been placed upon the Leased Premises by a third party prior to the commencement of this Lease, Lessee shall allow the owner of such improvements to remove them within ninety (90) days after the Lease term commences. Nothing in this paragraph shall authorize Lessee to remove surface improvements where Lessor does not own the surface estate.

2.5 Rights Not Expressly Granted. Lessor further reserves all rights and privileges of every kind and nature, except as specifically granted in this Lease.

3. TERM OF LEASE; READJUSTMENT.

3.1 Primary Term. This Lease is granted for a "primary term" of ten (10) years commencing on the Effective Date and for a "secondary term" of an additional ten (10) years, subject to Lessee's compliance with the requirements of paragraph 3.3, Diligent Operations; Minimum Royalty.

3.2 Extension Beyond Secondary Term. Subject to Lessee's compliance with the other provisions of this Lease, this Lease shall remain in effect beyond the secondary term and for as long thereafter as coal is produced in commercial quantities from the Leased Premises, or from lands constituting either (i) a logical mining unit approved by the Bureau of Land Management containing the Leased Premises, or (ii) a mining unit, in which the recoverable coal reserves can be developed in an efficient, economical and orderly manner as a unit with due regard to the conservation of recoverable coal reserves. The second type of mining unit requires a determination by the Lessor that the criteria set forth in item (ii) have been satisfied. The satisfaction of either (i) or (ii) above shall mean that the Lease is contained within an "approved mining unit." For the purposes of this Lease, production of coal in commercial quantities shall mean production during each lease year of at least one per cent (1%) of the original recoverable

coal reserves within the Leased Premises or within lands constituting an approved mining unit which includes the Leased Premises, as such recoverable coal reserves are determined by Lessor after consultation with Lessee, subject to adjustment from time to time based upon reasonable justification from the Lessee.

3.3 Diligent Operations; Minimum Royalty. In the absence of actual production in commercial quantities as set forth in paragraph 3.2, Extension Beyond Secondary Term, this Lease shall remain in effect beyond the primary term only if the Lessee is engaged in diligent operations, or development activity (which development activity shall include, but not be limited to, pursuit of required permits and approvals), which in Lessor's reasonable discretion is calculated to advance development or production of coal from the Leased Premises or lands constituting an approved mining unit which includes the Leased Premises, and Lessee pays an annual minimum royalty in advance on or before the anniversary date of the Effective Date. The minimum royalty shall be calculated by determining the production royalty that would be payable upon production of one per cent (1%) of the original recoverable coal reserves within the Leased Premises, as such recoverable coal reserves are determined by Lessor after consultation with Lessee, subject to adjustment from time to time based upon reasonable justification from the Lessee. The unit value of the recoverable coal reserves for purposes of determining the minimum royalty shall be determined by Lessor using the methodology set forth in 43 Code of Federal Regulations Section 3483.4(c)(1)-(3) (1998). Minimum royalties paid by Lessee pursuant to this paragraph may be credited against production royalties accruing during the term of this Lease.

3.4 Expiration; Cessation of Production. This Lease may not be extended pursuant to paragraph 3.3, Diligent Operations; Minimum Royalty, beyond the end of the twentieth year after the Effective Date except by the actual production of coal in commercial quantities from the Leased Premises or from lands constituting an approved mining unit which includes the Leased Premises. After expiration of the secondary term, this Lease will expire of its own terms, without the necessity of any notice or action by Lessor, if Lessee ceases production of coal in commercial quantities for an entire lease year, unless the Lease is suspended pursuant to paragraph 16.3, Suspension.

3.5 Readjustment. At the end of the primary term and at the end of each ten-year period that this lease is in effect, Lessor may readjust the terms and conditions of this Lease (including without limitation rental rates, minimum royalties, royalty rates and valuation methods, and provisions concerning reclamation). If within thirty (30) days after submission of the readjusted lease terms to the Lessee, the Lessee determines that any or all of the proposed readjusted terms and conditions are unacceptable, then Lessee shall so notify Lessor in writing and the parties shall attempt to resolve the objectionable term or condition. If the parties are unable to resolve the matter and agree upon the readjusted terms and conditions

submitted by Lessor at the end of such ten (10) year period, Lessee shall forfeit any right to the continued extension of this lease, and the lease shall automatically terminate, provided that nothing herein shall be deemed to preclude Lessee from appealing any readjustment by Lessor pursuant to applicable law

3.6 Relinquishment. Lessee may relinquish all or portions of this Lease at any time by filing a written notice of relinquishment with Lessor. Lessor may disapprove any relinquishment if Lessee has failed to pay all rentals, royalties, and other amounts due and owing to the Lessor, if the lease is otherwise not in good standing, or if relinquishment would in Lessors' reasonable determination cause waste of economically recoverable coal. Lessee may not relinquish parcels smaller than a quarter-quarter section or surveyed lot. Upon approval, relinquishment shall relieve the Lessee of all future rental obligations as to the relinquished lands effective as of the date of filing of the relinquishment, but shall not relieve Lessee from other obligations to the extent provided in paragraph 15.2, Effect of Termination.

4. BONUS. Lessee agrees to pay Lessor an initial bonus in the total amount of $50,000 ("Initial Bonus"), payable on or before the Effective Date. The Initial Bonus shall be credited to the Production Royalties under paragraph 6.1. In addition to the Initial Bonus, Lessee shall also pay Lessor a deferred bonus (the "Deferred Bonus") for all coal severed and removed from the Leased Premises, payable on a per ton basis, contemporaneously with and in addition to production royalties for such coal payable under paragraph 6.1, Production Royalties. The Deferred Bonus will be $0.416/per ton of coal produced and sold from the Leased Premises.

5. RENTALS. Lessee agrees to pay Lessor an annual rental of three dollars ($3.00) for each acre and fractional part thereof within the Leased Premises. Lessee shall promptly pay annual rentals each year in advance on or before the anniversary date of the Effective Date. Lessee may not credit rentals against production royalties or against minimum royalties payable pursuant to paragraph 3.3, Diligent Operations; Minimum Royalty.

6. ROYALTIES.

6.1 Production Royalties. Lessee shall pay Lessor a production royalty of eight per cent (8%) of the value of all coal severed and removed from the Leased Premises by underground mining methods and twelve and one-half per cent (12.5%) of the value of all coal severed and removed from the Leased Premises by surface mining methods. For all coal sold pursuant to an arm's-length contract, value shall be determined on the basis of the gross proceeds received by Lessee from the sale or disposition of such coal. Gross proceeds shall include all bonuses, allowances or other consideration of any nature received by Lessee for coal actually produced. For any coal that is sold or disposed of other than by an arms-length contract, or for coal that is used within the mine permit area containing the Leased Premises for generation of electricity or for gasification,

liquefaction, in situ processing, or other method of extracting energy from such coal, the value of such coal shall be determined by Lessor with reference to (in order of priority): (i) comparable arms-length contracts or other dispositions of like-quality coal produced in the same coal field; (ii) prices reported for that coal to a public utility commission; (iii) prices reported to other governmental agencies; or (iv) other relevant information.

6.2 Allowable Deductions. It is expressly understood and agreed that none of Lessee's mining or production costs, including but not limited to costs for materials, labor, overhead, distribution, transportation within the mine permit area prior to the point of sale, loading, crushing, sizing, screening, or general and administrative activities, may be deducted in computing Lessor's royalty. All such costs shall be entirely borne by Lessee and are anticipated by the rate of royalty set forth in this Lease. In the event that the point of sale for coal produced from this Lease is located outside the mine permit area boundary, Lessee may deduct the reasonable, actual costs of transportation of such coal from the mine permit area boundary to the point of sale from gross proceeds in computing Lessor's royalty; provided, however, that transportation deductions for coal transported by Lessee, Lessee's affiliates, or by non-arm's-length contract are subject to review and modification by Lessor. Lessee shall be allowed to deduct its actual, reasonable washing and treatment costs from gross proceeds in computing Lessor's royalty; provided, however, that, upon Lessor's request Lessee shall provide to Lessor appropriate justification to demonstrate that Lessee's costs are reasonable.

6.3 Reference to Federal Regulations. It is the intent of Lessor and Lessee that the calculation of the value of coal for royalty purposes be consistent with federal coal regulations governing the valuation of coal, except where this Lease expressly provides otherwise. In no event shall the value of coal used for calculation of royalties under this Lease be less than the value which would be obtained were federal royalty valuation regulations applied.

6.4 Royalty Payment. For all coal severed and removed from the Leased Premises that is used, sold, transported or otherwise disposed of during a particular month, Lessee shall pay royalties to Lessor on or before the end of the next succeeding month. Royalty payments shall be accompanied by a verified statement, in a form approved by Lessor, stating the amount of coal sold or otherwise disposed of, the gross proceeds accruing to Lessee, the calculation of allowable deductions, and any other information reasonably required by Lessor to verify production and disposition of the coal or coal products. In the event that Lessee uses or disposes of coal pursuant to a non-arm's-length contract, or uses coal for generation of electricity or for gasification, liquefaction, in situ processing, or other method of extracting energy from such coal, Lessee shall notify Lessor of such use or disposal on or before the end of the next succeeding month following such use or

disposal, and shall pay royalties upon Lessee's good faith estimate of the value of such coal, subject to Lessor's right to determine the value of such coal pursuant to paragraph 6.1, Production Royalties. On or before the royalty due date each month Lessee shall also submit to Lessor a detailed mining report of such production telling and mapping the coal tonnages extracted from the mine, whether sold or stockpiled, and the exact locations within the mine from which such tonnages were extracted. Production tonnages shall be determined by volumetric measurements within the mine and shall be verified by belt-scale weighing of the production coming out of the mine.

6.5 Suspension, Waiver or Reduction of Rents or Royalties. Lessor, to the extent not prohibited by applicable law, is authorized to waive, suspend, or reduce the rental or minimum royalty, or reduce the royalty applicable with respect to the entire Lease, whenever in Lessor's sole judgment it is necessary to do so in order to promote development, or whenever in the Lessor's sole judgment the Lease cannot be successfully operated under the terms provided herein.

7. RECORDKEEPING; INSPECTION; AUDITS.

7.1 Registered Agent; Records. Lessee shall maintain a registered agent within the State of Utah to whom any and all notices may be sent by Lessor and upon whom process may be served. Lessee shall also maintain an office within the State of Utah containing originals or copies of all maps, engineering data, permitting materials, books, records or contracts (whether such documents are in paper or electronic form) generated by Lessee that pertain in any way to coal production, output and valuation; mine operations; coal sales and dispositions; transportation costs; and calculation of royalties from the Leased Premises. Lessee shall maintain such documents for at least seven years after the date of the coal production to which the documents pertain.

7.2 Inspection. Lessor's employees and authorized agents at Lessor's sole risk and expense shall have the right to enter the Leased Premises to check scales as to their accuracy, and to go on any part of the Leased Premises to examine, inspect, survey and take measurements for the purposes of verifying production amounts and proper lease operations. Upon reasonable notice to Lessee, Lessor's employees and authorized agents shall further have the right to audit, examine and copy (at Lessor's expense) all documents described in paragraph 7.1, Registered Agent; Records, whether such documents are located at the mine site or elsewhere. Lessee shall furnish all conveniences necessary for said inspection, survey, or examination; provided, however, that such inspections shall be conducted in a manner that is in conformance with all applicable mine safety regulations and does not unreasonably interfere with Lessee's operations.

7.3 Geologic Information. In the event Lessee conducts core-drilling operations or other geologic evaluation of the Leased Premises, Lessor may inspect core

samples, evaluations thereof, and proprietary geologic information concerning the Leased Premises. Upon receiving written request from Lessor, Lessee shall provide Lessor with a copy of drill logs, geotechnical analysis, and geological reports pertaining to the Leased Premises.

7.4 Confidentiality. Any and all documents and geologic data obtained by Lessor through the exercise of its rights as set forth in paragraphs 7.2, Inspection., and 7.3, Geologic Information., may be declared confidential information by Lessee, in which event Lessor and its authorized agents shall maintain such documents and geologic data as protected records under the Utah Governmental Records Access Management Act or other applicable privacy statute and shall not disclose the same to any third party without the written consent of Lessee, the order of a court of competent jurisdiction requiring such disclosure, or upon termination of this Lease.

8. USE OF SURFACE ESTATE.

8.1 Lessor-Owned Surface. If Lessor owns the surface estate of all or some portion of the Leased Premises, by issuance of this Lease the Lessee has been granted the right to make use of such lands to the extent reasonably necessary and expedient for the economic operation of the leasehold. Lessee's right to surface use of Lessor-owned surface estate shall include the right to subside the surface. Such surface uses shall be exercised subject to the rights reserved to Lessor as provided in paragraph 2, RESERVATIONS TO LESSOR, and without unreasonable interference with the rights of any prior or subsequent lessee of Lessor.

8.2 Split-Estate Lands. If Lessor does not own the surface estate of any portion of the Leased Premises, Lessee's access to and use of the surface of such lands shall be determined by applicable law governing mineral development on split-estate lands, including without limitation applicable statutes governing access by mineral owners to split estate lands, and reclamation and bonding requirements. Lessee shall indemnify, defend and hold Lessor harmless for all claims, causes of action, damages, costs and expenses (including attorney's fees and costs) arising out of or related to damage caused by Lessee's operations to surface lands or improvements owned by third parties.

9. APPLICABLE LAWS AND REGULATIONS; HAZARDOUS SUBSTANCES.

9.1 State of Utah and Trust Lands Statute and Regulations. This Lease is issued pursuant to Title 53C, Utah Code Annotated, 1953, as amended, and Lessee is subject to and shall comply with all current and future rules and regulations adopted by the School and Institutional Trust Lands Administration and its successor agencies.

9.2 Other Applicable Laws and Regulations. Lessee shall comply with all applicable federal, state and local statutes, regulations, and ordinances, including without limitation the Utah Coal Mining and Reclamation Act, applicable statutes and regulations relating to mine safety and health, and applicable statutes, regulations and ordinances relating to public health, pollution control, management of hazardous substances and environmental protection.

9.3 Hazardous Substances. Lessee or other occupant pursuant to any agreement authorizing mining] shall not keep on or about the premises any hazardous substances, as defined under 42 U.S.C. Section 9601(14) or any other Federal environmental law, any regulated substance contained in or released from any underground storage tank, as defined by the Resource Conservation and Recovery Act, 42 U.S.C. Section 6991, *et seq,* or any substances defined and regulated as "hazardous" by applicable State law, (hereinafter, for the purposes of this Lease, collectively referred to as "Hazardous Substances") unless such substances are reasonably necessary in Lessee's mining operations, and the use of such substances or tanks is noted and approved in the Lessee's mining plan, and unless Lessee fully complies with all Federal, State and local laws, regulations, statutes, and ordinances, now in existence or as subsequently enacted or amended, governing Hazardous Substances. Lessee shall immediately notify Lessor, and any other Federal, State and local agency with jurisdiction over the Leased Premises, or surface thereof, or contamination thereon, of (i) all reportable spills or releases of any Hazardous Substance affecting the Leased Premises, (ii) all failures to comply with any applicable Federal, state or local law, regulation or ordinance governing Hazardous Substances, as now enacted or as subsequently enacted or amended, (iii) all inspections of the Leased Premises by, or any correspondence, order, citations, or notifications from any regulatory entity concerning Hazardous Substances affecting the Leased Premises, (iv) all regulatory orders or fines or all response or interim cleanup actions taken by or proposed to be taken by any government entity or private Party concerning the Leased Premises.

9.4 Hazardous Substances Indemnity. Lessee or other occupant pursuant to any agreement authorizing mining shall indemnify, defend, and hold harmless Lessor, its agencies, employees, officers, and agents with respect to any and all damages, costs, liabilities, fees (including attorneys' fees and costs), penalties (civil and criminal), and cleanup costs arising out of or in any way related to Lessee's use, disposal, transportation, generation, sale or location upon or affecting the Leased Premises of Hazardous Substances, as defined in paragraph 9.3 of this Lease. This indemnity shall extend to the actions of Lessee's employees, agents assigns, sublessees, contractors, subcontractors, licensees and invitees. Lessee shall further indemnify, defend and hold harmless Lessor and the United States from any and all damages, costs, liabilities, fees (including attorneys' fees and costs), penalties (civil and criminal), and cleanup costs arising out of or in any way

related to any breach of the provisions of this Lease concerning Hazardous Substances. This indemnity is in addition to, and in no way limits, the general indemnity contained in paragraph 16.1 of this Lease.

9.5 Waste Certification. The Lessee shall provide upon abandonment, transfer of operation, assignment of rights, sealing-off of a mined area, and prior to lease relinquishment, certification to the Lessor that, based upon a complete search of all the operator's records for the Lease, and upon its knowledge of past operations, there have been no reportable quantities of hazardous substances as defined in 40 Code of Federal Regulations Section 302.4, or used oil as defined in Utah Administrative Code R315-15, discharged (as defined at 33 U.S.C. Section 1321(a)(2)), deposited or released within the Leased Premises, either on the surface or underground, and that all remedial actions necessary have been taken to protect human health and the environment with respect to such substances. Lessee shall additionally provide to Lessor a complete list of all hazardous substances, hazardous materials, and their respective Chemical Abstracts Service Registry Numbers, and oil and petroleum products used or stored on, or delivered to, the Leased Premises. Such disclosure will be in addition to any other disclosure required by law or agreement.

10. BONDING.

10.1 Lease Bond Required. At any time after this Lease is executed, if requested by the Lessor, Lessee shall execute and file with the Lessor a good and sufficient bond or other financial guarantee acceptable to Lessor in order to: (a) guarantee Lessee's performance of all covenants and obligations under this Lease, including Lessee's obligation to pay royalties; and (b) ensure compensation for damage, if any, to the surface estate and any surface improvements. The form of the Lease Bond shall be as prescribed or approved as to form by Lessor. Lessee shall also satisfy all reclamation bonding requirements of the Utah Division of Oil, Gas and Mining ("UDOGM") in connection with the issuance of a mine permit which includes the Leased Premises.

10.2 Reclamation Bonding. The bond filed with the Utah Division of Oil, Gas and Mining ("UDOGM") in connection with the issuance of a mine permit which includes the Leased Premises shall be deemed to satisfy Lessor's bonding requirements with respect to Lessee's reclamation obligations under this Lease; provided, however, upon notice to Lessee and a public hearing with respect to the basis for its decision, the Lessor may, in its reasonable discretion, determine that the bond filed with UDOGM is insufficient to protect Lessor's interests. In such an event the Lessor shall enter written findings as to the basis for its calculation of the perceived insufficiency and enter an order establishing the amount of additional bonding required. Lessee shall file any required additional bond with Lessor within thirty (30) days after demand by Lessor. Lessor may increase or

decrease the amount of any additional bond from time to time in accordance with the same procedure.

10.3 Release of Additional Bond. Any additional bond required by Lessor pursuant to 10.2, Reclamation Bonding, may be released by Lessor at any time and shall be released no later than the time of final bond release by UDOGM with respect to the Leased Premises.

11. WATER RIGHTS.

11.1 Water Rights in Name of Lessor. If Lessee files to appropriate water for coal mining operations on the Leased Premises, the filing for such water right shall be made by Lessee in the name of Lessor at no cost to Lessor, and such water right shall become an appurtenance to the Leased Premises, subject to Lessee's right to use such water right at no cost during the term of this Lease.

11.2 Option to Purchase. If Lessee purchases or acquires an existing water right for coal mining operations on the Leased Premises, Lessor shall have the option to acquire that portion of such water right as was used on the Leased Premises upon expiration or termination of this Lease. The option price for such water right shall be the fair market value of the water right as of the date of expiration or termination of this Lease. Upon expiration or termination of this Lease, Lessee shall notify Lessor in writing of all water rights purchased or acquired by Lessee for coal mining operations on the Leased Premises and its estimate of the fair market value of such water right. Lessor shall then have forty-five (45) days to exercise its option to acquire the water by payment to Lessee of the estimated fair market value. If Lessor disagrees with Lessee's estimate of fair market value, Lessor shall notify Lessee of its disagreement within the 45 day option exercise period. The fair market value of the water right shall then be appraised by a single appraiser mutually acceptable to both parties, which appraisal shall be final and not subject to review or appeal. If the parties cannot agree upon the choice of an appraiser, the fair market value of the water right shall be determined by a court of competent jurisdiction. Conveyance of any water right pursuant to this paragraph shall be by quit claim deed.

12. ASSIGNMENT OR SUBLEASE; OVERRIDING ROYALTIES.

12.1 Consent Required. Lessee shall not assign or sublease this Lease in whole or in part, or otherwise assign or convey any rights or privileges granted by this Lease, including, without limitation, creation of overriding royalties or production payments, without the prior written consent of Lessor. Any assignment, sublease or other conveyance made without prior written consent of Lessor shall have no legal effect unless and until approved in writing by Lessor. Exercise of any right with respect to the Leased Premises in violation of this provision shall constitute a default under this Lease.

12.2 Binding Effect. All of the terms and provisions of this Lease shall be binding upon and shall inure to the benefit of their respective successors, assigns, and sublessees.

12.3 Limitation on Overriding Royalties. Lessor reserves the right to disapprove the creation of an overriding royalty or production payment that would, in Lessor's reasonable discretion, constitute an unreasonable economic burden upon operation of the Lease. In exercising its discretion to disapprove the creation of an overriding royalty, Lessor shall consult with Lessee and any third parties involved and shall prepare findings to evidence the basis of its decision. Cumulative overriding royalties of 2% or less shall be deemed presumptively reasonable unless special circumstances are shown by Lessor to exist.

13. OPERATIONS.

13.1 Permitting. Before Lessee commences exploration, drilling, or mining operations on the Leased Premises, it shall have obtained such permits and posted such bonds as may be required under applicable provisions of the Utah Coal Mining and Reclamation Act, the Surface Mining Control and Reclamation Act, and associated regulations, together with applicable regulations of the surface management agency. Lessee shall maintain any required permits in place for the duration of mining operations and reclamation. Upon request, Lessee shall provide Lessor with a copy of all regulatory filings relating to permitting matters.

13.2 Plan of Operations. Prior to the commencement of any underground mining operations on the Leased Premises, Lessee shall obtain Lessor's approval of a plan of operations for the Leased Premises. The plan of operations shall contain all information required to be contained in a federal Resource Recovery and Protection Plan, as described in 43 Code of Federal Regulations Section 3482.1(b) and (c) (1998). Lessor may modify the proposed plan of operations as is needed to insure that there is no waste of economically recoverable coal reserves contained on the Leased Premises. In this context "waste" shall mean the inefficient utilization of, or the excessive or improper loss of an otherwise economically recoverable coal resource. Lessor shall notify Lessee in writing of its approval or modifications of the plan of operations. The plan of operations submitted by Lessee shall be deemed approved by Lessor if Lessor has not otherwise notified Lessee within sixty (60) days of filing.

13.3 Plan of Operations - Modification. In the event that material changes are required to the plan of operations during the course of mining, Lessee shall submit a modification of the plan of operations to the Lessor. Routine adjustments to the plan of operations based upon geologic circumstances encountered during day-to-day mining operations do not require the submission of a modification. If the proposed changes require emergency action by Lessor, then the Lessee shall so notify the Lessor at the time of submission of the modification and the parties

shall use their best efforts to meet the Lessee's time schedule regarding implementation of the changes. Non-emergency modifications will be reviewed promptly by Lessor to insure that there is no waste of economically recoverable coal reserves pursuant to the plan of operations, as modified, and Lessor shall notify lessee in writing of its approval or modification of the proposed modification. Modifications shall be deemed approved by Lessor if Lessor has not otherwise notified Lessee within thirty (30) days of filing with Lessor.

13.4 Mine Maps. Lessee shall maintain at the mine office clear, accurate, and detailed maps of all actual and planned operations prepared and maintained in the manner prescribed by 43 Code of Federal Regulations Section 3482.3. Said maps shall be stamped and certified by a Professional Engineer or Professional Geologist with experience in coal mining. Lessee shall provide copies of such maps to Lessor upon request.

13.5 Good Mining Practices. Lessee shall conduct exploration and mining operations on the Leased Premises in accordance with standard industry operating practices, and shall avoid waste of economically recoverable coal. Lessee shall comply with all regulations and directives of the Mine Safety and Health Administration or successor agencies for the health and safety of employees and workers. Lessee shall further comply with the performance standards for underground resource recovery set forth at 43 Code of Federal Regulations Section 3484.1(c) (1998) if mining the coal underground; provided, however, that Lessor may waive such standards from time to time in its reasonable discretion, upon request by Lessee.

13.6 Mining Units. Lessor may approve the inclusion of the Leased Premises in a mining unit with federal, private or other non-state lands upon terms and conditions that it deems necessary to protect the interests of the Lessor, including without limitation segregation of production, accounting for commingled coal production, and minimum production requirements or minimum royalties for the Leased Premises.

14. EQUIPMENT; RESTORATION.

14.1 Equipment. Upon termination of this Lease, Lessee shall remove, and shall have the right to remove, all improvements, equipment, stockpiles, and dumps from the Leased Premises within six (6) months; provided, however, that Lessor may, at Lessor's sole risk and expense, and subject to Lessee's compliance with requirements imposed by UDOGM and MSHA, require Lessee to retain in place underground timbering supports, shaft linings, rails, and other installations reasonably necessary for future mining of the Leased Premises. All improvements and equipment remaining on the Leased Premises after six (6) months may be deemed forfeited to Lessor upon written notice of such forfeiture to Lessee. Lessee may abandon underground improvements, equipment of any type, stockpiles and dumps in place if such abandonment is in compliance with

applicable law, and further provided that Lessee provides Lessor with financial or other assurances sufficient in Lessor's reasonable discretion to protect Lessor from future environmental liability with respect to such abandonment or any associated hazardous waste spills or releases. Lessee shall identify and locate on the mine map the location of all equipment abandoned on the Lease Premises.

14.2 Restoration and Reclamation. Upon termination of this Lease, Lessee shall reclaim the Leased Premises in accordance with the requirements of applicable law, including mine permits and reclamation plans on file with UDOGM. Lessee shall further abate any hazardous condition on or associated with the Leased Premises. Lessee and representatives of all governmental agencies having jurisdiction shall have the right to re-enter the Leased Premises for reclamation purposes for a reasonable period after termination of the Lease.

15. DEFAULT.

15.1 Notice of Default; Termination. Upon Lessee's violation of or failure to comply with any of the terms, conditions or covenants set forth in this Lease, Lessor shall notify Lessee of such default by registered or certified mail, return receipt requested, at the last address for Lessee set forth in Lessor's files. Lessee shall then have thirty (30) days, or such longer period as may be granted in writing by Lessor, to either cure the default or request a hearing pursuant to the Lessor's administrative adjudication rules. In the event Lessee fails to cure the default or request a hearing within the specified time period, Lessor may cancel this Lease without further notice to or appeal by Lessee.

15.2 Effect of Termination. The termination of this Lease for any reason, whether through expiration, cancellation or relinquishment, shall not limit the rights of the Lessor to recover any royalties and/or damages for which Lessee may be liable, to recover on any bond on file, or to seek injunctive relief to enjoin continuing violations of the Lease terms. No remedy or election under this Lease shall be deemed exclusive, but shall, wherever possible, be cumulative with all other remedies available under this Lease, at law, or in equity. Lessee shall surrender the Leased Premises upon termination; however, the obligations of Lessee with respect to reclamation, indemnification and other continuing covenants imposed by this Lease shall survive the termination.

16. MISCELLANEOUS PROVISIONS.

16.1 Indemnity. Except as limited by paragraph 7.2, Inspection, Lessee shall indemnify and hold Lessor harmless for, from and against each and every claim, demand, liability, loss, cost, damage and expense, including, without limitation, attorneys' fees and court costs, arising in any way out of Lessee's occupation and use of the Leased Premises, including without limitation claims for death, personal injury, property damage, and unpaid wages and benefits. Lessee further

agrees to indemnify and hold Lessor harmless for, from and against all claims, demands, liabilities, damages and penalties arising out of any failure of Lessee to comply with any of Lessee's obligations under this Lease, including without limitation attorneys' fees and court costs. Lessee may be required to obtain insurance in a type and in an amount acceptable to Lessor, naming Lessor, its employees, its Board of trustees and the State of Utah as co-insured parties under the policy.

16.2 Interest. Except as set forth in paragraph 4, BONUS BID, interest shall accrue and be payable on all obligations arising under this Lease at such rate as may be set from time to time by rule enacted by Lessor, or the statutory contract rate, whichever is greater. Interest shall accrue and be payable, without necessity of demand, from the date each such obligation shall arise.

16.3 Suspension. In the event that Lessor in its reasonable discretion determines that suspension is necessary in the interests of conservation of the coal resource, or if Lessee has been prevented from performing any of its obligations or responsibilities under this Lease or from conducting mining operations by labor strikes, fires, floods, explosions, riots, any unusual mining casualties or conditions, Acts of God, government restrictions or orders, severe weather conditions, or other extraordinary events beyond its control, then the time for performance of this Lease by Lessee shall be suspended during the continuance of such acts which prevent performance, excepting any payments due and owing to Lessor.

16.4 Consent to Suit; Jurisdiction (i) Lessor and Lessee agree that all disputes arising out of this Lease shall be litigated only in the Third Judicial District Court for Salt Lake County, Utah; (ii) Lessee consents to the jurisdiction of such court; and (iii) Lessee shall not bring any action against Lessor without exhaustion of available administrative remedies and compliance with applicable requirements of the Utah Governmental Immunity Act.

16.5 No Waiver. No waiver of the breach of any provision of this Lease shall be construed as a waiver of any preceding or succeeding breach of the same or any other provision of this Lease, nor shall the acceptance of rentals or royalties by Lessor during any period of time in which Lessee is in default be deemed to be a waiver of such default.

16.6 Severability. The invalidity of any provision of this Lease, as determined by a court of competent jurisdiction, shall in no way affect the validity of any other provision hereof.

16.7 Entire Lease. This Lease, together with any attached stipulations, sets forth the entire agreement between Lessor and Lessee with respect to the subject matter of this Lease. No subsequent alteration or amendment to this Lease shall be binding upon Lessor and Lessee unless in writing and signed by each of them.

IN WITNESS WHEREOF, the parties have executed this Lease as of the date hereinabove first written.

THE STATE OF UTAH, acting by and through the SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION ("LESSOR")

DAVID URE, DIRECTOR

By:_____
THOMAS B. FADDIES
ASSISTANT DIRECTOR/MINERALS
School & Institutional Trust Lands Administration – LESSOR

APPROVED AS TO FORM:

SEAN D. REYES
ATTORNEY GENERAL

By:_____
Special Assistant Attorney General

Form Approved: 8/16/18

LESSEE:

By:_____

Its:_____

IN WITNESS WHEREOF, the parties have executed this Lease as of the date hereinabove first written.

THE STATE OF UTAH, acting by and through the SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION ("LESSOR")

DAVID URE, DIRECTOR

By: _____
THOMAS B. FADDIES
ASSISTANT DIRECTOR/MINERALS
School & Institutional Trust Lands
Administration – LESSOR

APPROVED AS TO FORM:

SEAN D. REYES
ATTORNEY GENERAL

By: _____
Special Assistant Attorney General

Form Approved: 8/16/18

LESSEE: Utah American Energy, Inc.

By: Matthew C Eyre

Its: President / GM

STATE OF UTAH)
:
COUNTY OF SALT LAKE)

On the 1st day of October, 2018, personally appeared before me THOMAS B. FADDIES, the ASSISTANT DIRECTOR of Minerals of the School and Institutional Trust Lands Administration of the State of Utah (SITLA), who, his identity and position having been satisfactorily established to me, affirmed to me upon oath that the governing body of SITLA, has authorized him to execute the foregoing instrument, and did duly acknowledge in my presence having executed the same for the purpose stated therein.

Given under my hand and seal this 1st day of October, 2018.

My commission expires: 6/18/19

Aly Gold
Notary Public

ALY GOLD
Notary Public State of Utah
My Comm. Exp: June 18, 2019
Comm. Number: 683697

STATE OF Utah)
:
COUNTY OF Carbon)

On the 31st day of August, 2018, personally appeared before me Matthew Efaw, signer(s) of the above instrument, personally known to me, or whose identity has been satisfactorily established to me, who did duly acknowledge to me that (he) (she) (they) voluntarily executed the foregoing instrument for the purpose stated therein.

Given under my hand and seal this 31st day of August, 2018.

My commission expires: March 27, 2021

Linda Kerns
Notary Public

LINDA KERNS
NOTARY PUBLIC
STATE OF UTAH
COMMISSION # 693708
COMM.EXP.03-27-2021

STATE OF)
:
COUNTY OF)

On the _____day of _____, 20____, personally appeared before me (name) _____ the (title) _____of (entity)_____and vesting, who, his/her identity and position having been satisfactorily established to me, affirmed to me upon oath that the governing body of said entity, has authorized him/her to execute the foregoing instrument, and did duly acknowledge in my presence having executed the same for the purpose stated therein.

Given under my hand and seal this_____day of_____, 20 .

My commission expires:

_____
Notary Public

4813-1816-8420

APPENDIX 3-1a

Vegetation Mapping
Williams Draw

Vegetation Mapping
Williams Draw
Lila Canyon Mine, Utah

2021



View from the Williams Draw Study Area

Prepared by

MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
Post Office Box 337
Springville, Utah 84663
(801) 489-6937

by

Patrick Collins, Ph.D.

for

LILA CANYON
23415 North Lila Canyon Road
East Carbon, Utah 84520

December 2021

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VEGETATION MAP . . . . . (attached)

INTRODUCTION

Vegetation mapping was conducted onsite for the Lila Canyon Mine in Emery County, Utah. The purpose of the mapping was to update the mine's current vegetation map to include the plant communities in areas proposed for mine expansion as well as areas of potential future lease areas.

The Williams Draw study area is in part, an expansion to the current Lila Canyon Mine permit area, but it also includes areas of projected future coal leases. The study area is located in the Book Cliffs mountain range of Utah, sometimes referred to as the western cliffs of that range. The Book Cliffs consist of Cretaceous and Tertiary geologic formations and is part of the Colorado Plateau, and is located east of the Basin & Range Province and adjacent to the Rocky Mountain system. Most of the Williams Draw study area was between 6,000 ft and 7,000 ft above sea level.

METHODS

Aerial imagery was first provided to Mt. Nebo Scientific that delineated the boundary of the Williams Draw study area. The current vegetation map for the Lila Canyon Mine was also provided. Other maps were then created by Mt. Nebo Scientific to be used in the field for the new vegetation mapping project. These maps included:

- Topographic maps,
- Color aerial imagery,
- Color infrared (CIR) imagery,
- Access maps with GPS coordinates.

Other tools and equipment used in the field included:

- Field assistant,
- UTV side-by-side,
- Spotting scope,
- Binoculars,

- Cameras,
- Air drone with camera.

The project was initiated in the office where mapping programs, existing vegetation maps, CIR, topographic maps and color aerial imagery were used to create field maps with GPS waypoints for potential access areas (roads and drainages) and boundary lines. The UTV enabled field workers to dissect the study area to its southern-most boundary on existing two-track roads. Drainage channels were also used for access to the east and west of the existing access roads. In areas where access was more limited, the air drone with a camera was employed along with a high-powered spotting scope and binoculars. Plant communities were delineated in the field using all the aforementioned maps.

RESULTS

Following the field work the maps were taken to the office and imported to a mapping program where the plant communities were delineated electronically to provide the mine operator with a DRAFT map that can be merged with the current permit area vegetation map. This process will provide an updated version of the Lila Canyon Mine's vegetation map including the **current** permit area and those areas **proposed** for a mine expansion as well as **potential** future lease areas.

The new DRAFT map has been attached to this report. If this report is submitted to the regulatory agencies, it should be replaced with the FINAL new (merged) vegetation map *that was finalized by Lila Canyon Mine's Engineering Department*.

Lila Canyon Lease Expansion Project Biological Survey Report

MAY 2022

PREPARED FOR

Emery County Coal Resources, Inc.

PREPARED BY

SWCA Environmental Consultants

LILA CANYON LEASE EXPANSION PROJECT
BIOLOGICAL SURVEY REPORT

Prepared for

Emery County Coal Resources, Inc.
P.O. Box 910
East Carbon, Utah 84520

Prepared by

SWCA Environmental Consultants
257 East 200 South, Suite 200
Salt Lake City, Utah 84111
www.swca.com

SWCA Project No. 72142

May 2022

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1 INTRODUCTION

Emery County Coal Resources, Inc., is working to incorporate lease modifications into the Utah Division of Oil, Gas and Mining (UDOGM) permit for the Lila Canyon coal mine located in Emery County, Utah (DOGM Permit # C0070013). The lease modification areas are located approximately 30 miles southeast of Price, Utah, in Township 16 South, Range 15 East. The lease modifications will incorporate 678.87 acres of additional area (project area) on land administered by the Bureau of Land Management (BLM) Price Field Office and the Utah School and Institutional Trust Lands Administration.

1.1 Project Location

The Lila mine is located in the foothills of the Book Cliffs mountains approximately 35 miles southeast of Price, Utah, in an area that is also referred to as the Book Cliffs coal field. Emery County Coal Resources, Inc. is planning to expand mining activities to the east of existing mine areas. The lease expansion area is set within the steep canyons and cliffs south of Horse Canyon and on the opposing slope of Range Creek opposite of Nelson Canyon (Appendix A, Figure A-1).

1.2 Project Area Description

The lease expansion area sits within the canyons and cliffs of the Book Cliffs east of Highway 6. The five primary canyons within the project area generally follow an east-west orientation. The eastern edge of the project area is located near the ridge that separates the Book Cliffs from Range Creek. Elevations within the project area range from approximately 7,000 to 8,100 feet above mean sea level. The north-facing walls of the canyons are densely forested, and the south-facing slopes have large areas of exposed rock. Vegetation communities within the project area include pinyon-juniper habitat interspersed with sage and other upland shrubs within the lower elevations and changes to fir-dominated forests at higher elevations. Dominant plant species within the area include Douglas-fir (*Pseudotsuga menziesii*), pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), big sagebrush (*Artemisia tridentata*), and rubber rabbitbrush (*Ericameria nauseosa*) (Appendix B).

Soils within the project area are a mix of silty loam and clay loam derived from sediments eroded from the adjacent Book Cliffs. Observations from the field surveys indicate that cryptobiotic crusts are present throughout the Utah juniper stands.

2 METHODS

2.1 Agency Consultation

SWCA Environmental Consultants (SWCA) contacted UDOGM, BLM Price Field Office, U.S. Fish and Wildlife Service (USFWS) Utah Field Office, and Utah Division of Wildlife Resources (UDWR) in preparation for the desktop analysis and site surveys for the project. Agency personnel, including wildlife biologists and botanists, were consulted for project-specific sensitive species and analysis requirements.

2.2 Desktop Analysis Methods

SWCA used information from several database systems and agency personnel to compile a list of federal and state listed species for the project.

2.2.1 U.S. Fish and Wildlife Listed Species

The USFWS Information for Planning and Consultation (IPaC) database was used to procure a list of federally listed threatened, endangered, and candidate species, as well as birds of conservation concern that may occur or have critical habitat within the project area (Appendix C). Table 1 lists the species identified by the USFWS IPaC.

2.2.2 Bureau of Land Management Sensitive Species

Both the BLM Price Field Office wildlife biologist and botanist were consulted to help identify sensitive species that may occur within the project area. They used habitat spatial modeling and known species occurrences to determine the final list of sensitive species with the potential to occur (Appendix D).

2.2.3 Utah State-Listed Species

The Utah Natural Heritage Program (UNHP) maintains a list of Species of Greatest Conservation Need throughout the state of Utah. Data from the online mapping program were used to determine which state-listed species have the potential to occur within the project area. SWCA reviewed the list with biologists from the UDWR Price District Office (Table 2) and consulted with the biologists regarding the potential presence of and possible survey requirements for bats. Given the relatively low volume of surface disturbance for the project, it was determined that bats would likely not be adversely affected, and surveys would not be required (see Appendix D).

2.3 Field Survey Methods

Results from the desktop analysis were used to inform suitable habitat surveys in the field. Two SWCA biologists conducted suitable habitat surveys on March 8 and April 28, 2022, to confirm the presence or absence of habitat for each sensitive species. Due to the steep terrain within the project area, biologists traversed up from the bottom of each of the five primary canyons to assess the area for habitat suitability. They utilized binoculars to determine if habitats within the project area were suitable for any of the listed sensitive species. The entire project area and the associated species buffers were surveyed; these areas are collectively referred to as the survey area. Observations and data were recorded on tablets with Esri ArcGIS capabilities.

3 RESULTS

3.1 Desktop Analysis Results

3.1.1 U.S. Fish and Wildlife Listed Species

The IPaC analysis identified nine listed threatened, endangered, or candidate species with potential to occur within the project area. Additionally, one bird of conservation concern (BCC) was also identified. A summary of the IPaC results is provided in Table 1.

Table 1. IPaC Species List

Category	Common Name	Scientific Name	Status	Field Survey Required?	Habitat Description
Birds	Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Yes	Rocky canyons. Nesting habitat in caves or cliff ledges in steep-walled canyons.
	Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	No*	Riparian habitat does not exist within the project area.
	Black rosy-finch	*Leucosticte atrata*	Bird of Conservation Concern	No*	Breeding habitat in areas above treeline with cliffs and rockslides.
Fish	Bonytail chub	*Gila elegans*	Endangered	No*	Colorado River and perennial tributaries.
	Colorado pikeminnow	*Ptychocheilus lucius*	Endangered	No*	Colorado River and perennial tributaries.
	Humpback chub	*Gila cypha*	Threatened	No*	Colorado River and perennial tributaries.
	Razorback sucker	*Xyrauchen texanus*	Endangered	No*	Colorado River and perennial tributaries.
Insects	Monarch butterfly	*Danaus plexippus*	Candidate	Yes	Milkweed stands within prairies, meadows, grasslands, and roadsides.
Flowering plants	Jones cycladenia	*Cycladenia humilis* var. *jonesii*	Threatened	Yes	Mixed desert scrub habitats within gypsiferous, saline soils of the Cutler, Summerville, and Chinle Formations.
	Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	Yes	Wet, riparian habitat, most often associated with perennial streams.

Source: USFWS (2022a).

*Surveys for these species were not required due to lack of habitat within project area.

Field surveys were determined to be unnecessary for species that lacked suitable habitat within the project area based on SWCA's desktop analysis, habitat evaluation, and agency consultation.

Modeling data for Mexican spotted owl habitat was used to determine that the project area contained potentially suitable habitat for breeding. Habitat suitability surveys followed the *Mexican Spotted Owl Survey Protocol. U.S. Fish and Wildlife Service* (USFWS 2022b).

3.1.2 Bureau of Land Management Sensitive Species

One BLM sensitive plant species, Horse Canyon stickleaf (*Mentzelia multicaulis* var. *librina*), was identified with potential to occur within the project area (see Appendix D).

A known population of Horse Canyon stickleaf exists approximately 5 miles north of the project area. Suitable habitat for the species includes sagebrush, rabbitbrush, and pinyon-juniper communities at elevations of about 6,200 feet on the Mancos Shale and Price River Formations (Utah Native Plant Society 2020).

3.1.3 Utah State-Listed Species

The UNHP database identified six Species of Greatest Conservation Need with potential to occur within the project area. A summary of the Species of Greatest Conservation Need is provided in Table 2.

Table 2. Utah Natural Heritage Program Species of Greatest Conservation Need List

Category	Common Name	Scientific Name	Field Survey Required?	Habitat Description
Birds	Peregrine falcon	*Falco peregrinus*	No*	Cliffs and tall, human-made structures surrounded by open or partially wooded landscapes with access to nearby riparian habitat.
	Golden eagle	*Aquila chrysaetos*	No*	Open shrub and grassland communities; often associated with prairie dog colonies.
	Burrowing owl	*Athene cunicularia*	No*	Open shrub and grassland communities; can also be found in vacant lots, pastures, and other similar areas of disturbance.
	Ferruginous hawk	*Buteo regalis*	No*	Lower-elevation grassland, shrubsteppe, and desert habitats. Winter habitat is often associated with prairie dog colonies.
Mammals	Townsend's big-eared bat	*Corynorhinus townsendii*	No†	Cavern-like structures including mines, buildings, and rock crevices located within sagebrush, desert scrub, pinyon-juniper woodland, and ponderosa pine communities.
	White-tailed prairie dog	*Cynomys leucurus*	Yes	Arid to semi-arid grassland and shrub communities between 4,200 and 7,500 feet in elevation.

*Surveys for these species were not required as Lila mine conducts raptor surveys for the general mine area.

† Surveys for these species were not required based on consultation with the UDWR (see Appendix D).

Sources: USFWS (2022); UDWR (2021).

3.2 Field Survey Results

No suitable habitat was identified during the field survey for state or federally listed threatened, endangered, or sensitive species. Details of the survey results are provided in Table 3.

Habitat within the survey area consists of steep, heavily vegetated canyons dominated by pinyon-juniper and Douglas-fir forests. South-facing walls within the canyon contain large areas of exposed bedrock; however, this rock receives long periods of direct sunlight that would generally prohibit use of the area as habitat by sensitive species, including Mexican spotted owl. The canyons lack the steep slot-canyon habitat required by Mexican spotted owl in its northern ranges.

Incidental observations of wildlife and wildlife signs were recorded for mule deer (*Odocoileus hemionus*) (tracks), coyote (*Canis latrans*) (tracks), cottontail rabbit (*Sylvilagus audubonii*) (tracks), and common raven (*Corvus corax*).

Table 3. Suitable Habitat Survey Results

Category	Common Name	Scientific Name	Listing Status	Survey Buffer	Suitable Habitat Present?	Reason
Birds	Mexican spotted owl	*Strix occidentalis lucida*	USFWS threatened	0.5 mile	No	Canyons with features consistent with Mexican spotted owl suitable habitat parameters were not present within the survey area. Limited exposed rock was sunbaked. No slot canyons present.
Insects	Monarch butterfly	*Danaus plexippus*	USFWS candidate	N/A	No	Milkweed stands were not present within survey area.
Flowering plants	Jones cycladenia	*Cycladenia humilis* var. *jonesii*	USFWS threatened	300 feet	No	Soil types and habitats consistent with known species habitat parameters were not present within the survey area.
	Ute ladies'-tresses	*Spiranthes diluvialis*	USFWS threatened	300 feet	No	Aquatic and riparian habitat was not present within the survey area.
	Horse Canyon stickleaf	*Mentzelia multicaulis* var. *librina*	BLM sensitive	300 feet	No	Soil types and elevation gradient consistent with habitat parameters were not present within survey area.
Mammals	White-tailed prairie dog	*Cynomys leucurus*	UNHP SGCN*	0.25 mile	No	No prairie dog burrows were observed within the survey area.

* Species of Greatest Conservation Need

Sources: USFWS (2022a); UDWR (2021)

4 SUMMARY

A desktop analysis and consultation with BLM and UDWR biologists were conducted by SWCA to determine if federally and state-listed species had the potential to occur within the survey area of the Lila mine project. Field surveys were conducted for Jones cycladenia, Ute ladies'-tresses, monarch butterfly, Mexican spotted owl, and white-tailed prairie dog. Habitats within the survey area generally consist of steep canyons with north-facing slopes covered in Douglas-fir and pinyon-juniper forests and south-facing slopes showing large areas of exposed rock interspersed with mixed forest habitat. SWCA confirmed that no suitable habitat exists for the list of potential species within the survey area. Figures depicting the project location and survey area are located in Appendix A. Photographs of the survey area are located in Appendix B.

5 LITERATURE CITED

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———. 2022b. Mexican Spotted Owl Survey Protocol. U.S. Fish and Wildlife Service, 2012 (Updated 3/15/2022). Available at: https://www.fws.gov/sites/default/files/documents/APPENDIX%20D%20-%20Mexican%20spotted%20owl%20Survey%20Protocol%20508%20March%202022_Final.pdf. Accessed on March 4, 2022.

Utah Division of Wildlife Resources (UDWR). 2021. Utah Species of Greatest Conservation Need. Updated April 11, 2022. Available at: https://utahdnr.maps.arcgis.com/home/item.html?id=2d3b77d2b46e42509605c05b81fd3a00. Accessed March 4, 2022.

Utah Native Plant Society. 2020. Utah Rare Plant Guide. *Utah globally and state rare vascular plant lists and guide references.* Available at: https://www.utahrareplants.org/rpg_species.html. Accessed March 4, 2022.

APPENDIX A

Maps

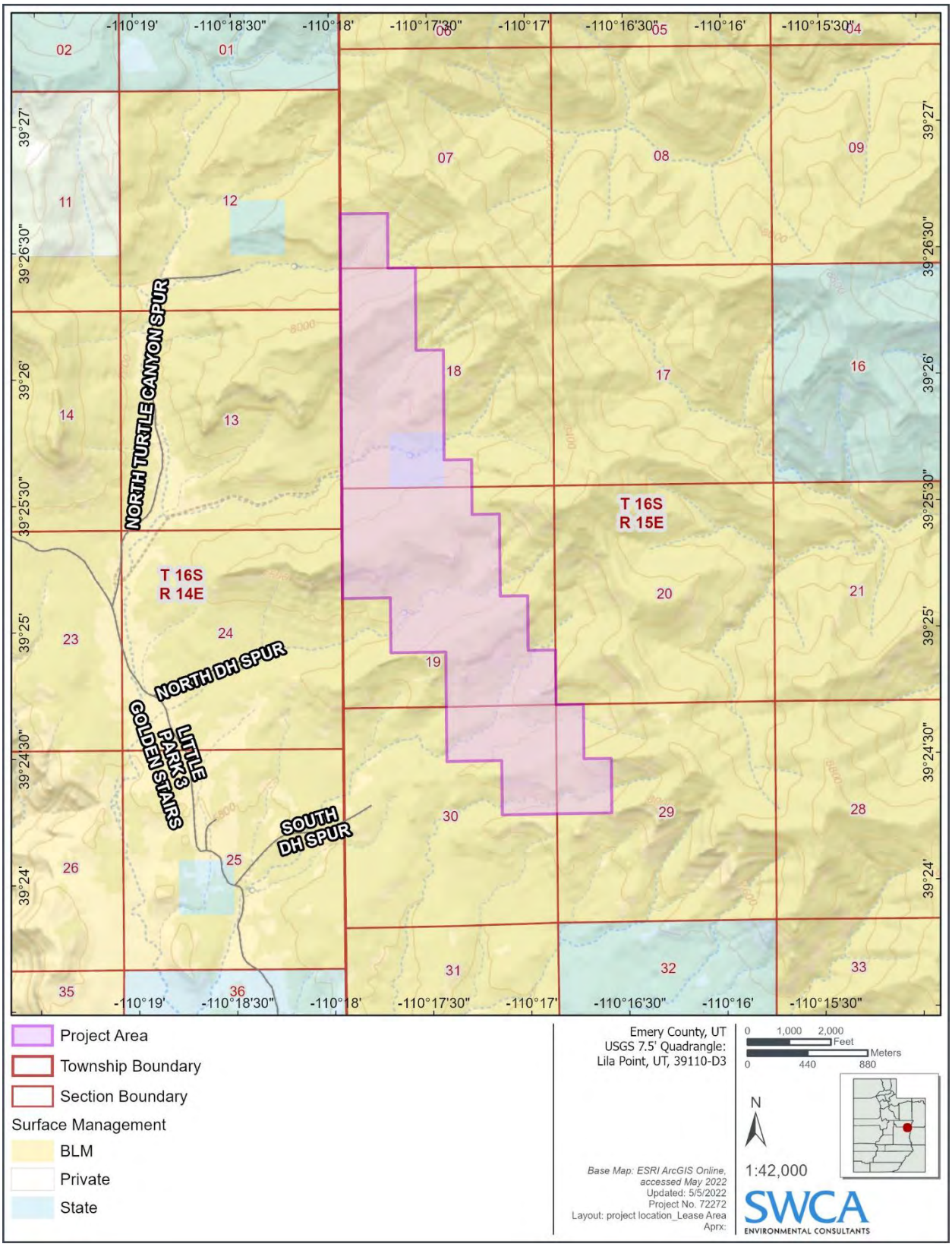


Figure A-1. Project location.

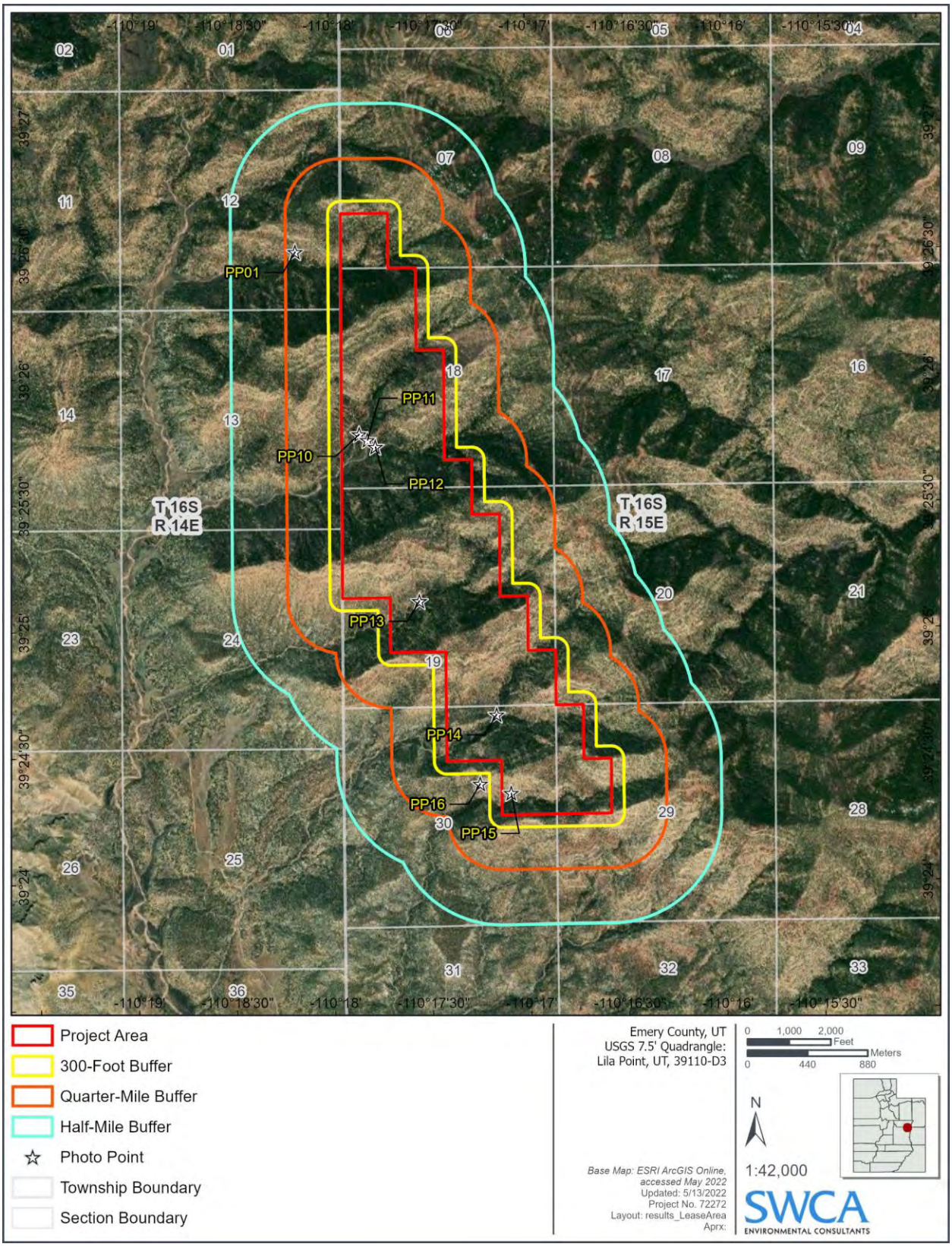


Figure A-2. Survey results.

APPENDIX B

Photographs



Figure B-1. PP01, northern-most canyon within project area.



Figure B-2. PP01, northern-most canyon within project area.



Figure B-3. PP10, canyon habitat within project area.



Figure B-4. PP11, canyon habitat within project area.



Figure B-5. PP12, canyon habitat within project area.



Figure B-6. PP13, canyon habitat within project area, view showing exposed rock on south-facing slope.



Figure B-7. PP14, canyon habitat within project area, view showing exposed rock on south-facing slope.



Figure B-8. PP15, canyon habitat within project area, view showing exposed rock on south-facing slope and dense forest on north-facing slope.



Figure B-9. PP16, canyon habitat within project area, view showing exposed rock on south-facing slope and dense forest on north-facing slope.

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APPENDIX C

U.S. Fish and Wildlife Service
Information for Planning and Consultation Resource List

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Emery County, Utah



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Local office

Utah Ecological Services Field Office

(801) 975-3330
(801) 975-3331

2369 West Orton Circle, Suite 50
West Valley City, UT 84119-7603

http://www.fws.gov
http://www.fws.gov/utahfieldoffice/

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* Wherever found There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/8196	Threatened
Southwestern Willow Flycatcher *Empidonax traillii extimus* Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6749	Endangered

Fishes

NAME	STATUS
Bonytail *Gila elegans* Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1377	Endangered

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Colorado Pikeminnow (=squawfish) Ptychocheilus lucius — Endangered

This species only needs to be considered if the following condition applies:

- The project depletes water from the Colorado River basin or its tributaries.

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/3531

Humpback Chub Gila cypha — Threatened

Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/3930

Razorback Sucker Xyrauchen texanus — Endangered

Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/530

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS

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Jones Cycladenia Cycladenia humilis var. jonesii — Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3336

Ute Ladies'-tresses Spiranthes diluvialis — Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2159

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Mexican Spotted Owl Strix occidentalis lucida https://ecos.fws.gov/ecp/species/8196#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

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Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

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Black Rosy-finch Leucosticte atrata — Breeds Jun 15 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9460

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

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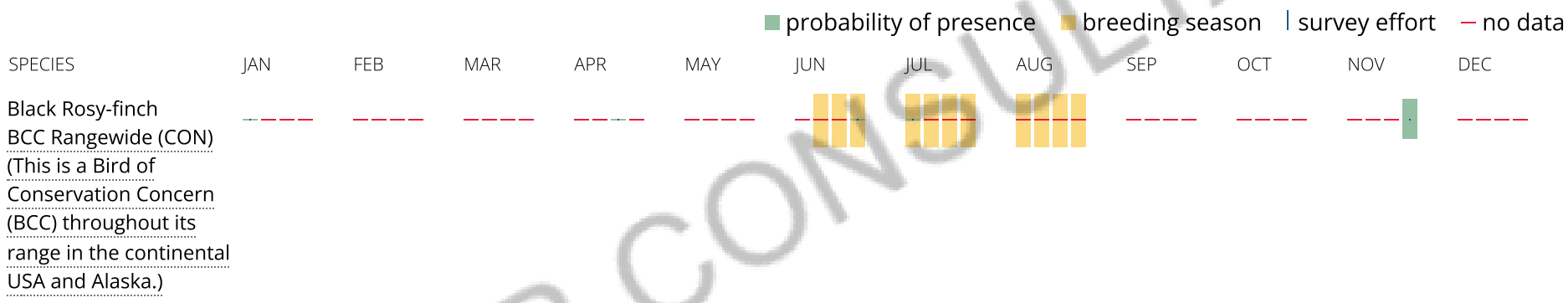
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

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What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

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3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and

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helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

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This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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APPENDIX D

Agency Correspondence Emails

From: Burnham, Dashell A
To: Chad Incorvia
Subject: Re: [EXTERNAL] Lila Canyon Mine
Date: Tuesday, February 15, 2022 9:52:19 AM
Attachments: image001.png

EXTERNAL: This email originated from outside SWCA. Please use caution when replying.

Chad,

Thank you for sending the information over. After reviewing my files, there are BLM sensitive Horse Canyon stick leaf occupied habitats to the north about 5 miles. They occur in a completely different soil type and elevation gradient, so I am doubtful that there would be suitable habitat in the proposed expansion area. That was the only other species I though you might run into. If you could include it in the bio write up though, to show that it was looked at, but no suitable habitat determined that would work. Otherwise, plan on doing the habitat assessments for the ULT's and Cycladenia that we discussed yesterday.

Let me know if you have any other questions on this.

Thanks!

DaShell Burnham
Botanist
Bureau of Land Management
Green River District, Price Field Office
Phone: 435-636-3645

"Don't judge each day by the harvest you reap but by the seeds that you plant"
- Robert Louis

From: Chad Incorvia <Chad.Incorvia@swca.com>
Sent: Monday, February 14, 2022 12:17 PM
To: Burnham, Dashell A <dburnham@blm.gov>
Subject: [EXTERNAL] Lila Canyon Mine

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Hi Dashell,

Thanks for chatting with me today about the Lila Canyon Mine expansion.

I've attached the study area map as well as the project location maps from the EA. We are assessing the red highlighted area on the study area map. Please let me know if there are any BLM sensitive species that we should assess in our desktop review and subsequent field habitat assessment.

Thanks!

Chad Incorvia
Project Manager

SWCA Environmental Consultants
510 E Main St.
Vernal, Utah 84078
C 814-671-0698



From: Scott Gibson
To: Chad Incorvia
Cc: Kade Lazenby
Subject: Re: Lila Canyon Bats
Date: Tuesday, March 15, 2022 10:28:45 AM
Attachments: image001.png

EXTERNAL: This email originated from outside SWCA. Please use caution when replying.

Chad,

I regards to bats, I think both Kade and I are comfortable with the impacts, or lack thereof, of the proposed activities. Since there are no expected surface disturbances, the effects would be minimal as we don't expect subsurface bat use in an active mine setting. Given the lack of expected impacts no surveys would be required on our end.

Scott

Scott Gibson
Wildlife Conservation Biologist, Southeastern Region
Utah Division of Wildlife Resources
319 N. Carbonville Rd., Suite A
Price, UT 84501
435-820-6249
segibson@utah.gov

On Tue, Mar 15, 2022 at 9:21 AM Chad Incorvia <Chad.Incorvia@swca.com> wrote:

> Hi Kade and Scott,
>
> I was wondering if you had a chance to look at the EA and if you had any questions or concerns with regards to bats and project disturbance?
>
> As I mentioned I wanted to make sure that there weren't any surveys or field work that would be required for bats for this project.
>
> Thanks!
>
> **Chad Incorvia**
>
> **Project Manager**

SWCA Environmental Consultants
37 E Main St.
Vernal, Utah 84078
C 814-671-0698

From: Chad Incorvia
Sent: Wednesday, March 2, 2022 8:54 AM
To: Kade Lazenby <klazenby@utah.gov>; Scott Gibson <segibson@utah.gov>
Subject: Lila Canyon Bats

Hey Guys,

I really appreciate the conversations we had regarding bats in the area of the Lila Canyon coal mine lease expansion project. I appreciate your time and input.

I wanted to send along some project information for the lease expansion area. As I mentioned this is a long-wall style coal mine with little to no surface subsidence predicted. Attached is the EA that was developed for the project. It contains maps of the lease expansion areas (Pages 3 and 4) as well as a description of the mining methods (Section 2.4.2, Page 13) and the potential surface disturbance (Section 2.4.2.3, Page 16). Please also have a look at the ID Team checklist (Appendix A) to see how the BLM addressed the potential impacts to wildlife and water.

If you have any other questions please let me know.

Thanks,

Chad Incorvia

Project Manager

SWCA Environmental Consultants
510 E Main St.
Vernal, Utah 84078
C 814-671-0698



WordPerfect Document Compare Summary

Original document: V:\WorkingFiles\HP-ProjectBackup\EmeryCountyCoalResources\Permit Area Change\Hydro Information\Appendix 7-3 16-001.wpd
Revised document: V:\WorkingFiles\HP-ProjectBackup\EmeryCountyCoalResources\Permit Area Change\Hydro Information\Appendix 7-3 22-002.wpd
Deletions are shown with the following attributes and color:
~~Strikeout~~, Blue RGB(0,0,255).
Deleted text is shown as full text.
Insertions are shown with the following attributes and color:
Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 24 Deletions, 42 Insertions, 0 Moves.

Appendix 7-3

Probable Hydrologic Consequences Determination

Updated ~~June~~March 20~~16~~22

Probable Hydrologic Consequences Determination

General

The best available adjacent area data to assist in making a determination of probable hydrologic consequences of the proposed Lila Canyon Mine owned by Emery County Coal Resources, Inc. (ECCR) operation comes from the adjacent Horse Canyon Mine, and Columbia Mines. The Columbia Mine has been closed since the late 1960's, and the Horse Canyon Mine has been closed since the mid-1980's. The Horse Canyon Mine has also been reclaimed under SMCRA.

Data gathered from these mines and the surrounding hydrologic regime has been used in this determination, as well as baseline data gathered in the area of the proposed Lila Canyon Mine Extension.

Pertinent water monitoring data for the Horse Canyon Mine and Lila Canyon Extension is included in Appendices 7-1, 7-2, and 7-6 of this application and Appendix VII-1 of the Horse Canyon MRP. Additional recent monitoring data are available from the DOGM electronic database. Baseline geologic information is presented in Chapter 6 of this P.A.P. Baseline hydrologic information, descriptions of the function of the streams and groundwater systems, and discussions of various issues regarding the data are presented in Sections 724.100 and 724.200 of this P.A.P. To ensure that this document addresses these issues, these data, descriptions, and discussions are referenced and should be considered a part of this document.

Mining in the Horse Canyon area began in the late 1930's. Detailed hydrologic information was first gathered in the late 1970's. It is impossible to precisely describe the area's pre-mining hydrology due to the adjacent historical mining. The conditions represented by these data help to define the hydrology about the time SMCRA was passed.

Analysis of Data

Potential impacts of coal mining on the quality and quantity of surface and groundwater flow may include:

- Contamination from acid- or toxic-forming materials;
- Increased sediment yield from disturbed areas;
- Increased total dissolved solids concentrations;

- Flooding or stream flow alteration;
- Impacts to groundwater or surface water availability;
- Hydrocarbon contamination from above ground storage tanks or from the use of hydrocarbons in the permit area;
- Contamination of surface and groundwater from road salting; and
- Contamination of surface water from coal spillage due to hauling operations.

Potential Impacts to the Hydrologic Balance. Potential impacts of the Lila Canyon Mine on the hydrologic balance of the permit and adjacent areas are addressed in the following sections:

Acid- or Toxic- Forming Materials. Information on acid-and toxic-forming materials is presented in Chapter 6. These data show that no acid- or toxic-forming materials are present to the north and south of the Lila Canyon Mine. Given the Lila Canyon Mine will be opened in the same strata as has been disturbed to the north at the Horse Canyon Mine and the Boreholes IPA-1, IPA-2, IPA-3, S-24 and S-25 to the south, no impacts from Acid or Toxic forming materials are anticipated.

Additionally, rocks of the Mesa Verde Group are carbonaceous, resulting in persistence of acids and related toxins in water in the mine and adjacent strata unlikely. Also, the design of the refuse pile will prevent any acid or toxic potential from material removed from the mine. Based upon the hydrology, geology, and climate of the area probability of acid or toxic impacts from materials removed from the mine or from mine water discharge is unlikely. Thus, no significant potential exists for the contamination of surface and groundwater in the permit and adjacent areas by acid- or toxic-forming materials.

Sediment Yield. The potential impact of mining and reclamation on sediment yield is an increase in sediment in the surface waters downstream from disturbed areas. Sediment-control measures (such as sedimentation ponds, diversions, etc.) will be installed to minimize this impact. These facilities will be regularly inspected (see Section 514) and maintained to ensure that they remain in proper operating condition.

The implementation of sediment control measures are mandated to minimize the erosion hazard associated with mining operations. Argument has been presented that reducing the sediment load, while the sediment carrying capacity of the stream

remains the same, can result in increased stream bed and stream bank erosion. This would be true, if the flow rate released to the stream remained the same. However, the use of sediment control structures results in the peak flow released from the site being reduced to a controlled rate which is less that the natural peak flow. Therefore, the sediment carrying capacity of the stream is correspondingly reduced. Additionally, the duration of the lower rate controlled release from the sediment control structures aids in enhancing the development of vegetation along the stream banks which provides additional stabilization of the channel banks and bed. While the bed and bank impacts are not anticipated, the applicant has agreed to monitor the conditions of the channel downstream of the site for geomorphic and erosional change as a result of mine discharges.

All construction and upgrading activities will be undertaken during periods of dry weather, commencing in late spring and lasting through fall. For both the mining and reclamation periods, it is expected that construction, upgrading, or regrading activities would cause an increase in sediment load to the stream. Temporary sediment controls will be used whenever possible to lessen the impact of construction activities.

Stream buffer zones have been delineated upstream and downstream of the disturbed area of the mine facilities. These buffer zones will aid in ensuring that no disturbance occurs within the area of the unprotected channel. While these buffer zones are planned and will be installed and maintained for the intermittent by definition stream, it should be recognized that the reach of the channel that is being protected is ephemeral in nature and is not an intermittent or perennial nature reach (see Appendix 7-7 for characterization of the streams).

Subsidence tends to cause a warping or sagging of the surface in the area of the mined out area. Within the stream channel that crosses a subsided area, at the upstream boundary of the subsidence, the stream channel is steepened, resulting in the potential for additional erosion in the steepened reach. As the stream crosses the sagged subsided area, the channel gradient decreases below the pre-subsided slope. This results in increased glides and extended pools in intermittent and perennial streams or areas of increase deposition in ephemeral streams. Subsidence cracks which intersect stream channels with steep gradients could, for a short period of time, result in a local increase in the sediment yield of the stream. However, this sediment increase would also cause the crack to quickly fill, recreating pre-subsidence stream channel conditions. Thus, the potential impact to sediment yield from subsidence in the permit area would be minor and of short duration.

Various sediment-control measures will be implemented during reclamation as the vegetation becomes established. As discussed in Section 542.200 of this P.A.P., these measures will include installation of silt fences and straw-bale dikes in

appropriate locations to minimize potential contributions of sediment to the Right Fork of Lila Canyon. These measures will reduce the amount of erosion from the reclaimed areas, thereby precluding adverse impacts to the environment.

Acidity, Total Suspended Solids, and Total Dissolved Solids. Probable impacts of mining and reclamation operations on the acidity and total suspended solids concentrations of surface and groundwater in the permit and adjacent areas were addressed previously in this section. Since the proposed Lila Canyon Mine has not started, there is no specific data available on Lila mine water. Therefore, quality information was obtained from the adjacent Horse Canyon Mine workings was used to be representative of the water quality expected in the Lila Cayon Mine. This is due to the mines being adjacent to each other and the same geologic strata being mined..

Data presented in Appendices 7-1 and 7-6 and summarized in Section 724.100 of this P.A.P. indicate that the TDS concentration of water in the Blackhawk Formation (as measured in inflow to the nearby Horse Canyon Mine) ranged from approximately 1400 to 2400 mg/l and is of the sodium-bicarbonate type. As noted in Section 724.200, the TDS concentration of water in the Right Fork of Lila Canyon is unknown, but likely to be similar to the flows in Horse Canyon Creek which are in the range from 1200 to 1500 mg/l. This comparison is justified due to the similar exposures of strata that both stream flow across and the similarity in the watershed conditions. The dominant ions in this water are calcium and bicarbonate during high-flow periods, whereas the dominant ions during low-flow periods are sodium, magnesium, sulfate, and bicarbonate.

These data suggest that the TDS concentration of water in the Right Fork of Lila Canyon can be expected to increase by a factor of 1.5 for the water discharged from the mine to the drainage. This concentration is similar to concentrations found in other streams along the Book Cliffs as described by Waddell, et. al. (1986). It should be noted that it is anticipated that differnet than many of the historic mines in the Book Cliffs, the Lila Canyon Mine will use powdered limestone or dolomite (i.e., calcium-magnesium-carbonate) for rock dust. The historic mines used gypsum rock dust (calcium-sulfate) which raised the TDS of the discharge water. Hence, dissolution of rock dust by water in the mine should not influence the chemical type and concentration of water in the drainage if mine water is discharged to the Right Fork of Lila Canyon.

As indicated in the P.A.P., the total iron and manganese concentrations in potential discharges from the mine are not significantly elevated to an effect downstream uses. Also, as discussed in Appendix 7-9, the worst case mine water discharge rate is expected to affect only 8.5 miles downstream from the mine.

Lila Canyon drainage, as part of the lower Price River basin, is classified according to Section R317-2-13 of the Utah Administrative Code (Standards of Quality for Waters of the State) as a class 2B (secondary contact recreation use), 3C (nongame fish and other aquatic life use), and 4 (agricultural use) water. No TDS standards exist for class 2B and 3C water. The TDS standard for class 4 water is 1,500 mg/l. Hence, if discharges occur from the Lila Canyon Mine to the Right Fork of Lila Canyon, the data indicate that the TDS concentration of these discharges will slightly exceed the agricultural use water-quality standard.

As there is limited agricultural use in the area, this TDS exceedance is not considered significant. The major usable water resources in the area that could potentially be affected are springs and ephemeral channels. These water sources are used by wildlife and livestock. Most of these sources are locate upstream of the proposed discharge point. Therefore, there would be no impact to these existing sources. Additionally, the quality of water discharge from the mine is expected to be significantly better than the other waters which occurs from the Mancos Shale which downstream agriculture currently uses (TDS ranging from 2200 to 4800 mg/l).

Concerns have been raised that there might be impacts of increased salinity from the solution of salts from the Mancos Shale. While it is likely that a small increase in TDS from salts picked up from the Mancos Shale, this is not expected to be a significant problem. Appendix 7-9 includes a calculation of how far a worst case constant mine discharge would be expected to flow. This flow rate is thought to be higher than the expected discharge amount, but it does provide a worse case estimate. Because of infiltration, evapotranspiration, and percolation, the mine discharge effect is limited to a distance of 8.5 miles and is not expected to reach the Price River. Therefore, it is not expected that any salinity increase would affect downstream perennial waters.

It should also be noted that the dissolved iron standard for class 3C water is 1.0 mg/l. No dissolved iron standard exists for class 2B or 4 waters. The data presented above indicate that potential discharge water from the mine will not exceed the dissolved iron standard of Lila Canyon. No standards exist in the R317 regulations for total iron, dissolved manganese, or total manganese. However, the data presented above indicate that potential discharges from the mine to the Right Fork of Lila Canyon will meet the effluent limitations of 40 CFR 434.

No hydrologic impacts have been noted at the adjacent Horse Canyon Mine due to subsidence. Although tension cracks may locally divert water into deeper formations, resulting in increased leaching of the formation and increased TDS concentrations, the potential of this occurring is considered minimal. This conclusion is based on experience at the Horse Canyon Mine and on the fact

that the shale content of the North Horn Formation, the Price River Formation, and the Blackhawk Formation should cause these subsidence cracks to heal quickly where they are saturated by groundwater flow. Thus, potential impacts on TDS concentrations would be minor and not of significant concern.

Flooding or Streamflow Alteration. Runoff from all disturbed areas will flow through a sedimentation pond or other sediment-control device prior to discharge to the Right Fork of Lila Canyon. Three factors indicate that these sediment-control devices will minimize or preclude flooding impacts to downstream areas as a result of mining operations:

1. The sedimentation pond has been designed and will be constructed to be geotechnically stable. Thus, the potential is minimized for breaches of the sedimentation pond to occur that could cause downstream flooding.

2. The flow routing that occurs through the sedimentation pond and other sediment-control devices reduces peak flows from the disturbed areas. This precludes flooding impacts to downstream areas.

3. By retaining sediment on site in the sediment-control devices, the bottom elevations of the Right Fork of Lila Canyon downstream from the disturbed area will not be artificially raised. Thus, the hydraulic capacity of the stream channel will not be altered.

The volume of streamflow will increase in the Right Fork of Lila Canyon if water is discharged from the mine to the drainage. Potential impacts to the drainage channel could include the displacement of fines on the channel bottom, and minor widening of the channel. However, the degree of widening will likely be minimized by the increased vigor and quantity of vegetation which will be sustained along the stream channel by the increased availability of water. In particular, it is anticipated that a phreatophyte streambank vegetative community will develop as a result of mine-water discharges. This effect will occur for the distance downstream that surface flows can be sustained above channel transmission losses. Based on the maximum anticipated estimate of mine water discharge, it is unlikely that any flooding will occur to the downstream channel as the flows (1.1cfs and 4.63cfs) are significantly below the bankfull conditions of the channel. Care will be taken during discharge of this water to avoid erosion at the discharge point or flooding of downstream areas. Once mining ceases, the mine will be sealed and no discharges will occur. The streamflow in the Right Fork of Lila Canyon will then return to pre-mining discharge levels. Downstream impacts from such discharge will be limited to the establishment of a temporary riparian area along the stream channel. The flows are expected to be below the flow threshold to result in changes to the stream channel.

Following reclamation, stream channels which have been altered by mining operations will be returned to a stable state (see Section 762.100). The reclamation channels have been designed to safely pass the peak flow resulting from the 10-year, 6-hour or the 100-year, 6-hour precipitation event as appropriate for the channel and in accordance with the R645 regulations. Thus, flooding in the reclaimed areas will be minimized. Interim sediment-control measures and maintenance of the reclaimed areas during the post-mining period will preclude deposition of significant amounts of sediment in downstream channels following reclamation, thus maintaining the hydraulic capacity of the channels and precluding adverse, off-site flooding impacts.

Subsidence tension cracks that appear on the surface will increase the secondary porosity of the formations overlying the Lila Canyon Mine. During the period prior to healing of these cracks, this increased percolation will decrease runoff during the high-flow season (when the water would have rapidly entered the stream channel rather than flowing into the groundwater system). During low-flow periods, the result of this increased percolation will be an increase in the base flow of the stream. Hence, the net result will be a decrease in the flooding potential of the affected stream.

An additional flooding issue is the potential for flooding of the mine following mining and the discharge of water from the portals. Since the regional geology and hydrologic regimes of the Horse Canyon and Lila Canyon Mines are so similar, data has been extrapolated from the Horse Canyon Mine to the proposed Lila Canyon Mine. The proposed Lila Canyon Mine portals are located up-dip from areas in the mine where water may be expected; therefore, the only mine water expected to reach the surface is that which is pumped. Mine water is not expected to reach the portal level or flow from the reclaimed portal level or flow from the reclaimed portals of either the reclaimed Horse Canyon Mine or the Lila Canyon Mine based on the following information:

1) Mine water level information gathered in 1986 and 1993 indicates that there has been little rise in the water level since mining activities ceased.

2) The Sunnyside Fault is not a large producer of water. As an example, the Columbia Mine located north of the Horse Canyon Mine also encountered the Sunnyside Fault zone and has been closed since the late 1960's. If water inflow rates were high, the mine workings would have flooded, developing a head differential between the Columbia Mine and the Horse Canyon Mine (pumped). If the fault zone were a good conductor of water, the inflow to the Horse Canyon

Mine would have been high, driven by the head from the flooded Columbia Mine Workings. However this was not the case and the water levels have not flooded much beyond the water levels in the Horse Canyon Mine while it was pumped. Suggesting that there is no head to cause a flooding rise and that the Sunnyside Fault is not a significant conduit for water flow.

3) Sieler and Baskins (1986) showed that the water quality for natural waters generally drops significantly when exposed to mine workings (gob, etc). The water quality of the mine water samples from the Horse Canyon Mine sump locations (2 Dip, Main Slope, 2E-B) as compared to the water quality of springs in the lower stratigraphic section of the Horse Canyon permit area show little difference in TDS. This indicates that majority of the water in the mine is not the result of inflow along the fault zone from the Columbia Mine. Suggesting that the fault zone is a poor conductor of water for the poorer quality water expected from the flooded Columbia Mine workings or that the Columbia Mine workings have not flooded much beyond the water levels in the Horse Canyon Mine while it was pumped.

4) The three Piezometers, IPA-1, 2 and 3 shown on Plate 7-1, follow the geologic structure of the formations making up the Book and Roan Cliffs and suggest that the gradient is down dip away from the portal area. The Piezometer readings can be found in Appendix 7-1.

5) The coal mined at Horse Canyon (as well as that at Lila Canyon) is underlain by a marine sheet sandstone (Sunnyside, see Geology, Chapter VI). Lines (1985) did extensive petrographic work on porosity and permeability in the formation (see Table 1). If the water level in the mine were to ever approach the level of the portal, the Sunnyside marine sandstone would likely discharge water, preventing any head development behind the portal closures.

6) Much of the Horse Canyon Mine floor has been fractured by the effects of pillar removal, especially near the outcrop. Fracturing develops secondary porosity and enhances the permeability of the underlying Sunnyside marine sandstone. This would function as a means to dissipate any head which

might otherwise develop on the portals. The proposed longwall mining in the Lila Canyon Mine is also expected to produce floor fracturing.

7) There is a difference in elevation of about 400 to 500 feet between the lowest portal and the approximate water level in the Horse Canyon mine (1986 and 1993). If the water level in the mine continues to rise, the head differential between the discharging aquifer and the mine will decrease. The decrease in head will have the direct effect of decreasing the inflow rate into the mine. Additionally, the volume of water required to "fill the mine" would also have to fill the strata above the mine, which has been dewatered throughout the history of the mine.

Based on these factors it is unlikely that the groundwater level in the lower groundwater zone will ever rise to the level of the portal, at any portal location for either the Horse Canyon or Lila Canyon Mines. Hence, there should be no natural discharge of groundwater through any of the sealed portals. To verify this, stand pipes will be incorporated into the grading plans for the portals so that water levels can be checked annually.

Groundwater and Surface Water Availability. Potential impacts to the availability of surface and groundwater from the Lila Canyon Mine operations include both decreased and increased stream flows and spring discharges caused by mine-related subsidence, bedrock fracturing, and aquifer dewatering. These potential impacts are discussed below.

Potential for Decreased Spring and Stream Flows

To date, while surface subsidence has been identified as a result of coal mining in the nearby Horse Canyon Mine, no impact or disruption of spring and seep or stream flows have been identified. Bedrock fracturing routinely occurs, depending on the overburden thickness, in the rock units overlying mined coal seams. As discussed in the MRP, Section 724.100, the groundwater zones in the proposed mine area is divided into two zones. The upper, active zone consists of discontinuous, localized perched zones which are separated vertically from the coal or any deeper, inactive groundwater bearing zone. ~~This~~The upper active zone is monitored by the spring sampling. The deeper, inactive zone of groundwater consists of the Sunnyside sandstone underlying the coal seam. This zone contains groundwater that is under pressure and is the zone monitored by the monitoring wells. Given the limited number of springs and limited groundwater resources of the Castlegate Sandstone and Blackhawk Formations in the permit

and adjacent areas, there is essentially no connection between the upper and lower zones. Therefore, subsidence or fracturing would affect the hydrologic balance in the area only if zones of increased vertical hydraulic conductivity were created which extended through the Castlegate sandstone and Price River Formation into the overlying North Horn-Flagstaff and Colton Formations.

For areas that are just mined using Continuous Miners, there is little concern with subsidence. This is due to the support that the pillars provide to the overlying rock. Generally, subsidence concerns occur during longwall mining activities. When subsidence occurs as a result of mining, there are four zones that occur above the mined out area. As shown in Figure 1, the zones are: a caved zone that occurs in the 6 to 10 times the thickness of the coal seam, a fractured zone which occurs 10 to 30 times the thickness of the coal seam, and deformation zone which occurs 30 to 60 times the thickness of the coal seam, and finally, a soil zone which occurs on the ground surface. Damage to surface and groundwater resources generally occur in the caved and fractured zones. Little or no damage occurs in the deformed zone. With only localized effects felt in the soil zone. As discussed in Section 525.120, the strains for the rock in the proposed mine area, as a result of mining, should limit subsidence deformation to those areas where the overburden is less than 630 feet.

Where surface disruption or cracks appear, the general mechanism is extension of the soil mantle. Natural processes will heal these crack over time. Runoff and snowmelt will wash sediments into the crack and fill any voids created. As this process progresses, the crack disappear and the surface runoff and snowmelt return to normal courses. In the Wasatch Plateau and Book Cliffs area, the clays in the area are expansive and tend to seal these cracks very rapidly. Sidel, et.al. (1996) found that minor surface changes in the area of Burnout Creek recovered within two years.

As indicated in ~~Figure~~Figures 7-1, 7-1a, and 7-4 of the PAP, the majority of the identified springs and seeps are located outside of the maximum limits of subsidence. Therefore, the potential impact is significantly reduced. Where springs are located within the maximum limits of subsidence (L-9-G), the overburden thickness is estimated to be greater than 1500 feet. Therefore, in these areas, subsidence strains, as described in Section 525.120, will not be enough to result in surface rupture or deformation. Thus, potential impact to the springs within the area of subsidence is not expected.

Concerns have been raised regarding the potential impact from subsidence on state appropriated water in the Right fork of Lila Wash, Stinky Wash, and Water rights 91-2617 through 91-2621. As discussed in the MRP, Section 724.200, these water rights are associated with stock ponds. These stock ponds are

located off the main channel, in small side tributaries. A recent site visit with DOGM personnel confirmed the locations of the stock ponds and associated water rights. As these ponds are located off the main channel and do not have diversions from the main channel, none of these pond will store water from the proposed permit area. Therefore, there can be no subsidence impact to the water rights downstream of the proposed permit area. As part of the subsidence monitoring plan, the area of the streams will be visually inspected during periods of 2nd mining and 3 months after to determine if any impacts occur. If impacts are identified, the mitigation plans described in Chapter 5 will be implemented.

Several lines of evidence suggest that mining-related subsidence and bedrock fracturing have not resulted in decreased stream flows or groundwater discharge in the vicinity of the nearby Horse Canyon Mine. Although considerable seasonal and climatic variability are noted in the hydrographs of springs in the permit and adjacent areas, data for both Horse Canyon Creek and springs which overlie the Horse Canyon Mine workings do not show discharge declines which may be attributed to either subsidence or bedrock fracturing (see Appendices 7-1 and 7-6).

Active groundwater systems in the Colton~~,~~ and Flagstaff-North Horn~~, and Price River~~ Formations are separated from the Blackhawk Formation by the Castlegate Sandstone and Price River Formation. As discussed in Section 724.100, ~~this~~these formations contains no or very few springs and ~~is~~are not considered to be ~~a~~ major groundwater resources. Past mining in the Horse Canyon Mine has not increased the rate of spring discharge from the Price River Formation, indicating that groundwater from the overlying formation is not being diverted into this formation. The absence of increased saturation in the Price River Formation indicates that vertical zones of artificially-increased hydraulic conductivity or secondary porosity do not extend into the Price River Formation and from thence into the overlying active groundwater systems of the North Horn-Flagstaff Formations.

Data presented in Appendices 7-1 and 7-6 and summarized in Section 724.100 indicate that the low-permeability lower groundwater system, in the vicinity of mined coal seams, contains groundwater which is compartmentalized both vertically and horizontally. Coal mining locally dewaters isolated, overlying saturated rock layers in the Blackhawk Formation but does not appear to draw significant additional recharge from overlying or underlying zones.

Additionally, the springs which supply most of the local flow discharge from the upper discontinuous perched aquifers in the Flagstaff-North Horn or Colton Formations. These springs or groundwater zones receive snowmelt and precipitation recharge from local areas above each spring. The recharge area for

each spring is limited, as evidenced by the limited flow rates, decreasing flow through the year, ansd steep topography above them. Also they are perched above the underlying lower groundwater zone and the intervening formations contains swelling clays which tend to heal small fractures. Since the perched aquifer materials are isolated both vertically and horizontally and are lenticular in nature, there is a greater probability that fractures in one area will not drain all the different perched aquifers because they are not interconnected. As the strains from subsidence are not expected to reach the level of the upper groundwater zone, there is little chance that the recharge of these springs might be affected.

TAdditionally, the very low permeability and vertical gradients in Blackhawk Formation rock layers underlying actively mined coal seams in the Horse Canyon Mine and the absence of significant percolation or discharge into the mine from these underlying layers indicates that mining does not draw groundwater from the underlying portions of the Blackhawk andor Mancos Shale. Additionally, the distinctive solute composition of Mancos Shale groundwater has not been observed inside the Horse Canyon Mine indicating that the saturated zones in the Blackhawk and Mancos are separate.

From the above discussion, it appears that the Horse Canyon Mine has not decreased groundwater discharge in overlying or underlying groundwater systems. Since the conditions of the springs in the area of the Lila Canyon Mine are the same, with the same strata, it is unlikely that coal mining will effect the discharges of any spring as a result of mining in the Lila Canyon permit and adjacent areas.

Concern has been raised that the mining might impact flows in the Range Creek basin. This issue has been addressed in the MRP, Section 724.200, Pages 29-33. As discussed in the MRP, the five to six miles horizontal distance from proposed permit area to Range Creek (see Plate 7-1a) and the isolating effects of the over 1,000 feet of low-permeability, isolating strata between the coal seam and the creek elevation (see Plate 7-1B and Table above) and the limited potential impact of subsidence damage to the recharge area, it is not likely that the Lila Canyon Mine will adversely effect Range Creek. Due to these conditions, no baseline or other sampling has been gathered nor is anticipated on Range Creek. For the above reasons Lila Canyon extension does not present any Probable Hydrologic Consequences to Range Creek.

The contamination, diminution, or interruption of any water resources would not likely occur within the mine permit or adjacent areas. Since surface water flows only a limited part of year and will be provided protection by use of sediment controls, the major usable water resources that could potentially be effected in the area would be springs that are currently in use by wildlife and livestock. Most of

these springs are located upstream of the permit area or are in areas where subsidence resulting from post-1977 mining is not documented or expected. To date no known depletion of flow and quality of surveyed springs in the Horse Canyon permit area exists, and none are expected in the Lila Canyon area, based on available data from the Horse Canyon Mine. Although pre-mining data is not available for Horse Canyon, depletion problems from subsidence are not known to have been filed and are not indicated by sampling results in Appendices 7-1 and 7-2. Therefore, it is unlikely an alternative water supply will be needed, although they have been identified in Section R645-301-727.

L-16-G and L-17-G are seeps being monitored in Stinky Spring Canyon located at the toe of the escarpment of the Book Cliffs. Bighorn sheep have been observed within the canyon but have never been observed drinking the water. ~~-~~

~~Flows from these springs are historically less than 0.5 gpm and show a general seasonal decrease throughout the season. These sites were not identified during baseline surveys and are believed to exist intermittently and are not always evident. The low flow rates and intermittent nature of these springs suggest that they are local in nature.~~

~~These springs~~No springs have been observed from bedrock in the Central Graben or Williams Draw Fault areas at the top of the escarpment.

These seeps are located within the Central Graben Fault area, which is a displacement block that has been downdropped between 145 and 250 feet relative to the adjacent bedrock. They occur near the contact between the Mancos Shale and the overlying Blackhawk Formation. The fractured nature of the bedrock along the edges of the Central Graben fault block, as a result of the faulting, likely are the limits of the areal extent of the recharge or source area to the ~~springs~~seeps. The low-permeability of the surrounding Mancos Shale likely isolate the ~~graben~~ block from groundwater in the surrounding bedrock. Thus, the recharge to the ~~springs~~seeps is likely limited to the area of the consolidated ~~graben block.~~
fault block.

This limited flow and lack of significant springs in the faulted area is likely due to the dip of the strata into the cliffs and the downgradient formations being able to accept the groundwater flow that does get recharged to the deeper, inactive zones.

Flows from the springs and seeps throughout the Lila and Williams Draw areas are historically less than 0.5 gpm and show a general seasonal decrease throughout the season. Many of these sites were not identified during baseline

surveys and are believed to exist intermittently and are not always evident. The low flow rates and intermittent nature of these springs suggest that they are local in nature. This is indicated by the flow in LS-002 along the southeastern portion of the lease area. Back in 1993-95 there was no flow idenfiied during the spring and seep surveys that were conducted. However, in the period from 2008 through 2011, LS-002 was regularly flowing as idenfied in the Williams Draw surveys. Since 2011 the flow at this spring has been decreasing and since 2016, there has been no flow from the spring.

As indicated previously, there is no evidence that mining in the Horse Canyon Mine had any influence on the underlying formations. Therefore it is likely that the Lila Canyon Mine would have similar affects. Due to the springs location and lateral separation from the mine, outside the permit area, outside the limit of subsidence, being separated from the mine block by faulting within the Central Graben area, and being 500 to 600 feet below the coal seam, there is no potential for Lila Canyon Mine to negatively impact this spring or recharge sources.

Based on the review of the information presented in section 724.100 of the MRP, there does not appear to be any regional groundwater zone in the upper, active zone. The upper groundwater zone is a series of discontinuous, lenticular, isolated perched zones with limited recharge. Generally each zone is isolated, both horizontally and vertically, from those surrounding it. This upper zone is separated vertically from the lower zone in the Sunnyside Sandstone by the Castlegate Sandstone and Price River Formation. No impacts to the function and quality of the springs in the upper zone are anticipated from mining subsidence.

The underlying groundwater zone is not used for any purpose and has limited ability to produce water due to the low hydraulic conductivity and the depth to water from the top of the Book Cliffs. While this lower zone contains water, it does not meet the definition of an aquifer as indicated above (see discussion in Section 724.100 of MRP).

Potential for Increased Stream Flows

If sufficient water is encountered in the Lila Canyon Mine workings to require discharge of that water to the surface, the flow of the Right fork of Lila Canyon will be increased. This flow could be ultimately to the Price and Green Rivers. The impact of such discharge by the development of the Lila canyon extension would be quite limited.

The majority of water discharged from the mine would be water held in storage in the saturated zones above the coal seam. It is unlikely that any water below the coal seam would be affected or drained by the mine workings.

It is difficult to estimate the maximum potential discharge from the mine, however, DOGM has determined that a maximum long-term discharge rate of 500 gpm should be used for design purposes. Additionally, ~~UEI~~ECCR has determined that when crossing the Horse Canyon entries storage groundwater will be encountered and a worst case temporary discharge of 2,080 gpm may be released for a period. Appendix 7-9 estimates that a worst case constant 2,080gpm discharge would extend as surface flow for about 3 miles downstream and as subsurface flow a maximum of 8.5 miles downstream of the mine.

Under the absolute worst case conditions, if this discharge were to extend to reach the Price River, based on this discharge rate, during the life of the operation, the water extracted would be 100,580 ac-ft of water or approximately 3,350 ac-ft per year. Discharge for the Price River at Woodside has a mean annual flow of 88,000 ac-ft/yr. Discharge for the Green River at Green River has a mean annual flow of 4,484,000 ac-ft/yr. Therefore the average discharge at 2,080 gpm from the mine would be 3.8% of the Price River flow volume and 0.075% of the Green River flow volume. Given the standard fluctuations in the stream flows, this small flow addition would have little effect on the streams.

It should be emphasized that the 2,080 gpm estimate is considered to be conservatively high. The adjacent Horse Canyon Mine had a maximum discharge of 90 gpm. While the Soldier Canyon Mine farther to the north in the Book Cliffs, the rate of water discharged was estimated to be 15,000,000 gallons per year (approximately 30 gpm).

If water does need to be discharged, it will be sampled and discharged in accordance with the approved UPDES Discharge Permit. If the quality parameters of the mine water do not meet UPDES standards, the water will be treated prior to discharge. Treatment may include holding/settling in the mine, pumping to retaining or sediment ponds, chemical treatment or other approved means to prevent non-compliant discharge.

Based on the results of the evaluation presented in Appendix 7-9, the discharge of this amount of water from the mine is not expected to have a significant impact on the downstream resources. Based on the results from Appendix 7-9, the mine discharge flow will be lost due to evapotranspiration, transmission losses, and percolation within 8.5 miles from the discharge point. Therefore, the discharge will not reach the Price, Green, or Colorado Rivers. The discharge of the water

will have a temporary positive impact on the vegetation and wildlife of the area by providing a fairly constant supply of water along this limited reach of the channel.

Based on comparison of upstream and downstream data gathered on Horse Canyon Creek which incorporates the analysis from past mine discharges to the channel, water quality will not be drastically affected in the intermittent drainage in the event of discharge of mine water into the channel. The expected impacts to the channels of the Lila Canyon area are very likely to be similar to those at Horse Canyon due to the close proximity, and similarities of mining and drainage conditions.

Concerns have been raised regarding the character of the streams in the area. Utah still uses the Office of Surface Mining two part definition of intermittent streams -

> "means (a) a stream, or reach of a stream, that drains a watershed of at least one square mile, or (b) a stream, or reach of a stream, that is below the local water table for at least some part of the year and obtains its flow from both surface runoff and groundwater discharge." Utah Admin Code R645-100 (2006)

The first part is an arbitrary size determination, while the second part is a scientific definition. While the drainage areas of several of the streams within the proposed permit area are greater than one square mile, the character of the flows in all the channels are ephemeral in nature. Colorado, Montana, New Mexico, and Wyoming regulatory programs have changed their rules to use the scientific definition for an intermittent stream and do not use an arbitrary size to determine the flow condition of a stream.

The stream channels on and adjacent to the Lila Canyon Mine permit area have been characterized in Appendix 7-1, Appendix 7-7, Appendix 7-10, Table 7-1A, Table 7-2 and Table 7-1C to be naturally ephemeral. Perennial and intermittent streams yield a flow that is mostly continuous and dependable, known as baseflow. Baseflow is a water supply from groundwater that keeps flow in the stream channels after snowmelt and rainfall runoff has ended. Perennial stream channels have a baseflow year around, while intermittent streams maintain a baseflow during part of the year, usually during spring and early summer. A stream with baseflow has a more dependable water source that can support more vegetation, wildlife, agriculture and industry. Ephemeral stream channels do not have a baseflow. They do not support lush vegetation, wildlife, agriculture or industry. All the stream channels draining from the Lila Canyon permit area do not have a baseflow, except immediately next to springs, as discussed earlier. There are no water rights filed down stream of the mine site that can be impacted from mining operations.

Appendix 7-7 presents the characteristics of the channels within the proposed permit area. The characterization is based on the definition of ephemeral streams in the DOGM rules. Reaches of these streams flow only in response to direct precipitation and based on monthly monitoring at no point in the year does the groundwater table extend above the bottom of the channel to provide baseflow to the channel. Therefore, the channels fit the criteria for ephemeral drainages. While DOGM rules for drainages greater than one square mile stipulate that these drainages are to be considered intermittent in nature, that does not change the flow characteristics of the drainages.

The intermittent stream definition creates a problem of expectation. An intermittent stream is expected to have flow for a period of the year when the water table is above the ground surface. As such a standard monthly surface water monitoring program should and would be able to sample the flows. An ephemeral stream which does not flow as a general rule, but only in direct response to precipitation events or significant snowmelt, would be expected to be dry. Therefore, a standard monthly monitoring program would not result in flow data except on a very infrequent basis.

As a result, concerns regarding the lack of flow data have been raised for the intermittent streams within the permit area. For these are intermittent streams, it has become an issue as to why no flow and water quality data has been collected. As indicated above, these streams may be defined as intermittent, but they function as ephemeral drainages. For ephemeral streams, the standard condition for the channel is dry. The monthly monitoring has provided data which document the lack of flow. The flow modeling, described in the MRP section 724.200 for the watersheds within the permit area, suggests that for short duration, frequent storms (2 to 10 yr), while the watershed would be wetted, no generally concentrated flow would be evident. Higher frequency, longer duration events (10yr +) would result in increasing amounts of runoff. Therefore, for a short period (less than 10 years), the expected flow condition for an ephemeral character stream would be no flow.

Based on the data from the Western Regional Climate Center, presented in MRP section 724.400, the probability of precipitation events capable of generating runoff is very low. Table 7-1C shows that the probability of a 1-day event with more than 0.5" of runoff is less than 5 percent. According to the flow simulations in section 724.200, runoff is not common in storms with less than 1.2 inches of rainfall (10 year event).

Also, the lack of monthly water monitoring data for the period of December and January for most years was raised as a concern. Generally, the access to the sites is prevented by snow. This is not considered a significant problem due to the

general lack of precipitation and flow during this period. Average precipitation at Sunnyside during December and January is generally under 2 inches of precipitation of the annual average of over 14 inches (see Table 7-1B). Average maximum temperatures during December and January at Sunnyside are reported to be around freezing (see Table 7-1B). At the mine site, the elevation is higher, therefore, the temperatures would be lower. Thus, any precipitation would generally be in the form of snow which would not result in a runoff event. Any snow melt which might occur would be at a very slow rate which would also not result in runoff, but would likely ripen the snowpack and locally infiltrate into the soil.

Further, a concern regarding the identification of seasonal variation in flows and water quality has been raised. Based on the monthly monitoring, there has been no consistent or seasonal flows identified in any of the drainages in the proposed permit area. Thus, the modeling presented in the MRP section 724.200 is representative of the flows in the drainages. These are characterized by infrequent runoff events from isolated, heavy precipitation occurrences with very limited durations. Based on these types of runoff events, the drainages are ephemeral in nature and the use of the downstream waters is very limited. This is evidenced by the limited number of State appropriated waters in the downstream drainages (see Plate 7-3). There are no water rights with flow diversions found on the downstream drainages which collect water from the proposed permit area. A series of stock ponds are found within the Grassy Wash drainage. Information from the BLM presented on Plate 7-3 show the stock ponds and the associate water rights. A series of four ponds have been constructed for which there are no water rights. As discussed in Section 724.200,of these ponds, only one had a diversion structure on the main stream channels that flow from the permit area. Based on a site visit in January 2004, a pond, labeled Blaine's Folley reservoir, was found silted in, though a new diversion works had been constructed at the confluence of the Right Fork of Lila Canyon and Grassy Wash. In checking with the BLM personnel, the pond improvements were not part of agency range improvements. Recent site visits have shown that the diversion structure in the Right Fork of Lila Canyon have been breached. This will result in very limited flow reaching this pond. Given the lack of flow from the permit area to these ponds, there is little impact that could be caused by the mining activities.

Potential Hydrocarbon Contamination. Diesel fuel, oils, greases, and other hydrocarbon products will be stored and used at the site for a variety of purposes. Diesel and oil stored in above-ground tanks at the mine surface facilities may spill onto the ground during filling of the storage tank, leakage of the storage tank, or filling of vehicle tanks. Similarly, greases and other oils may be spilled during use in surface and underground operations.

The probable future extent of the contamination caused by diesel and oil spillage is expected to be small for three reasons. First, because the tanks will be located above ground, leakage from the tanks will be readily detected and repaired. Second, spillage during filling of the storage or vehicle tanks will be minimized to avoid loss of an economically valuable product. Finally, the Spill Prevention Control and Countermeasure Plan which will be developed for the site will provide inspection, training, and operation measures to minimize the extent of contamination resulting from the use of hydrocarbons at the site. This plan is not required to be submitted. However, a copy will be maintained at the mine site as required by the Utah Division of Water Quality.

Road Salting. No salting of roads will occur within the permit area. Hence, this impact is not a significant concern.

Coal Haulage. Coal will be hauled over the county road from the mine portal area to Utah Highway 6 and thence to its ultimate destination. In the event of an accident which causes coal to spill from the trucks, residual coal following cleanup of the spill may wash into local streams during a runoff event. Possible impacts to the surface water are increased total suspended solids concentrations and turbidity from the fine coal particulates. The probability of a spill occurring in an area sufficiently close to a stream channel to introduce coal to the stream bed is considered small.

In addition to spills, wind may carry coal dust or small pieces of coal from the open top of the coal trucks into drainages near the roads. The impact from fugitive coal dust is considered to be insignificant due to the small amounts lost during haulage in the permit and adjacent areas.

Water Consumption. The USFWS have identified that water consumption by underground coal mining operations could jeopardize the continued existence of and/or adversely modify the critical habitat of the Colorado River endangered fish species: Colorado pikeminnow, humpback chub, bonytailed chub, and razor back sucker. The USFWS has determined that water consumption by underground operations could potentially have adverse effects on the Colorado River basin. The USFWS considers consumption to include: evaporation from ventilation, coal preparation, sediment pond evaporation, subsidence on springs, alluvial aquifer abstractions into mines, postmining inflow to workings, coal moisture loss, and direct diversions. These consumption process are discussed below.

<u>Bath House/Office</u>
It has been estimated that the Bath House/Office will consume approximately 35 gallon per day per person for shower and human consumption. This estimate results in a usage of 1,260,000 gal/yr or 3.86 ac.ft.yr.

Evaporation from Ventilation - evaporation rates have been estimated at 2.5 gallons per million cubic feet of ventilated air. This number is dependent on temperature and relative humidity. It is estimated that with the projected usage of 473,040 million cf/yr of air and a loss of 2.5 gallons per million c.f. Therefore, the water consumption for evaporation would be approximately 1,183,600 gallons per year or 3.63 acre feet of water.

Coal Preparation - The operator does not anticipate any coal preparation that would result in water usage.

Sediment Pond Evaporation - The sediment pond is used to hold rain and snow runoff that flows over disturbed areas of the coal mining and reclamation operations until accumulated sediment has dropped out. At that point the water is discharged into a receiving stream. The holding time for this water is planned to be short, therefore, no significant evaporation loss is expected. This would not be considered a consumption mechanism.

Subsidence on Springs - As shown in Appendix 7-8 and discussed in Section 525.120 of the application, the majority of springs cannot be adversely effected by subsidence because of their physical location (off the permit area and outside the area of potential subsidence) or for those within the permit area because of the amount of cover, 1000 feet or more, which as discussed in Section 525.120 are not expected to experience any significant deformation for covers over 630 feet. In the adjacent Horse Canyon mine, which was mined for over 45 years, there have been no reported effects on springs due to subsidence.

Alluvial Aquifer Abstractions into Mines - There will be no water infiltrations from alluvial systems into the mine.

Postmining Inflow to Workings - Postmining all openings will be sealed and backfilled. The proposed mine openings for Lila Canyon are at an elevation where no surface inflow is possible. This coupled with the sealing plan for the portals makes postmining inflows virtually impossible.

Coal Moisture Loss - It has been estimated that coal moisture loss or usage to be estimated at 4.5 gallons per ton of coal mined (see Table 2). Using the estimated usage for mining with an estimated production of 4.5 Million tons per year a usage of 20,250,000 gal per year or 62.12 acre feet can be estimated. It should be noted that due to the extremely low hydraulic conductivity rates measured in the general area, that groundwater movement is very slow. Using the average hydraulic conductivity measured for Blackhawk Sandstone (3.0×10^{-6} cm/sec) (see Table 1) which is equal to 0.1 inch per day. Therefore, water encountered underground would take approximately 1,736 years to travel one mile. This water

is considered relatively immobile. The water encountered and used underground would not reach the Colorado Drainage in any reasonable time, if ever, and thus water consumed underground cannot negatively effect the Colorado River Basin.

Surface Dust Suppression It has been estimated that usage on the surface for dust suppression will be approximately 10,000 gallon per day or 3,650,000 gallons per year. This results in a usage of 11.20 acre feet per year.

Direct Diversions - no consumption.

Adding the four losses due to mining equals to 80.81 acre feet which is below the mitigation level of 100 acre feet. ~~UEI~~ECCR does hold 362.76 acre feet of underground water rights to offset any consumption. Therefore, it is the opinion ~~of UtahAmerican Energy, Inc.~~ECCR that water consumption by underground coal mining operation will NOT jeopardize the existence of or adversely modify the critical habitat of the Colorado River endangered fish species.

The Permittee is aware that regardless of state-appropriated water rights held by the Permittee, ay water consumption over 100 acre-feet per year is subject to a per acre-foot fee payable to the USFWS. And, that the actual water consumption reported in the annual report once mining operations have commenced, might be subject to a Section 7 consultation with the USFWS.

Conclusion

Based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for domestic, agricultural, industrial, wildlife or other legitimate purpose.

It should be noted that the determination of no known depletion of flow or quality is based on available data, which is primarily post-mining. ~~UtahAmerican Energy~~Emery County Coal Resouses, Inc. will report actual water depletion values annually in the Annual Report.

Table 2 Projected Water Usage (Quantitative Water Consumption Impact Assessment)	
1- Bath House/Office a. 150 @ 35 gpd/ea. = 5250 x 240	1,260,000 gal./yr.
2- Mining(Coal moisture loss) a. 2 Sections (1) 4.5 M Ton @ 4.5 gal./ton	20,250,000 gal./yr.
3- Fan (Evaporation from ventilation) a. Evaporation (1) 900,000 cfm @ 473,040 M cf/yr. (2) 2.5 gal./M c.f.	1,183,600gal./yr.
4. Surface Dust Suppression 10,000 gallon per day	3,650,000 gal/yr.
Total Usage	26,343,600 gal./yr. (80.81 ac.ft./yr.)

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Lila Canyon Mine

2022 Baseline Sampling of New L-18-G and L-12-A Turtle Canyon Lease Area

L-18-G Location Lat: N 39°24'39.2292" Lon: W 110°17'08.2788"

2022	1st Q	2nd Q	3rd Q	4Th Q	
Date	N/A	6-24-22	9-8-22	N/A	
Flow	N/A	>.1 GPM	Damp	N/A	
Ph	N/A	7.86	N/A	N/A	
Temperature	N/A	13.9 C	N/A	N/A	
Conductivity	N/A	1245	N/A	N/A	

*SGS results to follow

L-12-A Location Lat: N 39°24'18.6588" Lon: W 110°16'51.9888"

2022	1st Q	2nd Q	3rd Q	4Th Q	
Date	N/A	6-23-22	9-8-22	N/A	
Flow	N/A	>.1 GPM	Damp	N/A	
Ph	N/A	7.84	N/A	N/A	
Temperature	N/A	24.3	N/A	N/A	
Conductivity	N/A	1436	N/A	N/A	

*SGS results to follow

SGS

Analysis Report

July 12, 2022

EMERY COUNTY COAL RESOURCES INC
23415 NORTH LILA CANYON MINE RD
GREEN RIVER UT 84525

Client Sample ID:	L-18-G	Sample ID By:	Lila Canyon Coal Mine
Date Sampled:	Jun 24, 2022	Sample Taken At:	L-18-G
Date Received:	Jun 24, 2022	Sample Taken By:	TA
Product Description:	WATER	Time Sampled:	900
		Time Received:	1340
		Mine:	9
		Field - pH:	7.86 pH
		Field - Dis. Oxygen:	9.1 mg/L
		Field - Flow:	<0.1 GPM
		Field - Conductivity:	1245 umhos/cm
		Field - Temperature:	13.9 Deg C

Comments: Dissolved Metals Filtered at Lab

SGS Minerals Sample ID: 782-2203587-001

TESTS	RESULT	UNIT	METHOD	REPORTING LIMIT	ANALYZED DATE	TIME	ANALYST
Hardness, mg equivalent CaCO3/L	438	mg/L	SM2340-B	1	2022-07-08	14:10:56	KN
Acidity	<5	mg/L	D1067	5	2022-07-01	11:20:00	KN
Cations	13.45	meq/L	SM1030E	0	2022-07-08	14:10:56	KN
Anions	13.79	meq/L	SM1030E	0	2022-07-08	14:10:56	KN
Balance	-1.24	%	SM1030E	-10	2022-07-08	14:10:56	KN
Alkalinity, mg CaCO3/L (pH 4.5)	479	mg/L	SM2320-B	10	2022-06-29	09:39:00	RV
Bicarbonate Alkalinity as CaCO3	476	mg/L	SM2320-B	5	2022-06-29	09:39:00	RV
Carbonate Alkalinity as CaCO3	<5	mg/L	SM2320-B	5	2022-06-29	09:39:00	RV
Settleable Solids	<0.1	mL/L	SM2540-F a	0.1	2022-06-24	14:03:00	BP
Total Dissolved Solids	728	mg/L	USGS I-1750-85	30	2022-06-27	12:35:00	SA
Total Suspended Solids	16	mg/L	USGS I-3765-85	5	2022-06-27	12:50:00	SA
Chloride, Cl	13	mg/L	EPA 300.0	5	2022-07-07	16:38:00	BP
Sulfate, SO4	185	mg/L	EPA 300.0	1	2022-07-07	16:38:00	BP
Fluoride, Fl	0.14	mg/L	EPA 300.0	0.05	2022-07-07	16:38:00	BP
METALS BY ICP							
Calcium, Ca - Dissolved	53.03	mg/L	EPA 200.7	0.4	2022-06-30	15:41:00	BP
Iron, Fe - Total	0.14	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Iron, Fe - Dissolved	<0.02	mg/L	EPA 200.7	0.02	2022-06-30	15:41:00	BP

Bobbie Green
Lab Manager

SGS North America Inc. | Minerals Services Division
2035 North Airport Road Huntington UT 84528 t (435) 653-2311 f (435)-653-2436 www.sgs.com/minerals

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Analysis Report

July 12, 2022

EMERY COUNTY COAL RESOURCES INC
23415 NORTH LILA CANYON MINE RD
GREEN RIVER UT 84525

Client Sample ID:	L-18-G	Sample ID By:	Lila Canyon Coal Mine
Date Sampled:	Jun 24, 2022	Sample Taken At:	L-18-G
Date Received:	Jun 24, 2022	Sample Taken By:	TA
Product Description:	WATER	Time Sampled:	900
		Time Received:	1340
		Mine:	9
		Field - pH:	7.86 pH
		Field - Dis. Oxygen:	9.1 mg/L
		Field - Flow:	<0.1 GPM
		Field - Conductivity:	1245 umhos/cm
		Field - Temperature:	13.9 Deg C

Comments: Dissolved Metals Filtered at Lab

SGS Minerals Sample ID: 782-2203587-001

TESTS	RESULT	UNIT	METHOD	REPORTING LIMIT	ANALYZED DATE	TIME	ANALYST
METALS BY ICP (continued)							
Magnesium, Mg - Dissolved	74.23	mg/L	EPA 200.7	0.4	2022-06-30	15:41:00	BP
Manganese, Mn - Total	0.053	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Manganese, Mn - Dissolved	0.039	mg/L	EPA 200.7	0.02	2022-06-30	15:41:00	BP
Potassium, K - Dissolved	1.38	mg/L	EPA 200.7	0.5	2022-07-06	13:01:00	BP
Selenium, Se - Total	<0.02	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Sodium, Na - Dissolved	107.10	mg/L	EPA 200.7	0.4	2022-06-30	15:41:00	BP

Bobbie Green
Lab Manager

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SGS

Analysis Report

July 12, 2022

EMERY COUNTY COAL RESOURCES INC
23415 NORTH LILA CANYON MINE RD
GREEN RIVER UT 84525

Client Sample ID:	12A	Sample ID By:	Lila Canyon Coal Mine
Date Sampled:	Jun 23, 2022	Sample Taken At:	L12A
Date Received:	Jun 24, 2022	Sample Taken By:	TA
Product Description:	WATER	Time Sampled:	1334
		Time Received:	1340
		Mine:	9
		Field - pH:	7.41 pH
		Field - Dis. Oxygen:	7.3 mg/L
		Field - Flow:	<0.1 GPM
		Field - Conductivity:	1436 umhos/cm
		Field - Temperature:	24.3 Deg C

Comments: Dissolved Metals Filtered at Lab. Sample received above 6C.

SGS Minerals Sample ID: 782-2203586-001

TESTS	RESULT	UNIT	METHOD	REPORTING LIMIT	ANALYZED DATE	TIME	ANALYST
Hardness, mg equivalent CaCO3/L	611	mg/L	SM2340-B	1	2022-07-08	14:10:56	KN
Acidity	<5	mg/L	D1067	5	2022-07-01	11:20:00	KN
Cations	17.03	meq/L	SM1030E	0	2022-07-08	14:10:56	KN
Anions	17.81	meq/L	SM1030E	0	2022-07-08	14:10:56	KN
Balance	-2.25	%	SM1030E	-10	2022-07-08	14:10:56	KN
Oxygen, Dissolved	8.3	mg/L	SM 4500-O G	0.1	2022-06-24	14:33:00	SA
Alkalinity, mg CaCO3/L (pH 4.5)	491	mg/L	SM2320-B	10	2022-06-29	09:39:00	RV
Bicarbonate Alkalinity as CaCO3	491	mg/L	SM2320-B	5	2022-06-29	09:39:00	RV
Carbonate Alkalinity as CaCO3	<5	mg/L	SM2320-B	5	2022-06-29	09:39:00	RV
pH	7.84		SM4500-H	0.01	2022-06-24	14:18:00	SA
pH Temperature	21.90	°C	SM4500-H	0.01	2022-06-24	14:18:00	SA
Conductivity	1473	µmhos/cm	SM2510	0.1	2022-06-24	14:05:00	SA
Settleable Solids	<0.1	mL/L	SM2540-F a	0.1	2022-06-24	14:03:00	BP
Total Dissolved Solids	982	mg/L	USGS I-1750-85	30	2022-06-27	12:35:00	SA
Total Suspended Solids	6	mg/L	USGS I-3765-85	5	2022-06-27	12:50:00	SA
Chloride, Cl	10	mg/L	EPA 300.0	5	2022-07-07	16:38:00	BP
Sulfate, SO4	371	mg/L	EPA 300.0	1	2022-07-07	16:38:00	BP
Fluoride, Fl	0.06	mg/L	EPA 300.0	0.05	2022-07-07	16:38:00	BP

Bobbie Green
Lab Manager

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Comments: Dissolved Metals Filtered at Lab. Sample received above 6C.

SGS Minerals Sample ID: 782-2203586-001

TESTS	RESULT	UNIT	METHOD	REPORTING LIMIT	ANALYZED DATE	TIME	ANALYST
METALS BY ICP							
Calcium, Ca - Dissolved	84.51	mg/L	EPA 200.7	0.4	2022-07-06	13:01:00	BP
Iron, Fe - Total	0.35	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Iron, Fe - Dissolved	<0.02	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Magnesium, Mg - Dissolved	97.24	mg/L	EPA 200.7	0.4	2022-07-06	13:01:00	BP
Manganese, Mn - Total	0.044	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Manganese, Mn - Dissolved	<0.020	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Potassium, K - Dissolved	2.02	mg/L	EPA 200.7	0.5	2022-07-06	13:01:00	BP
Selenium, Se - Total	<0.02	mg/L	EPA 200.7	0.02	2022-07-06	13:01:00	BP
Sodium, Na - Dissolved	109.50	mg/L	EPA 200.7	0.4	2022-07-06	13:01:00	BP

Bobbie Green
Lab Manager

SGS North America Inc. | Minerals Services Division
2035 North Airport Road Huntington UT 84528 t (435) 653-2311 f (435)-653-2436 www.sgs.com/minerals

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APPENDIX 7-12

Permit Area Expansion

Hydrology

May 2022

Emery County Coal Resources

Lila Permit Area Expansion

Hydrology Information Summary

As shown on Plate 1-1, Permit Area Map, Emery County Coal Resources (ECCR) is planning to expand the existing permit boundary to allow mining in Federal Lease UTU-0126947 Tract #2 and #UtU-014218 Tract 2. This expansion will include approximately 1,256.53 acres. The current permit area is 4,664.32 acres. So, the expansion will be 26.94% of the existing permit area.

The expansion area will underlie small portions of four ephemeral washes which flow from the Book and Roan Cliffs toward Little Park Wash. The drainages affected will include IPA #1 Wash, Pine Spring Wash, Noname Wash, and Left Fork of Williams Draw. Plate 7-1 shows the location of these washes and the proposed permit expansion area outlined in blue.

SURFACE WATER

Prior hydrologic monitoring of these drainages was conducted by Kaiser Coal back in the 1980s, IPA in the 1990s, and UtahAmerican Energy (UEI) and ECCR to the present time. These efforts consisted of surface water flow monitoring and spring and seep surveys. As ECCR and UEI have reported since the early 2000's in the various precipitation and surface flow monitoring, these drainages are all ephemeral in nature and flow only in direct response to precipitation or snow melt. The channels that are found in the area consist of relatively shallow, broad mobile bed channels with a solid bedrock underlying the channel sands and loose materials.

Most of the precipitation events are short duration orographic storms which produce isolated high intensity rainfall events throughout the spring, summer, and early fall periods. The resulting runoff events tend to be very localized, short duration flow events which vary from low to very high peak flows. During times that flows in these drainages have been observed, the duration of the flow tends to be within minutes to an hour after the passage of the localized high intensity runoff events. Appendix 7-8 of the current permit presents modeling results of the response to various rainfall events and the limited duration of the flows anticipated. In several cases, the precipitation occurred upstream of the point of observation and a short period later, the channel would start flowing with a surge of debris being carried with the water flow. In several cases, high flow events either plugged and buried or destroyed the staff gauges and flow samplers which were installed in the channels.

In the late fall and through the winter, the storms tend to be frontal storms that will rain or snow for longer durations at relatively low intensity. These low intensity storms rarely produce runoff.

UEI/ECCR installed staff gauges and single stage sediment samplers to characterize the flow characteristics. These data were submitted to DOGM in reports from 2008 through 2013 which documented the flow characteristics of the flows in these various drainages. DOGM agreed that the purpose of the stream characterization had been met and the monitoring could be discontinued. Since that point, UEI/ECCR has continued to monitor the precipitation within the Little Park Drainage through the present time.

GROUNDWATER

Groundwater information for the Lila permit and proposed expansion area has also been collected since the 1980s. This consisted of geologic boring, groundwater piezometers, spring and seep surveys, and spring monitoring.

Geologic Boring - Kaiser Coal drilled a series of coal exploration holes throughout the area to characterize the area geology for both the coal beds and the overlying strata. Geologic structure from these borings shows that the coal beds and overlying strata all dip to the east-northeast at about 7 degrees into or under the Book and Roan Cliffs. These are the same conditions that are found at the Sunnyside mine located north of the Lila and Horse Canyon properties (Kaiser Coal, 1985). As discussed in the Appendix 7-11 of the current permit, due to the depth of the coal and the technology at the time, no water monitoring wells were installed due to sampling difficulties and concerns about poor water quality from standard steel casings. Unfortunately, no notations of groundwater occurrences were noted on the available logs from the time.

Groundwater Piezometers - In the 1990s, IPA installed three piezometer wells through the coal seam to be mined into the underlying strata (EarthFax, 1994). During the drilling, no significant water occurrences were encountered in the overlying strata, until the zone beneath the coal seam was encountered. Thus, it was understood that the overlying strata were not significant water bearing zones. The locations of these piezometer wells are shown on Plate 7-1. Again, due to the depth of the water in these piezometers, it was not deemed reasonable or practical to sample these for water quality. Instead, these wells were completed as piezometers to monitor the potentiometric surface of the zone below the coal seam.

Water level data from these piezometer wells were used, along with the water level in the old Horse Canyon mine, located to the north of the Lila permit area, at the rotary dump location, to prepare a potentiometric surface for the groundwater beneath the coal seam. As shown on Plate 7-1, the potentiometric surface shows that the groundwater in the coal strata flows to the northeast, following the general trend of the strata dip, into the Book and Roan Cliffs at depth and continues under Range Creek and the Uinta Basin. Given these conditions, it is very likely that the groundwater within the expansion area will follow the same trend.

Spring and Seep Surveys – In the 1980s, Kaiser Coal conducted spring and seep surveys of the permit and expansion areas (JBR, 1985). In the 1990s, IPA also conducted spring and seep surveys of the same areas (EarthFax, 1993-1995). These surveys showed springs and seeps that occurred from two general type locations. First, the alluvial fill in the bottom of the ephemeral drainages conveys remanent water from interflow resulting from rainfall runoff and snowmelt. In areas where these fills pass over bedrock ledges, either buried or exposed, the interflow waters seeps from the fill materials and flow on the surface for short distances, and then infiltrates back into the alluvial fill when it thickens downstream. Second, there are areas where the bedrock weeps or seeps groundwater at locations where sandstone or siltstone lenses overlie claystone or shale layers. The groundwater that infiltrates into the bedrock from precipitation slowly flows along the contact until it reaches an exposure to the ground surface.

In the expansion area, several seeps and springs were identified and are indicated on Plate 7-1. Most all of these are seeps with flows less than 1 gallon per minute. A few small springs were also identified with flows slightly greater than 1 gallon per minute. These springs and seeps fluctuate as to location and flow

on a seasonal basis. Depending on the annual precipitation for the area there were several areas where multiple seeps or springs were identified in a high precipitation period while in low precipitation periods, only one or no seeps or spring were located. These are depicted on Plate 7-1 as a site number with an A, B, etc. designation. Generally, the base number represents the location where the predominant site is located. Table 1 presents a representative summary of the flows and general water quality of these sites.

Table 1 – Spring and Seep Formation, Flows, and Total Dissolved Solids

Site ID	Drainage	Formation	Flow (gpm)	Total Dissolved Solids (mg/l)
10	IPA #1 Wash	Alluvium/North Horn	1	590
15	Pine Spring Wash	Colton	<1	610
16	Pine Spring Wash	Alluvium/North Horn	<1	550 – 890
18	No Name Wash	Colton	<1	650
22	Pine Spring Wash	Alluvium/North Horn	0	Dry
91-2538	IPA #1 Wash	North Horn	<1	N/A

Thus, the seep and spring surveys document the near surface groundwater occurrences are very limited in flows and are generally limited to the bottom of the washes. These data also show that the seasonal flows are directly related to the amount of annual precipitation that occurs in the upstream drainage area of each wash.

Spring Sampling – UEI/ECCR has conducted quarterly spring/seep monitoring for the Lila and Williams Draw areas. Sampling was conducted in spring, summer, and fall quarters. Winter sampling was generally not possible due to lack of access. The Lila permit area monitoring has been conducted since 2005. The William Draw area monitoring has been conducted since 2010. Appendix 7-6 of the current permit presents seep and spring information for the Lila permit area.

These quarterly sampling efforts have documented similar results as described in the seep and spring surveys. The springs and seeps are directly related to the volume of annual precipitation, and the occurrences of the spring/seeps expand during periods of greater precipitation and decrease in low precipitation periods.

Most of the alluvial springs/seeps, exhibit evidence of wildlife and stock use throughout the year, as these waters tend to be of relatively good quality water (<1,000 mg/l TDS). Several sites in the Williams Draw lease area have higher TDS values as the flows near the Little Park Wash drainage. This is likely due to the increased flow path length of water, resulting in a longer contact time with the intervening strata as well as the result of evaporation and concentration of the water as it flows along the flow path.

CONCLUSIONS

Based on the above summary, ECCR has determined that two sampling points will be added to the spring monitoring program to help monitor the near surface ground water in the expansion area. These will be the seeps 12 and 18 shown on Plate 7-1. They will be labeled as L-12A-G and L-18-G on Plate 7-4.~~it is my opinion that there are sufficient data to characterize the expansion area hydrology~~

Baseline Data Collection

ECCR is requesting approval to expand the mining into a small adjacent area of the Lila permit area (see Figure 7-1). This area is very similar to the current permit area with similar geology, surface water, and groundwater conditions. To help demonstrate this, ECCR presents the following descriptions of how the requirements of the DOGM Coal rules addressing the required Ground water, Surface Water, Geology, Climatology, and Supplemental baseline data have been collected for areas to be mined. With the expansion of the permit boundary, DOGM have requested that ECCR ensure the requirements of these rules are addressed. Therefore, with each rule, ECCR has attempted to provide brief descriptions and location references to where the requested data can be found.

724. Baseline Information. The application will include the following baseline hydrologic, geologic and climatologic information, and any additional information required by the Division.

> 724.100. Ground Water Information. The location and ownership for the permit and adjacent areas of existing wells, springs and other ground-water resources, seasonal quality and quantity of ground water, and usage. Water quality descriptions will include, at a minimum, total dissolved solids or specific conductance corrected to 25 degrees C, pH, total iron and total manganese. Ground-water quantity descriptions will include, at a minimum, approximate rates of discharge or usage and depth to the water in the coal seam, and each water-bearing stratum above and potentially impacted stratum below the coal seam.

RESPONE: The existing Lila MRP discusses the groundwater systems that exist around the mining permit area. The groundwater conditions for the Lila permit area are presented in Chapter 7 of the Lila Mining permit and Appendices 7-1, 7-2, and 7-6. Also, Cirrus Ecological Solutions (2017) conducted an Environmental Assessment for the BLM on the William Draw Coal Tract which summarized the site area and discussed the different groundwater systems that exist in the area (see pages 22 – 42).

As discussed in both sources, there are active and inactive groundwater flow regimes (Mayo et al. 2003). The active regimes are the near surface occurrences of groundwater – springs and seeps that generally flow in response to seasonal precipitation recharge. The inactive regimes are the deep aquifers the exhibit only minor or little seasonal fluctuations and minimal recharge from precipitation – groundwater elevations within the deep strata are identified by the Kaiser Well S-32 and the IPA wells 1, 2, and 3 in the sandstone located below the Sunnyside Coal seam.

For the expansion area active zone, ECCR has gathered the data from a series of sources:

- Kasier Coal Sampling efforts – 1981 – Presented in Appendix 7-X of this document
- JBR/EarthFax Spring and Seep data – Quarterly 1993-1995 – Presented in Appendices 7-1 and 7-6 of the Lila MRP
- UEI Water Monitoring program data – Quarterly 2000-present – Data presented in Appendix 7-1 of Lila MRP
- Elliot Lips Spring and Seep data – 2005 – Locations pulled from maps presented in the 2005 Board Hearings on the Lila Permit Challenge by SUWA
- UEI Spring and Seep data - Sept 2010 thru May 2018 – Quarterly samples for the Williams Draw Lease Area

Figures 7-1 and 7-1a show the spring and seep locations within the Lila Permit area and the proposed expansion area. The springs are generally located issuing from the mobile bed fill materials in the bottom of the ephemeral drainages. The seeps generally issue from bedrock areas where there is a contact between a sandstone overlying a shale. At the contact, the water collected by the sandstone lens/layer is prevented from downward migration by the underlying shale and flows along the dip or local slope to a point where the bedrock is exposed. The water subsequently discharges at the point of exposure.

In several locations there are designations of springs by number and then a number and letter. These are mostly sites that occur along the mobile bed of the bottom of the ephemeral drainage channel where the snowmelt or precipitation is carried in the mobile bed fill and rises to the surface where the underlying

strata cause the fill to thin and the water occurs at the surface. Generally, these represent a spring which was first identified at one location. On subsequent sampling efforts, the spring was found at a different location along the stream bottom – each subsequent occurrence received a separate letter designation. It is thought that the different locations are a result of either varying thicknesses of the mobile bed fill over the underlying bedrock, or variations in the volume of precipitation and snowmelt that might have occurred prior to the sampling event.

Flow and water quality data for the seeps and springs that occur in the expansion area are included in the data collected by ECCR. The 1981 data from Kaiser's sampling, the 1993 to 1995 data from the spring and seep surveys by JBR and EarthFax, the 2005 survey by Elliot Lips, the UEI S&S sampling, and the South Lease Sampling all had points within the proposed expansion area. These consisted of sample points:

Kaiser Springs	JBR/EarthFax S&S	Elliot Lips S&S	UEI S&S	South Lease S&S
	10		L-8-G	
	10A			
12	12		L-12-G	LS-001
	12A			
	12B			
	12C			
	12D			
	12E			LS-003
	15			
	15A			
	15B			
	15C			
16	16A	EL-3	L-9-G	
	16B			
	16C			
	16Z			
	17	EL-16		
	17A			
	18	EL-17		LS-002
		EL-18		
	22			

Mr. Lips was challenging the survey work that had been conducted by Kaiser, JBR, and EarthFax in prior studies. His argument was that because he found springs or seeps in locations that were not identified by the prior efforts, that the prior surveys had not adequately covered the area. As described above, this was

not the case, but a function of the different time of sampling and the varying location occurrences of flow within the channel due to the prior precipitation or snow melt recharge to the mobile bed fills within the channel areas.

Flows from all these springs and seep surveys consistently ranged from just a trickle over the bedrock surface to less than 1.5 gpm. Water quality samples were taken by Kaiser, JBR/EarthFax, and South Lease spring and seep study. These data demonstrate that the flows have been consistent over the period from 1981 through present. Also, the water quality of the waters sampled has also been consistent, though individual springs may have different water quality based on the strata source that the water occurs from.

> 724.200. Surface water information. The name, location, ownership and description of all surface-water bodies such as streams, lakes and impoundments, the location of any discharge into any surface-water body in the proposed permit and adjacent areas, and information on surface-water quality and quantity sufficient to demonstrate seasonal variation and water usage. Water quality descriptions will include, at a minimum, baseline information on total suspended solids, total dissolved solids or specific conductance corrected to 25 degrees C, pH, total iron and total manganese. Baseline acidity and alkalinity information will be provided if there is a potential for acid drainage from the proposed mining operation. Water quantity descriptions will include, at a minimum, baseline information on seasonal flow rates.

RESPONE: The existing Lila MRP discusses the surface water system that exists in the area of the mining permit area. These discussions are presented in Chapter 7 and Appendices 7-1, 7-8, and 7-10. Also, Cirrus Ecological Solutions (2017) conducted an Environmental Assessment for the BLM on the William Draw Coal Tract which summarized the lower drainages of the expansion area (see pages 42 – 49).

The expansion area is crossed by portions of four ephemeral streams. These are the IPA#1 Wash, Pine Spring Wash, Noname Wash, and the Left Fork Williams Draw. The watershed characteristics for these watersheds are presented in Appendices 7-8 and 7-10. Appendix 7-8 describes the surface water monitoring points that were established for grab samples. Unfortunately, no surface water samples have been collected due to the remoteness of the site and the lack of ability to access the site during rainstorms, as the Turtle Canyon Road is unsafe.

Additionally, UEI attempted to install a series of crest gauges and single stage samplers within the Little Park Wash drainage and its tributaries over the period of Spring 2008 through Fall 2010. These evaluations are presented in the stipulation flow and precipitation reports for 2008, 2009, and 2010 (Attached in Attachment 1).

The crest gauges were U.S.G.S. Type C, 4-foot crest gauges. These consisted of a perforated 2-inch diameter steel pipe driven into the channel bottom with a staff secured with in the pipe. Ground cork was place in the pipe so that when flow went past the gauge, the water would enter the pipe and rise to the same height as the water within the channel. When the water passed, and the water level dropped the cork would adhere to the staff. The staff was removed from the pipe and the height of the dried cork would be measured to represent the height of the water. The slopes of the channels above and below the crest gauges were used with the cross-section of the channel at the crest gauge location to determine the flow estimates, based on Manning's equation, from the crest gauge flow depth data.

The siphon samplers were standard, single-stage samplers and were located adjacent to the crest gauges. These samplers were secured to t-posts driven into the channel bottom. The sampling ports were secured to the t-post and pointed up-channel and the vents were secured to the vertical t-post.

A number of precipitation events were recorded, however the number of flow events recorded were quite limited with only a few that generated runoff. It is likely that these events were not distributed over each drainage, but were generally of limited extent, indicating that the storms were isolated thunderstorms that passed over the drainage.

These flow data likely are the result of two conditions. First, a number of the events may have occurred, but due to the shape of the channel, the mobile bed allowed the flow to be isolated to a portion of the channel that did not include the crest gauge. Second, the number of rainfall events versus the number of flow events, demonstrate that runoff events are only occurring from the short duration, high intensity precipitation events. Further, as the flows are not occurring for all stations for a given event, the rainfall is extremely isolated, and precipitation is not occurring across the entire drainage basin in the area.

For the siphon samplers, as indicated in Attachment A, only one limited volume sample was able to be collected. This is due to three conditions. First, for several sample sites, no sample was found due to a plugged sampler. Due to the flashy nature of the flows, debris carried in the flow either plugged the inlet to the sampler or diverted flow around the inlet (see sampler photos after flow events – Attachment 2). Second, the flat, broad nature of the channels allows flows within the mobile bed to shift with each event. Thus, some of the flows were isolated from the sampler portion of the channel. Third, the flow in most of these channels is very shallow and as such could not be collected by the sampler.

While the data was not of high quality, the study also demonstrated that the assertions that UEI made regarding the types of flow and the ephemeral nature of the drainages was supported. Over the two-year period, there were seven flow events that were identified. Only one partial water sample was collected, though not enough to analyze, with the rest of the storm flows either plugging the samplers with debris or the flow being diverted around the samplers.

Appendix 7-10 was prepared to address concerns raised by DOGM that there was significant drainage area, and the flows should be of significant duration that samples could be collected. The flows for these drainages were simulated by computer modeling to supports the description of the short duration type flows that occur within these drainages. Due to the high percentage of rock that is exposed in the upper portions of these drainages, the runoff events tend to be very rapid and flashy in nature. Also, as shown by the precipitation data, the storms tend to be high intensity, isolated storms. As a result, the flows have a very high peak and short duration. In some cases, the peak flow is more like a slug of water flows downstream and within a few minutes the main flow is past. For the long duration storms, the rain tends to be distributed over the day. As a result, there tends to be no or very little runoff that quickly infiltrates into the mobile bed fill.

> 724.300. Geologic Information. Each application will include geologic information in sufficient detail, as given underR645-301-624, to assist in:
>
> > 724.310. Determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary; and 724.320. Determining whether reclamation as required by the R645 Rules can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

RESPONE: Geologic conditions of the Lila Permit area are presented in Chapter 6 of the Lila Mine Permit Application and Appendices 6-1 and 6-2. As described, the coal seam being mined is the Sunnyside Seam which is located near the base of the Blackhawk Formation. Within the proposed expansion area, the seam is located under 1800 to 2500 feet of cover. The overlying strata consists of the Colton, Flagstaff/North Horn, Price River, Castlegate Sandstone, and upper portion of the Blackhawk

Formation. The proposed expansion area is located on the eastern edge of the Lila Leases and extends toward the south area of those leases. This is also immediately adjacent on the south to the William Draw Coal Tract. Cirrus Ecological Solutions (2017) conducted an Environmental Assessment for the BLM on the William Draw Coal Tract which summarized the site area and geologic stratigraphy, structural setting, major fault systems, and rock jointing (a copy of the report is attached for ease of review – see pages 11 to 21).

Structurally, these strata dip to the east – northeast at about 7 to 8 degrees. The dip takes the strata continually deeper under the Roan Cliffs, the Range Creek Drainage, and ultimately under the Uinta Basin to the north.

Surface exposures within the proposed expansion area generally consist of Colton and Flagstaff/North Horn Formations. These same conditions exist within the existing Lila Permit area. There is little difference between the areas that were studied for the Lila mining permit and the areas that are being reviewed for the permit expansion, other than the area is farther to the east, the elevation of the topography is slightly higher, and the overburden above the coal seam in greater.

724.400. Climatological Information.

724.410. When requested by the Division, the permit application will contain a statement of the climatological factors that are representative of the proposed permit area, including:
724.411. The average seasonal precipitation;
724.412. The average direction and velocity of prevailing winds; and
724.413. Seasonal temperature ranges.

724.420. The Division may request such additional data as deemed necessary to ensure compliance with the requirements of R645-301 and R645-302.

RESPONE: Climatological data for the Lila Mine are presented in Appendix 7-_. These data present the average seasonal precipitation, wind direction and wind speed, and seasonal temperature ranges.

724.500. Supplemental information. If the determination of the PHC required by R645-301-728 indicates that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies, then information supplemental to that required under R645-301-724.100 and R645-301-724.200 will be provided to evaluate such probable hydrologic consequences and to plan remedial and reclamation activities. Such supplemental information may be based upon drilling, aquifer tests, hydrogeologic analysis of the water-bearing strata, flood flows, or analysis of other water quality or quantity characteristics.

RESPONE: The PHC presented in Appendix 7-3 of the ECCR Lila Permit Application indicates that no adverse impacts to the hydrologic balance are expected, no acid-forming or toxic forming materials are present to contaminant either surface or groundwater. Therefore, no supplemental information is required to be submitted to the Division.

For the expansion area, ECCR is planning on starting mining using Continuous Miners (CM) to develop the future longwall panels. The development of the CM entries are not anticipated to have any impact on the overall groundwater systems. During this development period, ECCR will continue to collect data from the springs and seeps within and adjacent to the expansion area to add to the existing data set. Additionally, ECCR will continue to monitor the Surface water system for flow occurrences.

Attachment 1

Stipulation Precipitation and Flow Monitoring Reports - 2008 - 2010

Lila Canyon Mine

East Carbon, UTAH

Stipulation Response - Seep and Spring Inventory, Rain & Crest Gauges

Prepared For:

UtahAmerica Energy Inc.
794 C Canyon Road
East Carbon, UT 84520
435.888.4007 Tel

Prepared by:

Hydrologic Design Inc.
10969 Topview Road
South Jordan, Utah 84095
801.608.2414 Tel
801.576.9259 Fax

Contact:
Tom Suchoski

August 2008

INTRODUCTION:

On January 2, 2008 the DOGM required additional special stipulations on the prior approval of the Lila Canyon Permit. Stipulations 1 through 4 were on-going stipulation from the prior approval. Stipulations 5 through 9 were new stipulations. This report addresses the stipulations 5 (rain and crest gauges and siphon samplers) and 6 (seep and spring) .

The purpose of this study was to address these stipulations and to specifically:

- Described the installation of rain gauges within the Lila Canyon Mine Permit Area.
- Describe the installation of crest gauges and siphon samplers on selected streams.
- Describe the seep and spring inventory within the selected area and determine if the groundwater resources have been adequately characterized.

RAIN GAUGES

In accordance with stipulation #5, two rain gauges were installed within the Lila Canyon Mine Permit area. One is located to the south of the mine facilities area and one is located on top of the Book Cliffs in the Little Park Wash drainage area (near the IPA #2 well site). The locations of the rain gauges were determined by an Delorme Earthmate PN-20 GPS unit and are shown on Plate 1 and the coordinates and elevations are presented in Table 1. These rain gauges were tipping bucket type rain gauges with a data logger. The data are collected in 0.01" increments with a resolution of 0.01 inches per second. Readings are taken only when precipitation is recorded. The data are stored in the data logger memory until the data are downloaded. When the next sequence is started, the prior data are erased and overwritten.

CREST GAUGES AND SIPHON SAMPLERS

In accordance with stipulation #5, seven (7) sets of crest gauge and siphon sampler were installed on selected drainages within the Lila Canyon Mine Permit area. Crest Gauge 1 was installed on March 11, 2008 and Crest Gauges 2 - 7 were installed on August 1, 2008. The position of the sample sites were determined by either Mr. David Darby and Mr. James Smith, of the DOGM staff, in concurrence with the UEI representatives. Efforts were made to locate the sampling sites in a fairly

uniform section of channel and in a location where the upstream flows would not be affected by channel changes. This was generally possible in all locations except Crest Gauge 1 where the channel was meandering sharply. Once installed, the locations of the sampling sites were determined using an Delorme Earthmate PN-20 GPS unit. Plate 1 shows the location of these sites and Table 1 presents the coordinates and elevations.

The crest gauges were U.S.G.S. Type C, 4-foot crest gauges. These were attached to a 2-inch diameter steel pipe driven into the channel bottom.

The siphon samplers were standard, single-stage samplers and were located adjacent to the crest gauges. These samplers were secured to t-posts driven into the channel bottom. The sampling ports were secured to the t-post and pointed up-channel and the vents were secured to the vertical t-post.

SEEP AND SPRING INVENTORY

In accordance with stipulation #6, a seep and spring inventory was conducted of the area from the top of the Sunnyside coal seam of the Book Cliffs escarpment in a southwesterly direction to the Emery county Road (old tram road at 5750 foot elevation) from Lila Canyon near the proposed mine facilities to the Williams Draw Fault Line near the southern limits of the permit area. Plate 1 (attached) shows the location of the area that was covered by the seep and spring survey.

METHODS: On April 11 and 12, 2008, a spring and seep survey was conducted to address the special condition #5 as described above. The area of study was traversed on foot to determine any seep or spring locations. A team of three individuals consisting of Tom Suchoski, Josh Suchoski, and Jay Marshall walked the area at various elevations from just below the base of the coal seam, at mid slope, and along the bottom of the channel or toe of the slope. In this manner, the area was checked for any water occurrences.

Where water was identified, a GPS reading was taken to locate the site using a DeLorme Earthmate PN-20 GPS unit. An estimate of flow was determined and where sufficient water was available temperature, pH, and conductivity readings were taken. These measurements were taken with a Hanna combination meter, model HI98129.

The GPS data were exported from the DeLorme GPS units on the NAD 27 base in deg.-min. format. These values were then converted to State Plane

coordinates (feet) using the U.S. Army Corps of Engineers, CorpsCon program, version 6.0.1. The data were then plotted on the site area base map using AutoCAD.

RESULTS: Within the survey area, a series of 5 seeps were identified that were in addition to the seeps previously identified. All of these seeps were located within the Stinky Spring Canyon. Most occurrences were in close proximity to previously identified sites. It was difficult to tell whether these were separate occurrences or if they were different expressions of the same water.

Points JS-1 and JS-2 were separate occurrences. JS-1 was a wet spot high up on a cliff face and appeared to be the result of formation contact expression (i.e., sandstone layer overlying shale layer). JS-2 was located up the side canyon to Stinky Spring and was also a formation contact expression.

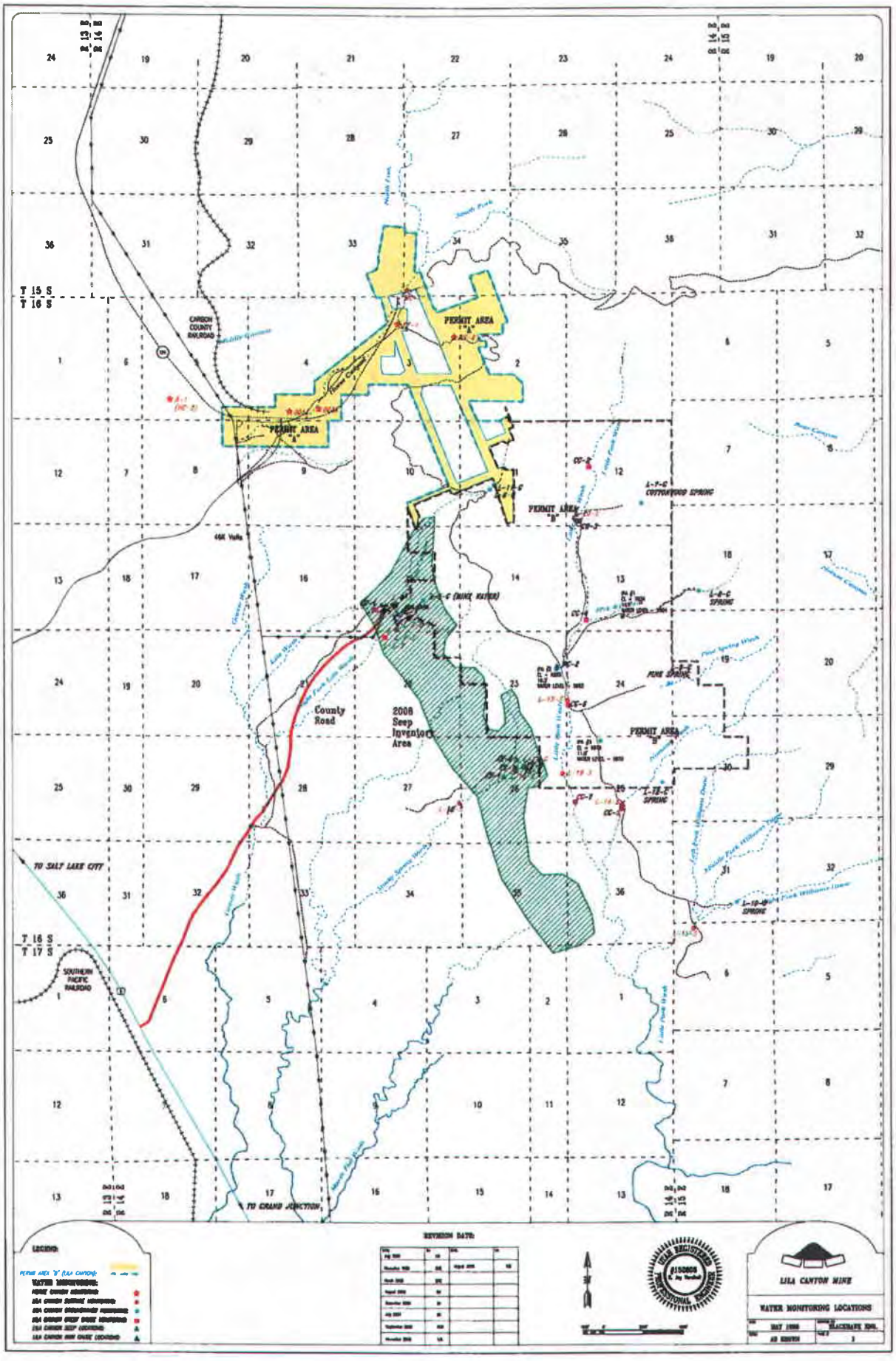
Plate 1 shows the location of the seep occurrences. Table 1 shows the coordinates and elevations of the seeps. Also, the table presents the flows and associated data.

As can be seen, the flows were extremely small and in three locations the rocks were damp with no flowing water. In the locations where flows were sufficient to collect a sample, the conductivity was greater than the meter could read and pH values were quite basic. Such water quality would not be suitable for wildlife. Few if any indications that wildlife had used these sources could be seen.

TABLE 1

Lila Canyon - Water Monitoring Coordinate Data

Site	Latitude	Longitude	Stateplane N (feet)	Stateplane E (feet)	Elevation (ft.)	# of satellites	Error margin (+/-)	Flow Rat	Cond.	Temp	pH
IPA #1	39° 25.514' N	110° 18.439' W	399946.05	2336903.63	7049	6	22				
IPA #2	39° 25.088' N	110° 19.144' W	397316.3	2333618.88	6872	6	17				
IPA #3	39° 24.488' N	110° 18.718' W	393701.03	2335672.92	6820	7	17				
L-01-S	39° 25.6457' N	110° 20.8662' W	400595.57	2325467.03	5826	8	19				
L-02-S	39° 25.5230' N	110° 20.7040' W	399860.709	2326240.081	5934	8	19				
L-07-G	39° 26.450' N	110° 18.223' W	405640.88	2337844.49	7354	5	19				
L-08-G	39° 25.717' N	110° 17.621' W	401229.84	2340737.86	7049	5	45				
L-09-G	39° 24.958' N	110° 17.952' W	396601.96	2339241.56	7036	6	18				
L-11-G	39° 26.618' N	110° 19.781' W	406563.58	2330498.28	7220	4	35				
L-12-G	39° 24.143' N	110° 18.038' W	391649.72	2338902.98	6762	6	29				
L-13-S	39° 24.831' N	110° 19.032' W	395763.35	2334166.82	6820	6	18				
L-14-S	39° 23.960' N	110° 18.472' W	390511.64	2336874	6678	8	19				
L-16-G	39° 24.2498' N	110° 19.5893' W	392201.033	2331589.099	5792	8	19				
L-17-G	39° 24.2957' N	110° 19.4968' W	392485.352	2332021.029	5896	8	19				
L-18-S	39° 23.9966' N	110° 20.1881' W	390627.335	2328789.29	5513	8	19				
L-19-S	39° 24.228' N	110° 19.094' W	392099.45	2333923.26	6700	5	18				
L-20-S	39° 26.314' N	110° 18.916' W	404771.98	2334593.76	7153	9	15				
RAIN GAUGES - APRIL 2008 & AUGUST 2008											
RG-1	39° 25.5620' N	110° 20.8216' W	400090.286	2325683.408	5946	8	19				
RG-2	39° 25.1101' N	110° 19.1383' W	397450.92	2333644.12	6875	8	19				
SPRING & SEEP - APRIL 2008											
JS-1	39° 24.2052' N	110° 19.7143' W	391922.606	2331004.009	5793	8	19	damp	-	-	-
JS-2	39° 24.3467' N	110° 19.5807' W	392789.721	2331621.879	5932	8	19	0.01	+4000	54.3	9.03
TS-1	39° 24.2667' N	110° 19.5851' W	392303.871	2331607.531	5873	8	19	0.01	+4000	40.2	8.68
TS-2	39° 24.2848' N	110° 19.5101' W	392418.37	2331959.268	6005	8	19	damp	-	-	-
TS-3	39° 24.2899' N	110° 19.5168' W	392448.911	2331927.311	5992	8	19	damp	-	-	-
CREST GAUGES - AUGUST 2008											
Lila CG1	39° 25.6006' N	110° 21.0658' W	400309.785	2324530.799	5739	8	19				
Lila CG2	39° 26.7540' N	110° 18.7754' W	407451.416	2335220.175	7303	8	19				
Lila CG3	39° 26.3110' N	110° 18.8839' W	404755.876	2334745.274	7233	8	19				
Lila CG4	39° 25.4918' N	110° 18.8207' W	399787.62	2335108.598	6968	8	19				
Lila CG5	39° 23.9398' N	110° 18.4462' W	390390.749	2336997.324	6675	8	19				
Lila CG6	39° 24.8083' N	110° 18.9742' W	395629.264	2334440.693	6809	8	19				
Lila CG7	39° 23.9969' N	110° 18.9549' W	390705.618	2334596.861	6656	8	19				


T 15 S
T 16 S
T 16 S
T 17 S
PERMIT AREA "A"
PERMIT AREA "B"
CARBON COUNTY RAILROAD
SOUTHERN PACIFIC RAILROAD
County Road
2008 Seep Inventory Area
TO SALT LAKE CITY
TO GRAND JUNCTION
L-7-C COTTONWOOD SPRING
L-8-C SPRING
L-12-C SPRING
L-10-C SPRING
FORE SPRING
LEGEND
REVISION DATES
LILA CANYON MINE
WATER MONITORING LOCATIONS

Series	Event (2008)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	3
Series Info	Information about the data in the series
Points Used	2
First Point	05/27/2008 11:25:19.19
Last Point	08/14/08 12:57:57.0
Duration	79:01:01:32:37.8
Stats	Calculated from the series
Wrap Count	0
Event Sum	0.00
Launch Parameters	Mirrors the launch dialog settings
Description	Lila RainGauge Lower
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2008
Event Value	208.00
Lockout After Event	00:00:01.0

Date/Time	Event (2008)

NO DATA - Equipment Malfunction

Series	Event (2008)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	2
Series Info	Information about the data in the series
Points Used	2
First Point	05/14/08 10:25:08.0
Last Point	05/27/08 11:22:09.5
Duration	13:00:57:58.5
Stats	Calculated from the series
Wrap Count	0
Event Sum	0.00
Launch Parameters	Mirrors the launch dialog settings
Description	Lila Raingauge Lower
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2008
Event Value	208.00
Lockout After Event	00:00:01.0

Date/Time	Event (2008)
05/14/08 10:25:08.0	0
05/27/08 11:22:09.5	0

Series	Event (2008)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	3
Series Info	Information about the data in the series
Points Used	2
First Point	8/14/2008 12:57:57
Last Point	3/20/2009 12:43:36
Duration	217:22:40:39
Stats	Calculated from the series
Wrap Count	0
Event Sum	0.00
Launch Parameters	Mirrors the launch dialog settings
Description	Lila Raingauge Lower
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2008
Event Value	208.00
Lockout After Event	00:00:01.0

Date/Time	Event (2008)
8/14/2008 12:57:57	0
3/20/2009 12:43:36	0

Series	Event (2008)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	1
Series Info	Information about the data in the series
Points Used	2
First Point	03/11/08 09:29:21.0
Last Point	05/14/08 10:20:03.0
Duration	64:00:51
Stats	Calculated from the series
Wrap Count	0
Event Sum	0.00
Launch Parameters	Mirrors the launch dialog settings
Description	Lila Raingauge Lower
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2008
Event Value	2.00
Lockout After Event	00:00:01.0

Date/Time	Event (2008)
03/11/08 09:29:21.0	0
05/14/08 10:20:03.0	0

HORIZON LABORATORIES

General Offices: P.O. Box 995 Price, UT. 84501 (435)637-8855
Laboratory: 65 North 300 East Price, UT. 84501

Report Date
10/28/2008

Client
Utah American Energy Inc.
Horse/Lila Canyon
P.O. Box 986
Price, UT 84501
Jay Marshall
(435)637-5032 Ext.724

Sample I.D.
CG #6 1
Sampled By: RJM/DD
Date: ~ 8/31/08 **Time:**
Received
Date: 10/3/2008 **Time:** 15:50

Field Measurements

Cond. uS	Temp. F	pH	D.O. ppm	Turbidity NTU
589	71.7	5.6		

Notes:
Flood Single - Stage Sample
Total Suspended Solids exceed method stated maximum range.
Sample temperature > 6°C when received.
Insufficient sample to analyze for Cl, SO4, and F.
*Expired upon receipt

Lab I.D. #: 719 Mine Code 9 Site Code

Certificate of Analysis

Analyte	Results	Units	MRL	Method	Date	Time	Analyst
Wet Chem.							
*Acidity to pH 8.3	-3778	mg/L as $CaCO_3$	NA	SM 2310 B(4a)-97	10/15/2008	12:12	SB
*Alkalinity, Bicarbonate	2968	mg/L as $CaCO_3$	10	SM2320-B-97	10/13/2008	9:29	SB
*Alkalinity, Carbonate	<10	mg/L as $CaCO_3$	10	SM2320-B-97	10/13/2008	9:29	SB
*Alkalinity, Total	2968	mg/L as $CaCO_3$	20	SM2320-B-97	10/13/2008	9:29	SB
*Solids, Total Dissolved	285	mg/L	20	SM 2540 C-97	10/9/2008	13:49	SB
*Solids, Total Suspended	40175	mg/L	4	SM 2540 D-97	10/9/2008	13:49	SB
Metals by ICP							
Calcium, Dissolved	66.70	mg/L	0.05	EPA 200.7	10/28/2008	13:43	SB
Iron, Dissolved	0.165	mg/L	0.010	EPA 200.7	10/28/2008	13:43	SB
Iron, Total	1444	mg/L	0.010	EPA 200.7	10/21/2008	17:33	SB
Magnesium, Dissolved	15.41	mg/L	0.050	EPA 200.7	10/28/2008	13:43	SB
Manganese, Dissolved	1.070	mg/L	0.001	EPA 200.7	10/28/2008	13:43	SB
Manganese, Total	59.560	mg/L	0.001	EPA 200.7	10/21/2008	17:33	SB
Potassium, Dissolved	4.45	mg/L	0.3	EPA 200.7	10/28/2008	13:43	SB
Sodium, Dissolved	12.05	mg/L	0.750	EPA 200.7	10/28/2008	13:43	SB
Calculations							
Hardness	230.01	mg/L as $CaCO_3$		SM2340-B	10/28/2008	12:31	SB
Total Cations	5.23	meq/L			10/28/2008	12:31	SB

Brandon Pierce
Technical Director

All reported results meet the requirements of NELAC, except for Balance and Hardness.
Balance and Hardness are calculated from certified results.

2008 Crest Gauges
Little Park Area

Intermittent Washes

Month	Date	CG-1	CG-2	CG-3	CG-4	CG-5	CG-6	CG-7	Initial of Observer	Entered on Data Base
January										
February										
March										
April										
May										
June										
July										
August	NF	NF	NF	NF	NF	NF	NF	NF	RJM/TS	
September										
October	NF	.5"	NF	NF	1.75"	19"	.75"	Washed Out Sampled	RJM/DD	
November										
December										

APPENDIX B

Reporting of Technical Data

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

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

CONTENTS

Lila Canyon Mine

East Carbon, UTAH

Stipulation Response - Rain & Crest Gauge Data and Evaluation

Prepared For:

UtahAmerica Energy Inc.
794 C Canyon Road
East Carbon, UT 84520
435.888.4007 Tel

Prepared by:



Hydrologic Design Inc.
4173 Dardanelle Drive
South Jordan, Utah 84095
801.608.2414 Tel
801.576.9259 Fax

Contact:
Thomas J. Suchoski

November 2009

INTRODUCTION:

On January 2, 2008 the DOGM required additional special stipulations on the prior approval of the Lila Canyon Permit. Stipulations 1 through 4 were on-going stipulations from the prior approval. Stipulations 5 through 9 were new stipulations. This report addresses the stipulation 5 (rain and crest gauges and siphon samplers) requirement to report on the data collected.

The purpose of this study was to address these stipulations and to specifically:

- Described the rain gauge data for the upper and lower areas within the Lila Canyon Mine Permit Area.
- Describe the crest gauge and siphon sampler data from the 7 selected sampling points.

RAIN GAUGES

As reported in the 2008 report, in accordance with stipulation #5, two rain gauges were installed within the Lila Canyon Mine Permit area. One is located to the south of the mine facilities area and one is located on top of the Book Cliffs in the Little Park Wash drainage area (near the IPA #2 well site). The locations of the rain gauges were determined by an Delorme Earthmate PN-20 GPS unit and are shown on Plate 1 and the coordinates and elevations are presented in Table 1.

METHODS: These rain gauges were tipping bucket type rain gauges with a data logger. The data are collected in 0.01" increments with a resolution of 0.01 inches per second. Readings are taken only when precipitation is recorded. The data are stored in the data logger memory until the data are downloaded. When the next sampling period sequence is started, the prior data are erased and overwritten. The data were downloaded during the quarterly sampling efforts.

RESULTS: Tables 1 and 2 present the rainfall data for the 4th quarter of 2008 and the three quarters of 2009 at the lower rain gauge. Table 3 and 4 present the rainfall data for the 4th quarter of 2008 and the three quarters of 2009 at the upper rain gauge.

EVALUATION: These data demonstrate the types of rainfall that is common in the mine site area. As indicated in the PAP, the rainfall was described as a combination of short duration, high intensity thunderstorms and gentle frontal storms. These are

the types of storms that were recorded in the data collected. Therefore, the precipitation regime in the mine permit area is as described in the PAP.

CREST GAUGES AND SIPHON SAMPLERS

As reported in the 2008 report, in accordance with stipulation #5, seven (7) sets of crest gauge and siphon sampler were installed on selected drainages within the Lila Canyon Mine Permit area. Plate 1 shows the location of these sites and Table 1 presents the coordinates and elevations.

METHODS: The crest gauges and siphon samplers were checked on at least a quarterly basis and sometimes more frequently as access and manpower were available.

RESULTS: Attachment A presents the flow data for the various crest gauges and the presence of water samples for the various quarters of 2008 and 2009. Table 5 presents the slopes of the channels in the area of the crest gauges and the flow estimates, based on Manning's equation, from the crest gauge flow data.

EVALUATION: As can be seen, the number of flow events recorded were quite limited with only 3 events that generated runoff. Additionally, these events were not distributed over the entire drainage, but were of limited extent. In October 2008, the data indicate that CG-2, CG-3, and CG-7 had no flows. In June 2009, only CG-1 had flow. In September 2009, no flow was recorded at CG-1, CG-2, CG-4, and CG-5.

These flow data are the result of two conditions. First, a number of the events may have occurred, but due to the shape of the channel, the mobile bed allowed the flow to be isolated to a portion of the channel that did not include the crest gauge. Second, the number of rainfall events versus the number of flow events, demonstrate that runoff events are only occurring from the short duration, high intensity precipitation events. Further, as the flows are not occurring for all stations for a given event, the rainfall is extremely isolated and precipitation is not occurring across the entire drainage basin in the mine permit area.

For the siphon samplers, as indicated in Attachment A, only one limited volume sample was able to be collected. This is due to three conditions. First, for several flow events, no sample was found due to a plugged sampler. The debris carried in the flow either plugged the inlet to the sampler or diverted flow around the inlet. Second, the flat board nature of the channels allows flows within the mobile

bed to shift with each event. Thus, some of the flows were isolated from the sampler portion of the channel. Third, the flow in most of these channels is very shallow and as such could not be collected by the sampler.

CONCLUSIONS:

The data from the rain gauges and the crest staff gauges presents the typical rainfall-runoff conditions for the mine permit area. The conditions described by these data are consistent with the descriptions presented in the PAP for the Lila Canyon Mine.

Table 1

Lila Canyon Raingauge Data

Lower Site 2008

Date	Duration	Depth (in)
9/9/2008	30 min	0.1
9/10/2009	6 hr	0.04
9/11/2009	5 hr	0.09
9/20/2009	5 hr	0.05
10/3/2009	8 min	0.03

Table 2

Lila Canyon Raingauge Data

Lower Site 2009

Date	Duration	Depth (in)
4/4/2009	1 hr	0.19
4/11/2009	2 hr	0.21
4/12/2009	2 hr	0.02
4/16/2009	1 hr	0.16
4/18/2009	20 min	0.02
4/25/2009	7 hr	0.2
4/26/2009	9 hr	0.32
5/2/2009	19 hr	0.66
5/3/2009	21 hr	0.2
5/4/2009	18 hr	0.65
5/27/2009	2 min	0.02
5/28/2009	10 min	0.05
5/29/2009	1 min	0.01
6/1/2009	1 min	0.01
6/2/2009	1 min	0.01
6/18/2009	1 min	0.01
6/20/2009	5 hr	0.15
6/21/2009	30 min	0.18
6/25/2009	2.5 hr	0.13
6/26/2009	1.5 hr	0.29
7/3/2009	1.2 hr	0.14
7/4/2009	1 hr	0.16
7/11/2009	5 min	0.01
7/20/2009	5 min	0.01
8/5/2009	12 min	0.02
8/6/2009	2 hr	0.08
8/23/2009	12 min	0.17
8/24/2009	30 min	0.05
8/29/2009	2 min	0.01
9/14/2009	10 min	0.02
9/15/2009	2 hr	1.13
10/1/2009	2 min	0.01

Table 3

Lila Canyon Raingauge Data

Upper Site 2008

Date	Duration	Depth (in)
10/4/2008	12 hr	0.65
10/20/2009	17 hr	0.07
10/29/2009	2 min	0.01
11/2/2009	6 hr	0.63
11/4/2009	8 min	0.01
11/27/2009	7 hr	0.13
11/28/2009	5 min	0.01
12/16/2009	4.5 hr	0.13
12/17/2009	5 min	0.01
12/18/2009	5 min	0.01
12/20/2009	5 min	0.01
12/21/2009	5 min	0.01
12/23/2009	5 hr	0.11
12/30/2009	3 hr	0.17
12/31/2009	10 min	0.03

Table 4

Lila Canyon Raingauge Data

Upper Site 2009

Date	Duration	Depth (In)
1/3/2009	2 min	0.01
1/19/2009	10 min	0.04
1/23/2009	5 hr	0.02
1/24/2009	8 hr	0.18
1/26/2009	1 hr	0.12
2/8/2009	30 min	0.04
2/9/2009	5 min	0.01
2/10/2009	5 min	0.01
2/13/2009	5 min	0.01
2/14/2009	1 hr	0.02
2/15/2009	10 min	0.01
2/17/2009	2 hr	0.13
2/23/2009	1 hr	0.06
3/7/2009	10 min	0.01
3/26/2009	2.5 hr	0.12
4/1/2009	30 min	0.02
4/4/2009	2.5 hr	0.32
4/11/2009	45 min	0.2
4/12/2009	4 hr	0.02
4/16/2009	1.5 hr	0.23
4/18/2009	30 min	0.04
4/25/2009	1 hr	0.09
4/26/2009	7 hr	0.38
5/2/2009	7 hr	0.48
5/20/2009	10 min	0.04
5/21/2009	5 min	0.01
5/22/2009	6 hr	0.17
5/23/2009	13 hr	0.17
5/24/2009	17 hr	0.49
5/26/2009	10 min	0.07
5/28/2009	10 min	0.03
5/29/2009	30 min	0.08
6/2/2009	5 min	0.02
6/10/2009	4 hr	0.02
6/11/2009	15 min	0.04

Table 4

Lila Canyon Raingauge Data

Upper Site 2009

Date	Duration	Depth (in)
1/3/2009	2 min	0.01
1/19/2009	10 min	0.04
1/23/2009	5 hr	0.02
1/24/2009	8 hr	0.18
1/26/2009	1 hr	0.12
2/8/2009	30 min	0.04
2/9/2009	5 min	0.01
2/10/2009	5 min	0.01
2/13/2009	5 min	0.01
2/14/2009	1 hr	0.02
2/15/2009	10 min	0.01
2/17/2009	2 hr	0.13
2/23/2009	1 hr	0.06
3/7/2009	10 min	0.01
3/26/2009	2.5 hr	0.12
4/1/2009	30 min	0.02
4/4/2009	2.5 hr	0.32
4/11/2009	45 min	0.2
4/12/2009	4 hr	0.02
4/16/2009	1.5 hr	0.23
4/18/2009	30 min	0.04
4/25/2009	1 hr	0.09
4/26/2009	7 hr	0.38
5/2/2009	7 hr	0.48
5/20/2009	10 min	0.04
5/21/2009	5 min	0.01
5/22/2009	6 hr	0.17
5/23/2009	13 hr	0.17
5/24/2009	17 hr	0.49
5/26/2009	10 min	0.07
5/28/2009	10 min	0.03
5/29/2009	30 min	0.08
6/2/2009	5 min	0.02
6/10/2009	4 hr	0.02
6/11/2009	15 min	0.04

Table 5

Lila Canyon Crest Gauge Data

Channel Slope Determination

Stage ID	Channel Length (ft)	Channel Drop (ft)	Channel Slope (%)
CG-1	1020	50	4.90
CG-2	2055	50	2.43
CG-3	2510	50	1.99
CG-4	2965	50	1.69
CG-5	3180	50	1.57
CG-6	2430	50	2.06
CG-7	4650	100	2.15

Flow Determination

	Depth (in)	Width (ft)	Channel Slope (%)	Manning's n	Velocity (fps)	Flow (cfs)
Oct-08						
CG-1	0.5	2	4.90	0.035	1.13	0.09
CG-4	1.75	6	1.69	0.03	1.78	1.56
CG-5	19	13	1.57	0.03	8.43	173.57
CG-6	0.75	4	2.06	0.03	1.12	0.28
Jun-09						
CG-1	5	8	4.9	0.035	5.24	17.47
Sep-09						
CG-3	4	10	1.99	0.03	3.36	11.19
CG-6	6	15	2.06	0.03	4.48	33.58
CG-7	6	20	2.15	0.03	4.57	45.74

ATTACHMENT A

Crest Gauge and Siphon Data

2008 Crest Gauges
Little Park Area

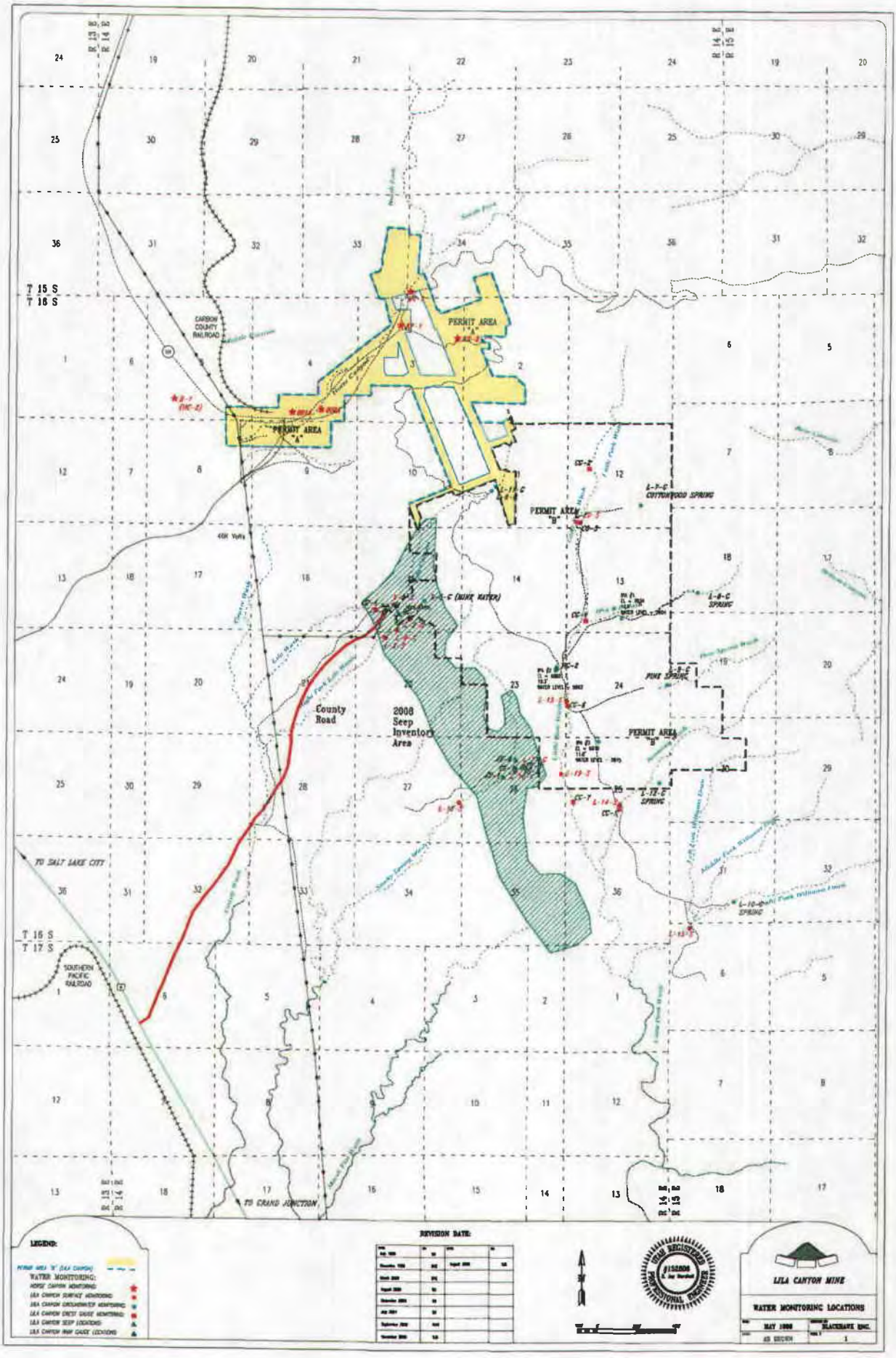
Intermittent Washes

Month	Date	CG-1	CG-2	CG-3	CG-4	CG-5	CG-6	CG-7	Initial of Observer	Entered on Data Base
January										
February										
March										
April										
May										
June										
July										
August	NF	NF	NF	NF	NF	NF	NF	NF	RJM/TS	
September										
October	NF	.5"	NF	NF	1.75"	19"	.75"	Washed Out Sampled	RJM/DD	
November										
December										

2009 Crest Gauges
Little Park Area

Intermittent Washes

Month	Date	CG-1	CG-2	CG-3	CG-4	CG-5	CG-6	CG-7	Initial of Observer	Entered on Data Base
January										
February										
March	3/19/09	NF	NA	NA	NA	NA	NA	NA	RJM	
April										
May										
June	6/2/09 6/18/09	5" deep 8'Wide no sample	NF	NF	NF	NF	NF	NF	RJM	
July										
August										
September	9/3/09 9/15/09 9/21/09	NF	NF	4" deep 10' wide no sample	NF	NF	6" deep 15' wide no sample	6" deep 20' wide Sampled	RJM	
October										
November										
December										


T 15 S
T 16 S
T 16 S
T 17 S
PERMIT AREA "A"
PERMIT AREA "B"
CARBON COUNTY RAILROAD
SOUTHERN PACIFIC RAILROAD
TO SALT LAKE CITY
TO GRAND JUNCTION
County Road
2008 Seep Inventory Area
L-7-C COTTONWOOD SPRING
L-8-C SPRING
L-12-C SPRING
L-10-C (Middle Fork Williams Fork) SPRING
L-9-C (MINE WATER)
PINE SPRING
LEGEND:
WATER MONITORING:
REVISION DATE:
LILA CANYON MINE
WATER MONITORING LOCATIONS
MAY 1998
BLACKHAWK ENG.

Lila Canyon Mine

East Carbon, UTAH

Rain & Crest Gauge Data Evaluation and Recommendations

Prepared For:

UtahAmerica Energy Inc.
794 C Canyon Road
East Carbon, UT 84520
435.888.4007 Tel

Prepared by:

Hydrologic Design Inc.
4173 Dardanelle Drive
South Jordan, Utah 84095
801.608.2414 Tel
801.576.9259 Fax

Contact:
Thomas J. Suchoski

December 2010

INTRODUCTION:

On January 2, 2008 the DOGM required additional special stipulations on the prior approval of the Lila Canyon Permit. Stipulations 1 through 4 were on-going stipulations from the prior approval. Stipulations 5 through 9 were new stipulations. This report addresses the stipulation 5 (rain and crest gauges and siphon samplers) requirement to report on the data collected.

The purpose of this study was to address the stipulation and to specifically:

- Described the rain gauge data collection for the upper and lower areas within the Lila Canyon Mine Permit Area.
- Describe the crest gauge and siphon sampler data collection from the 7 selected sampling points.
- Evaluate data and recommend future sampling activities.

Stipulation #5 required the following:

"(a) UEI shall, within 30 days (weather permitting and pickup accessibility permitting) of the approval by the Board of the Stipulation for Dismissal, locate and make operable two rain gauges within the permit area, including one in the upper elevation area, and one in the surface facilities area. Data will be collected no less than monthly during the period from May 1 through October 30 and otherwise monthly unless access is not feasible. Data will be downloaded quarterly and included in the annual report.

(b) UEI will by March 31, 2008 (weather and pickup accessibility permitting) place and make operable crest stage gauges and siphon samplers at the sampling locations shown on the attached map# 1. UEI will collect two years of additional quarterly surface water quantity and quality baseline information from the gauges. The gauges will be installed, maintained, and inspected as required by normal USGS protocol and on a frequency established by the Division. The Division will accompany UEI on the initial placement of the siphon and crest stage gauges.

(c) At the conclusion of the first year, the data will be analyzed, and additional monitoring locations may be required."

In response to this stipulation, UEI installed the rain gauges and siphon and crest gauges as requested.

RAIN GAUGES

As reported in the 2008 and 2009 reports, in accordance with stipulation #5, two rain gauges were installed within the Lila Canyon Mine Permit area. The lower elevation gauge is located to the south of the mine facilities area and the upper elevation gauge is located on top of the Book Cliffs in the Little Park Wash drainage area (near the IPA #2 well site). The locations of the rain gauges were determined by an Delorme Earthmate PN-20 GPS unit and are shown on Plate 1 and the coordinates and elevations are presented in Table 1.

METHODS: These rain gauges are tipping bucket type rain gauges with a data logger. The data are collected in 0.01" increments with a resolution of 0.01 inches per second. Readings are taken only when precipitation is recorded. The data are stored in the data logger memory until the data are downloaded. When the next sampling period sequence is started, the prior data are erased and overwritten. The data were downloaded during the quarterly sampling efforts.

Attempts are made to tie the sampling periods to the corresponding quarters; however, due to difficulties in accessing the upper sites, these periods are sometimes longer than a normal 3-month quarter. The summary tables adjust these data to the various quarters or years as appropriate.

RESULTS: Tables 2 and 3 present the rainfall data for the 4th period of 2009 and three periods of 2010 at the lower rain gauge, respectively. Table 4 and 5 present the rainfall data for the 4th period of 2009 and three periods of 2010 at the upper rain gauge, respectively. Attachment A presents the period data for the upper and lower rain gauge stations.

EVALUATION: These data, plus the data from the 2008 and 2009 reports, demonstrate the types of rainfall that are common in the mine site area. There are three types of precipitation events recorded: short duration small isolated storms, short duration, high intensity storms, and longer frontal type storms.

As indicated in the PAP, the rainfall types occurring in the area was described as a combination of short duration, high intensity thunderstorms and gentle frontal storms. These are the same types of storms that were recorded in the data collected. The only difference was the identification of short duration small isolated storms. These storms were generally less than 0.1 inches in depth and less than 10 minutes in duration. Therefore, the precipitation regime occurring in the mine permit area is now documented and matches that described in the PAP.

CREST GAUGES AND SIPHON SAMPLERS

As reported in the 2008 and 2009 reports, in accordance with stipulation #5, seven (7) sets of crest gauge and siphon samplers were installed at various points in the drainage areas within the Lila Canyon Mine Permit area. Plate 1 shows the location of these sites and Table 1 presents the coordinates and elevations.

METHODS: The crest gauges and siphon samplers were checked on at least a quarterly basis and sometimes more frequently as access and manpower were available.

The crest gauges were U.S.G.S. Type C, 4-foot crest gauges. These were attached to a 2-inch diameter steel pipe driven into the channel bottom.

The siphon samplers were standard, single-stage samplers and were located adjacent to the crest gauges. These samplers were secured to t-posts driven into the channel bottom. The sampling ports were secured to the t-post and pointed up-channel and the vents were secured to the vertical t-post.

RESULTS: Attachment B presents the flow data for the various crest gauges and the presence of water samples for the various periods of 2009 and 2010. Table 6 presents the slopes of the channels in the area of the crest gauges and the flow estimates, based on Manning's equation, from the crest gauge flow data.

EVALUATION: As can be seen, the number of flow events recorded were quite limited with only 2 events that generated runoff. Additionally, these events were not distributed over the entire drainage, but were of limited extent. In October 2009, the data indicate that CG-2, CG-3, CG-4, and CG-6 had no flows. In September 2010, only CG-5 and CG-7 had flow.

For the siphon samplers, as indicated in Attachment B, only one limited volume sample was able to be collected. The flow in October 2009 at CG-1 was sufficient to collect about 1/3 bottle (insufficient for analysis).

These flow data are the result of several conditions:

- First, a number of the events may have occurred, but due to the channel conditions such as the debris carried in the flow or type of the channel a flow reading or sample was not collected. For several flow events, no sample was found due to plugged gauges or samplers. The debris carried in the flow either plugged the inlet to the gauge or sampler or diverted flow around the inlet. Also, the flat, broad nature of

the channels allows flows within the mobile bed to shift with each event. Thus, some of the flows may have occurred in portions of the channel which were isolated from the gauge or sampler.

- Second, comparing the number of rainfall events versus the number of flow events and looking at the rainfall record prior to the times that runoff is recorded, demonstrate that runoff events are only occurring from the short duration, high intensity precipitation events. Further, as the rainfall can be extremely isolated and precipitation is not occurring across the entire drainage basin in the mine permit area, the flows are not occurring for all stations for a given event.
- Third, the flow in most of these channels is very shallow and as such could not be collected or recorded by the gauge/sampler.

CONCLUSIONS AND RECOMMENDATIONS:

Stipulation #5 was prepared in response to the Southern Utah Wilderness Alliance comments that the PAP did not adequately characterize the hydrologic conditions of the site area. UEI disagreed with this comment and presented information to the Division and Board of Oil, Gas, and Mining regarding this issue. Further, UEI presented information that the quality of the data collected from this type of monitoring was questionable and did not yield any better description of the hydrologic regime than was already known.

As part of a settlement agreement which allowed mining to proceed, UEI agreed to accept the stipulation to collect two years of precipitation and water flow and quality data to demonstrate the points raised in the presentations.

The data presented in the 2008, 2009, and 2010 summaries demonstrate that the data from the rain gauges and the crest staff gauges presents the typical rainfall-runoff conditions for the mine permit area. The conditions described by these data are consistent with the descriptions presented in the PAP for the Lila Canyon Mine.

As these data are consistent with the PAP description, the purpose of Stipulation #5 has been accomplished and the justification for additional monitoring is no longer justified. It is recommended that the rainfall monitoring for the upper rain gauge and the crest gauge and siphon samplers for the Little Park Wash area be discontinued and the equipment be saved for future monitoring on new mine areas, if needed.

TABLE 1

Lila Canyon - Water Monitoring Coordinate Data

Site	Latitude	Longitude	Stateplane N (feet)	Stateplane E (feet)	Elevation (ft.)	# of satellites	Error margin (+/-)	Flow Rat	Cond.	Temp	pH
IPA #1	39° 25.514' N	110° 18.439' W	399946.05	2336903.63	7049	6	22				
IPA #2	39° 25.088' N	110° 19.144' W	397316.3	2333618.88	6872	6	17				
IPA #3	39° 24.488' N	110° 18.718' W	393701.03	2335672.92	6820	7	17				
L-01-S	39° 25.6457' N	110° 20.8662' W	400595.57	2325467.03	5826	8	19				
L-02-S	39° 25.5230' N	110° 20.7040' W	399860.709	2326240.081	5934	8	19				
L-07-G	39° 26.450' N	110° 18.223' W	405640.88	2337844.49	7354	5	19				
L-08-G	39° 25.717' N	110° 17.621' W	401229.84	2340737.86	7049	5	45				
L-09-G	39° 24.958' N	110° 17.952' W	396601.96	2339241.56	7036	6	18				
L-11-G	39° 26.618' N	110° 19.781' W	406563.58	2330498.28	7220	4	35				
L-12-G	39° 24.143' N	110° 18.038' W	391649.72	2338902.98	6762	6	29				
L-13-S	39° 24.831' N	110° 19.032' W	395763.35	2334166.82	6820	6	18				
L-14-S	39° 23.960' N	110° 18.472' W	390511.64	2336874	6678	8	19				
L-16-G	39° 24.2498' N	110° 19.5893' W	392201.033	2331589.099	5792	8	19				
L-17-G	39° 24.2957' N	110° 19.4968' W	392485.352	2332021.029	5896	8	19				
L-18-S	39° 23.9966' N	110° 20.1881' W	390627.335	2328789.29	5513	8	19				
L-19-S	39° 24.228' N	110° 19.094' W	392099.45	2333923.26	6700	5	18				
L-20-S	39° 26.314' N	110° 18.916' W	404771.98	2334593.76	7153	9	15				
RAIN GAUGES - APRIL 2008 & AUGUST 2008											
RG-1	39° 25.5620' N	110° 20.8216' W	400090.286	2325683.408	5946	8	19				
RG-2	39° 25.1101' N	110° 19.1383' W	397450.92	2333644.12	6875	8	19				
SPRING & SEEP - APRIL 2008											
JS-1	39° 24.2052' N	110° 19.7143' W	391922.606	2331004.009	5793	8	19	damp	-	-	-
JS-2	39° 24.3467' N	110° 19.5807' W	392789.721	2331621.879	5932	8	19	0.01	+4000	54.3	9.03
TS-1	39° 24.2667' N	110° 19.5851' W	392303.871	2331607.531	5873	8	19	0.01	+4000	40.2	8.68
TS-2	39° 24.2848' N	110° 19.5101' W	392418.37	2331959.268	6005	8	19	damp	-	-	-
TS-3	39° 24.2899' N	110° 19.5168' W	392448.911	2331927.311	5992	8	19	damp	-	-	-
CREST GAUGES - AUGUST 2008											
Lila CG1	39° 25.6006' N	110° 21.0658' W	400309.785	2324530.799	5739	8	19				
Lila CG2	39° 26.7540' N	110° 18.7754' W	407451.416	2335220.175	7303	8	19				
Lila CG3	39° 26.3110' N	110° 18.8839' W	404755.876	2334745.274	7233	8	19				
Lila CG4	39° 25.4918' N	110° 18.8207' W	399787.62	2335108.598	6968	8	19				
Lila CG5	39° 23.9398' N	110° 18.4462' W	390390.749	2336997.324	6675	8	19				
Lila CG6	39° 24.8083' N	110° 18.9742' W	395629.264	2334440.693	6809	8	19				
Lila CG7	39° 23.9969' N	110° 18.9549' W	390705.618	2334596.861	6656	8	19				

Table 2

Lila Canyon Raingauge Data

Lower Site 2009

Date	Duration	Depth (in)
10/22/2009	10 min	0.04
10/23/2009	45 min	0.19
10/26/2009	86 min	0.07
11/12/2009	36 min	0.28
11/15/2009	92 min	0.46
11/22/2009	14 min	0.05
12/17/2009	7 min	0.02

Table 3

Lila Canyon Raingauge Data

Lower Site 2010

Date	Duration	Depth (in)
1/1/2010	13 Min	0.03
1/31/2010	3 Min	0.02
3/13/2010	16 Min	0.04
3/21/2010	15 Min	0.01
3/23/2010	5 Min	0.02
4/21/2010	9 Hrs	0.25
4/22/2010	7 Hrs	0.03
4/29/2010	13 Min	0.01
5/12/2010	2 Hrs	0.15
5/14/2010	25 Min	0.07
5/15/2010	6 Min	0.02
5/18/2010	8 Min	0.03
5/25/2010	4 Min	0.02
6/2/2010	73 Min	0.22
6/15/2010	7 Min	0.07
6/25/2010	28 Min	0.03
7/24/2010	3.25 Hrs	0.11
7/27/2010	5 Hrs	0.14
7/28/2010	7.5 Hrs	0.03
8/14/2010	77 Min	0.1
8/15/2010	32 Min	0.05
8/17/2010	25 Min	0.07
8/18/2010	6 Min	0.02
8/20/2010	8 Min	0.03
8/29/2010	11 Hrs	0.03
9/22/2010	5.5 Hrs	0.1
10/3/2010	45 Min	0.01
10/4/2010	39 Min	0.06
10/5/2010	20.75 Hrs	0.45
10/6/2010	24 Hrs	1.28
10/7/2010	15 Min	0.04
10/17/2010	11 Min	0.02
10/18/2010	13 Hrs	0.14
10/21/2010	2 Hrs	0.02
10/22/2010	8.5 Hrs	0.09
10/23/2010	9 Hrs	0.05
10/24/2010	38 Min	0.01
10/25/2010	6 Hrs	0.18
10/30/2010	1.5 Hrs	0.09

Table 3

Lila Canyon Raingauge Data

Lower Site 2010

Date	Duration	Depth (in)
11/8/2010	6 Hrs	0.17
11/9/2010	4 Min	0.02

Table 4

Lila Canyon Raingauge Data

Upper Site 2009

Date	Duration	Depth (in)
10/22/2009	35 Min	0.04
10/23/2009	45 Min	0.19
10/26/2009	86 Min	0.07
11/12/2009	73 Min	0.34
11/15/2009	108 Min	0.55
11/22/2009	14 Min	0.09
12/17/2009	13 Min	0.05

Table 5

Lila Canyon Raingauge Data

Upper Site 2010

Date	Duration	Depth (in)
1/1/2010	13 Min	0.05
1/16/2010	6 Min	0.03
1/31/2010	9 Min	0.03
2/15/2010	69 Min	0.03
3/13/2010	16 Min	0.04
3/21/2010	15 Min	0.01
4/21/2010	6 Hrs	0.15
4/22/2010	5.5 Hrs	0.02
4/29/2010	11 Min	0.01
5/12/2010	100 Min	0.11
5/14/2010	20 Min	0.05
5/15/2010	8 Min	0.02
5/18/2010	13 Min	0.03
5/25/2010	5 Min	0.02
6/2/2010	73 Min	0.22
6/15/2010	7 Min	0.05
7/24/2010	5 Hrs	0.09
7/27/2010	3 Hrs	0.11
7/28/2010	2.5 Hrs	0.03
8/14/2010	75 Min	0.08
8/15/2010	49 Min	0.05
8/17/2010	34 Min	0.06
8/18/2010	11 Min	0.02
8/20/2010	20 Min	0.03
8/29/2010	17 Min	0.03
9/22/2010	77 Min	0.08
9/25/2010	3.5 Hrs	0.02
10/4/2010	50 Min	0.07
10/5/2010	17 Hrs	0.39
10/6/2010	24 Hrs	1.29
10/7/2010	18 Hrs	0.08
10/18/2010	15 Hrs	0.16
10/22/2010	10.5 Hrs	0.1
10/23/2010	36 Min	0.04
10/25/2010	80 Min	0.16
10/30/2010	90 Min	0.1
11/8/2010	2.5 Hrs	0.16

Table 6

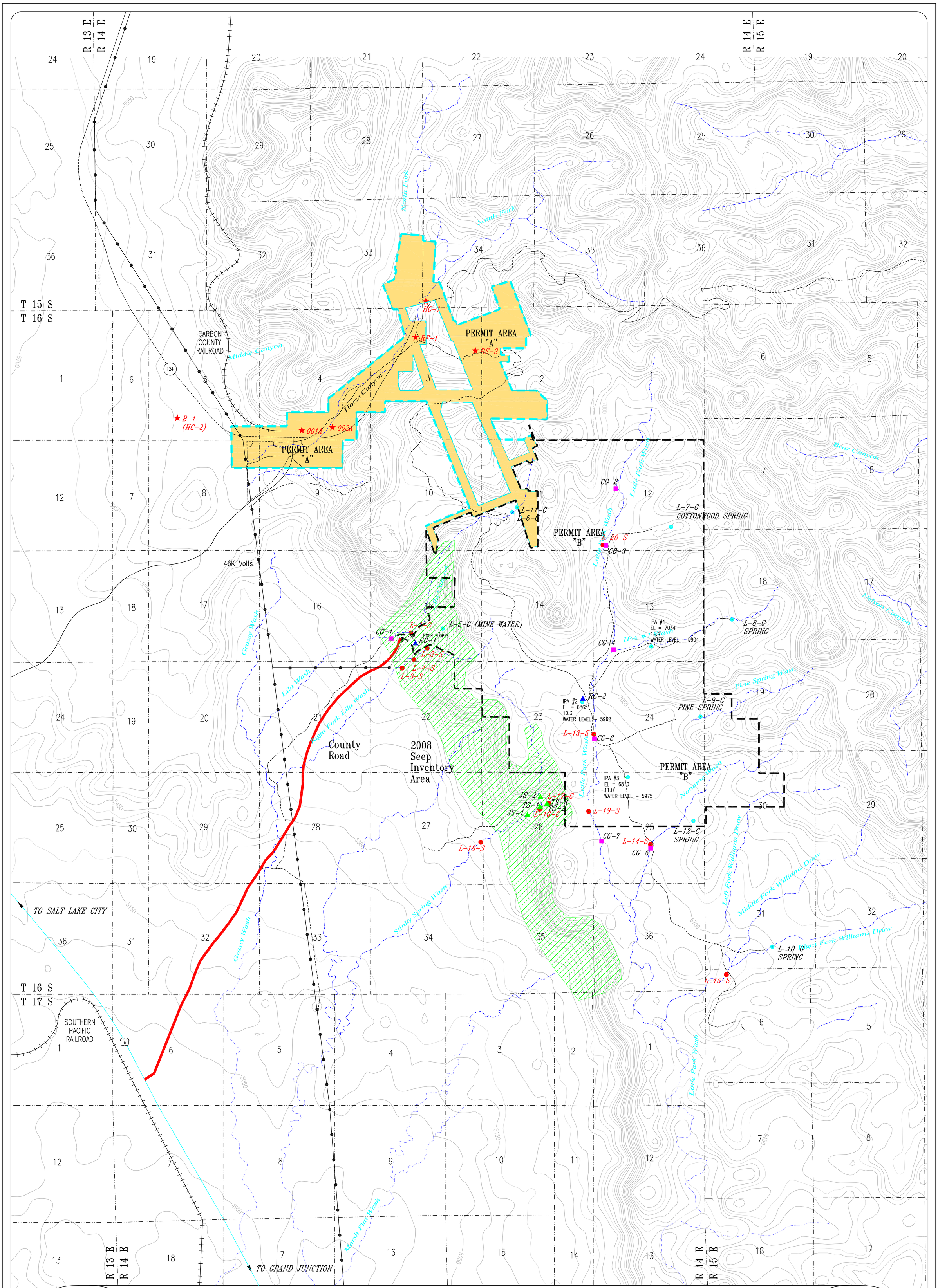
Lila Canyon Crest Gauge Data

Channel Slope Determination

Stage ID	Channel Length (ft)	Channel Drop (ft)	Channel Slope (%)
CG-1	1020	50	4.90
CG-2	2055	50	2.43
CG-3	2510	50	1.99
CG-4	2965	50	1.69
CG-5	3180	50	1.57
CG-6	2430	50	2.06
CG-7	4650	100	2.15

Flow Determinations

	Depth (in)	Width (ft)	Channel Slope (%)	Manning's n	Velocity (fps)	Flow (cfs)
Oct-09						
CG-1	8	9	4.90	0.035	7.17	43.04
CG-2*	0	0	2.43	0.03	0	0.00
CG-3*	0	0	1.99	0.03	0	0.00
CG-4*	0	0	1.69	0.03	0	0.00
CG-5	4	11	1.57	0.03	2.98	10.94
CG-6*	0	0	2.06	0.03	0	0.00
CG-7	11	15	2.15	0.03	6.85	94.24
* sampling intakes plugged with debris or sampler destroyed						
Apr-10						
CG-1	0	0	4.90	0.035	0	0.00
CG-2	0	0	2.43	0.03	0	0.00
CG-3	0	0	1.99	0.03	0	0.00
CG-4	0	0	1.69	0.03	0	0.00
CG-5	0	0	1.57	0.03	0	0.00
CG-6	0	0	2.06	0.03	0	0.00
CG-7	0	0	2.15	0.03	0	0.00
Jun-10						
CG-1	0	0	4.90	0.035	0	0.00
CG-2	0	0	2.43	0.03	0	0.00
CG-3	0	0	1.99	0.03	0	0.00
CG-4	0	0	1.69	0.03	0	0.00
CG-5	0	0	1.57	0.03	0	0.00
CG-6	0	0	2.06	0.03	0	0.00
CG-7	0	0	2.15	0.03	0	0.00
Aug-10						
CG-1	0	0	4.90	0.035	0	0.00
CG-2	0	0	2.43	0.03	0	0.00
CG-3	0	0	1.99	0.03	0	0.00
CG-4	0	0	1.69	0.03	0	0.00
CG-5	1	4	1.57	0.03	1.18	0.39
CG-6	0	0	2.06	0.03	0	0.00
CG-7	0.5	6	2.15	0.03	0.87	0.22



LEGEND:

PERMIT AREA "A" (HORSE CANYON):
PERMIT AREA "B" (LILA CANYON):

WATER MONITORING:

- HORSE CANYON MONITORING:
- LILA CANYON SURFACE MONITORING:
- LILA CANYON GROUNDWATER MONITORING:
- LILA CANYON CREST GAUGE MONITORING:
- LILA CANYON SEEP LOCATIONS:
- LILA CANYON RAIN GAUGE LOCATIONS:

REVISION DATE:

DATE:	BY:	DATE:	BY:
July 1999	WJ		
November 1999	BHE	August 2008	TJS
March 2000	BHE		
August 2000	BJ		
December 2000	BJ		
July 2001	BJ		
September 2002	RJM		
November 2006	TJS		

1000' 0' 2000' 4000'

UTAH REGISTERED #152606 R. Jay Marshall PROFESSIONAL ENGINEER

LILA CANYON MINE

WATER MONITORING LOCATIONS

DATE:	DESIGNED BY:
MAY 1998	BLACKHAWK ENG.
SCALE: AS SHOWN	PLATE #: 1

ATTACHMENT A

Quarterly Data Summary for Upper and Lower Rain Gauges

Lower Gauge Data

Series	Event (2009)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	15
Series Info	Information about the data in the series
Points Used	122
First Point	10/01/09 10:16:39.5
Last Point	03/23/10 09:42:24.5
Duration	172 days 23:25:45.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	122.00
Launch Parameters	Mirrors the launch dialog settings
Description	lila lower 1st qt 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2009
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2009)		Depth	Hours:Mins
10/01/09 10:16:39.5		0	Likely bumped gauge closing up	
10/01/09 10:18:13.5		1	0.01	0:01
10/22/09 15:31:07.5		2		
10/22/09 15:32:31.0		3		
10/22/09 15:39:51.5		4		
10/22/09 15:41:22.0		5	0.04	0:10
10/23/09 14:28:11.0		6		
10/23/09 14:30:40.0		7		
10/23/09 14:48:37.0		8		
10/23/09 14:49:45.5		9		
10/23/09 14:54:57.0		10		
10/23/09 14:55:58.0		11		
10/23/09 14:56:39.5		12		
10/23/09 14:56:54.5		13		
10/23/09 14:57:22.0		14		
10/23/09 14:57:35.5		15		

10/23/09 14:57:58.0	16		
10/23/09 14:58:10.0	17		
10/23/09 14:58:32.5	18		
10/23/09 14:58:45.0	19		
10/23/09 14:59:06.5	20		
10/23/09 14:59:27.0	21		
10/23/09 15:02:01.0	22		
10/23/09 15:03:54.5	23		
10/23/09 15:13:31.5	24	0.19	0:45
10/26/09 14:15:20.5	25		
10/26/09 14:20:15.0	26		
10/26/09 14:23:13.5	27		
10/26/09 14:33:29.0	28		
10/26/09 15:05:35.5	29		
10/26/09 15:21:13.0	30		
10/26/09 15:41:52.0	31	0.07	1:26
11/12/09 12:26:14.0	32		
11/12/09 12:28:03.5	33		
11/12/09 12:35:21.0	34		
11/12/09 12:35:56.0	35		
11/12/09 12:36:48.5	36		
11/12/09 12:37:23.0	37		
11/12/09 12:38:25.0	38		
11/12/09 12:39:02.0	39		
11/12/09 12:40:39.0	40		
11/12/09 12:41:48.0	41		
11/12/09 12:43:51.5	42		
11/12/09 12:44:38.5	43		
11/12/09 12:45:14.5	44		
11/12/09 12:45:33.0	45		
11/12/09 12:45:54.5	46		
11/12/09 12:46:11.5	47		
11/12/09 12:46:37.0	48		
11/12/09 12:46:53.5	49		
11/12/09 12:47:18.0	50		
11/12/09 12:47:31.5	51		
11/12/09 12:47:49.5	52		
11/12/09 12:48:01.5	53		
11/12/09 12:48:24.0	54		
11/12/09 12:48:38.0	55		
11/12/09 12:49:04.0	56		
11/12/09 12:49:20.5	57		
11/12/09 12:52:44.5	58		
11/12/09 13:03:08.0	59	0.28	0:36

11/15/09 14:50:36.0	60
11/15/09 14:51:32.0	61
11/15/09 14:52:19.5	62
11/15/09 14:52:52.5	63
11/15/09 14:53:20.5	64
11/15/09 14:53:27.5	65
11/15/09 14:53:41.5	66
11/15/09 14:53:50.5	67
11/15/09 14:54:05.5	68
11/15/09 14:54:12.5	69
11/15/09 14:54:25.0	70
11/15/09 14:54:46.5	71
11/15/09 14:54:58.5	72
11/15/09 14:55:11.0	73
11/15/09 14:55:19.0	74
11/15/09 14:55:30.5	75
11/15/09 14:55:39.5	76
11/15/09 14:55:54.5	77
11/15/09 14:56:07.0	78
11/15/09 14:56:25.0	79
11/15/09 14:56:36.5	80
11/15/09 14:56:57.0	81
11/15/09 14:57:13.5	82
11/15/09 14:57:41.5	83
11/15/09 14:58:00.5	84
11/15/09 14:58:31.0	85
11/15/09 14:58:51.0	86
11/15/09 14:59:09.5	87
11/15/09 14:59:21.5	88
11/15/09 14:59:39.5	89
11/15/09 14:59:52.5	90
11/15/09 15:00:14.5	91
11/15/09 15:00:46.0	92
11/15/09 15:00:59.5	93
11/15/09 15:01:34.5	94
11/15/09 15:01:59.0	95
11/15/09 15:02:39.0	96
11/15/09 15:02:56.0	97
11/15/09 15:03:41.5	98
11/15/09 15:04:08.0	99
11/15/09 15:07:55.5	100
11/15/09 15:18:23.0	101
11/15/09 15:39:45.0	102
11/15/09 15:45:40.0	103

11/15/09 16:07:29.0	104		
11/15/09 16:23:21.5	105	0.46	1:32
11/22/09 18:10:18.0	106		
11/22/09 18:12:22.0	107		
11/22/09 18:14:54.0	108		
11/22/09 18:18:48.5	109		
11/22/09 18:24:19.0	110	0.05	0:14
12/17/09 14:30:31.5	111		
12/17/09 14:38:08.0	112	0.02	0:07
01/01/10 17:28:08.0	113		
01/01/10 17:35:09.5	114		
01/01/10 17:42:01.0	115	0.03	0:13
01/31/10 12:50:35.5	116		
01/31/10 12:54:09.0	117	0.02	0:03
03/13/10 01:21:45.0	118		
03/13/10 01:24:43.0	119		
03/13/10 01:34:26.5	120		
03/13/10 01:38:17.0	121	0.04	0:16
03/21/10 17:21:06.0	122	0.01	0:15

Series	Event (2010)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	16
Series Info	Information about the data in the series
Points Used	92
First Point	03/23/10 09:47:42.0
Last Point	06/25/10 11:46:40.0
Duration	94 Days 01:58:58.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	92.00
Launch Parameters	Mirrors the launch dialog settings
Description	lila lower 2nd qtr 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2010
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2010)	Depth		Hours:Mins
03/23/10 09:47:42.0	0			
03/23/10 12:50:26.0	1			
03/23/10 12:55:58.5	2	0.02	0:05	
04/21/10 13:51:22.0	3			
04/21/10 13:52:32.5	4			
04/21/10 14:03:32.5	5			
04/21/10 15:45:48.5	6			
04/21/10 15:46:32.5	7			
04/21/10 15:47:56.5	8			
04/21/10 15:49:09.0	9			
04/21/10 15:52:26.5	10			
04/21/10 15:57:58.5	11			
04/21/10 16:58:02.5	12			
04/21/10 17:06:45.0	13			
04/21/10 18:07:46.0	14			
04/21/10 18:14:23.0	15			
04/21/10 18:15:32.0	16			

04/21/10 18:17:03.0	17		
04/21/10 18:18:22.5	18		
04/21/10 18:19:56.0	19		
04/21/10 18:21:32.5	20		
04/21/10 18:24:29.0	21		
04/21/10 19:43:38.5	22		
04/21/10 19:47:43.5	23		
04/21/10 19:53:07.5	24		
04/21/10 20:11:32.5	25		
04/21/10 20:27:29.5	26		
04/21/10 23:05:14.0	27	0.25	9:13
04/22/10 01:27:13.5	28		
04/22/10 03:12:56.0	29		
04/22/10 08:52:10.0	30	0.03	7:24
04/29/10 02:26:07.5	31	0.01	0:13
05/12/10 17:11:25.5	32		
05/12/10 17:37:37.0	33		
05/12/10 17:55:42.0	34		
05/12/10 18:00:54.5	35		
05/12/10 18:05:07.5	36		
05/12/10 18:09:02.0	37		
05/12/10 18:16:14.5	38		
05/12/10 18:18:03.0	39		
05/12/10 18:22:34.5	40		
05/12/10 18:28:28.5	41		
05/12/10 18:34:51.5	42		
05/12/10 18:40:19.0	43		
05/12/10 18:48:41.5	44		
05/12/10 18:55:17.5	45		
05/12/10 19:07:10.5	46	0.15	1:55
05/14/10 09:57:40.5	47		
05/14/10 10:02:43.0	48		
05/14/10 10:05:24.5	49		
05/14/10 10:09:29.5	50		
05/14/10 10:12:24.0	51		
05/14/10 10:16:28.0	52		
05/14/10 10:22:58.0	53	0.07	0:25
05/15/10 14:40:31.0	54		
05/15/10 14:46:56.0	55	0.02	0:06
05/18/10 15:00:08.0	56		
05/18/10 15:04:12.5	57		
05/18/10 15:08:42.5	58	0.03	0:08
05/25/10 15:28:41.0	59		
05/25/10 15:32:56.0	60	0.02	0:04
06/02/10 14:22:41.0	61		

06/02/10 14:22:51.0	62		
06/02/10 14:23:29.5	63		
06/02/10 14:23:54.0	64		
06/02/10 14:24:19.0	65		
06/02/10 14:24:34.5	66		
06/02/10 14:25:11.5	67		
06/02/10 14:27:01.0	68		
06/02/10 14:27:12.5	69		
06/02/10 14:27:14.0	70		
06/02/10 14:27:15.5	71		
06/02/10 14:27:17.0	72		
06/02/10 14:27:18.5	73		
06/02/10 14:27:40.5	74		
06/02/10 14:27:48.0	75		
06/02/10 14:27:49.5	76		
06/02/10 14:27:52.0	77		
06/02/10 14:27:53.5	78		
06/02/10 14:28:01.5	79		
06/02/10 14:28:19.0	80		
06/02/10 14:28:54.0	81		
06/02/10 15:35:40.5	82	0.22	1:13
06/15/10 13:02:45.5	83		
06/15/10 13:04:15.5	84		
06/15/10 13:04:31.5	85		
06/15/10 13:04:53.5	86		
06/15/10 13:09:49.0	87		
06/15/10 13:10:02.5	88		
06/15/10 13:10:08.5	89	0.07	0:07
06/25/10 11:17:49.5	90		
06/25/10 11:46:23.5	91		
06/25/10 11:46:40.0	92	0.03	0:28

Series	Event (2010)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	17
Series Info	Information about the data in the series
Points Used	55
First Point	06/25/10 11:53:07.0
Last Point	08/26/10 12:04:44.0
Duration	62 days 00:11:37.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	55.00
Launch Parameters	Mirrors the launch dialog settings
Description	lila lower 3rd qtr 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2010
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2010)	Depth	Hours:Mins
06/25/10 11:53:07.0	0		
07/24/10 15:56:47.0	1		
07/24/10 15:57:57.5	2		
07/24/10 16:08:57.5	3		
07/24/10 17:51:13.5	4		
07/24/10 17:51:57.5	5		
07/24/10 17:53:21.5	6		
07/24/10 17:54:34.0	7		
07/24/10 17:57:51.5	8		
07/24/10 18:03:23.5	9		
07/24/10 19:03:27.5	10		
07/24/10 19:12:10.0	11	0.11	3:15
07/27/10 15:28:13.0	12		
07/27/10 15:34:50.0	13		
07/27/10 15:35:59.0	14		
07/27/10 15:37:30.0	15		
07/27/10 15:38:49.5	16		

07/27/10 15:40:23.0	17		
07/27/10 15:41:59.5	18		
07/27/10 15:44:56.0	19		
07/27/10 17:04:05.5	20		
07/27/10 17:08:10.5	21		
07/27/10 17:13:34.5	22		
07/27/10 17:31:59.5	23		
07/27/10 17:47:56.5	24		
07/27/10 20:25:41.0	25	0.14	4:57
07/28/10 13:32:38.5	26		
07/28/10 15:18:21.0	27		
07/28/10 20:57:35.0	28	0.03	7:24
08/14/10 14:16:50.5	29		
08/14/10 14:43:02.0	30		
08/14/10 15:01:07.0	31		
08/14/10 15:06:19.5	32		
08/14/10 15:10:32.5	33		
08/14/10 15:14:27.0	34		
08/14/10 15:21:39.5	35		
08/14/10 15:23:28.0	36		
08/14/10 15:27:59.5	37		
08/14/10 15:33:53.5	38	0.1	1:17
08/15/10 16:40:16.5	39		
08/15/10 16:45:44.0	40		
08/15/10 16:54:06.5	41		
08/15/10 17:00:42.5	42		
08/15/10 17:12:35.5	43	0.05	0:32
08/17/10 11:03:05.5	44		
08/17/10 11:08:08.0	45		
08/17/10 11:10:49.5	46		
08/17/10 11:14:54.5	47		
08/17/10 11:17:49.0	48		
08/17/10 11:21:53.0	49		
08/17/10 11:28:23.0	50	0.07	0:25
08/18/10 16:45:56.0	51		
08/18/10 16:52:21.0	52	0.02	0:06
08/20/10 14:12:36.0	53		
08/20/10 14:16:40.5	54		
08/20/10 14:21:10.5	55	0.03	0:08

Series	Event (2010)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	19
Series Info	Information about the data in the series
Points Used	276
First Point	08/26/10 12:10:44.0
Last Point	11/09/10 16:09:10.0
Duration	75 Days 04:58:26.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	276
Launch Parameters	Mirrors the launch dialog settings
Description	lila lower 4th qtr 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2010
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2010)	Depth		Hours:Mins
08/26/10 12:10:44.0		0		
08/29/10 09:47:02.0		1		
08/29/10 21:02:05.0		2		
08/29/10 21:04:24.0		3	0.03	11:17
09/22/10 13:32:02.5		4		
09/22/10 13:33:35.0		5		
09/22/10 13:35:15.5		6		
09/22/10 13:37:31.0		7		
09/22/10 14:19:04.5		8		
09/22/10 14:26:34.0		9		
09/22/10 14:56:29.0		10		
09/22/10 15:04:55.5		11		
09/22/10 15:14:08.0		12		
09/22/10 19:01:44.0		13	0.1	5:29
10/03/10 23:35:43.5		14	0.01	0:43
10/04/10 18:47:31.5		15		
10/04/10 18:47:51.5		16		

10/04/10 18:48:07.0	17		
10/04/10 18:49:01.5	18		
10/04/10 18:50:45.0	19		
10/04/10 19:26:32.0	20	0.06	0:39
10/05/10 03:11:56.0	21		
10/05/10 03:12:50.5	22		
10/05/10 03:13:16.5	23		
10/05/10 03:14:14.5	24		
10/05/10 03:48:01.0	25		
10/05/10 04:06:04.5	26		
10/05/10 04:10:06.0	27		
10/05/10 04:22:13.5	28		
10/05/10 04:28:33.5	29		
10/05/10 04:46:44.5	30		
10/05/10 05:21:01.0	31		
10/05/10 05:37:43.0	32		
10/05/10 05:54:35.0	33		
10/05/10 06:42:01.5	34		
10/05/10 14:28:11.5	35		
10/05/10 14:36:22.0	36		
10/05/10 14:39:30.5	37		
10/05/10 14:41:34.5	38		
10/05/10 14:42:48.0	39		
10/05/10 14:44:14.5	40		
10/05/10 14:45:06.5	41		
10/05/10 14:46:13.5	42		
10/05/10 14:46:56.0	43		
10/05/10 14:47:49.0	44		
10/05/10 14:48:24.5	45		
10/05/10 14:49:46.0	46		
10/05/10 14:51:55.0	47		
10/05/10 14:54:00.0	48		
10/05/10 14:55:18.0	49		
10/05/10 16:26:04.0	50		
10/05/10 16:29:51.5	51		
10/05/10 16:33:01.0	52		
10/05/10 16:34:37.0	53		
10/05/10 16:36:16.0	54		
10/05/10 16:37:11.5	55		
10/05/10 16:38:48.5	56		
10/05/10 16:42:25.5	57		
10/05/10 16:55:44.0	58		
10/05/10 20:27:25.5	59		
10/05/10 23:10:00.5	60		
10/05/10 23:17:30.0	61		

10/05/10 23:25:13.5	62		
10/05/10 23:46:57.0	63		
10/05/10 23:53:19.0	64		
10/05/10 23:57:16.5	65	0.45	20:45
10/06/10 00:04:59.5	66		
10/06/10 00:10:27.0	67		
10/06/10 00:14:11.0	68		
10/06/10 00:21:13.0	69		
10/06/10 01:16:56.5	70		
10/06/10 01:20:41.5	71		
10/06/10 01:36:01.5	72		
10/06/10 03:37:20.5	73		
10/06/10 03:44:28.0	74		
10/06/10 03:51:31.0	75		
10/06/10 03:52:25.0	76		
10/06/10 03:52:57.5	77		
10/06/10 03:53:47.5	78		
10/06/10 03:54:25.0	79		
10/06/10 03:55:20.5	80		
10/06/10 03:56:16.5	81		
10/06/10 03:58:11.5	82		
10/06/10 04:01:16.0	83		
10/06/10 04:06:35.0	84		
10/06/10 04:10:18.0	85		
10/06/10 04:14:27.0	86		
10/06/10 04:17:39.5	87		
10/06/10 04:26:17.5	88		
10/06/10 04:39:41.0	89		
10/06/10 04:51:16.0	90		
10/06/10 05:00:59.0	91		
10/06/10 05:08:22.0	92		
10/06/10 05:42:39.0	93		
10/06/10 05:47:59.0	94		
10/06/10 05:50:34.5	95		
10/06/10 05:54:17.5	96		
10/06/10 05:56:51.5	97		
10/06/10 05:59:37.0	98		
10/06/10 06:02:12.0	99		
10/06/10 06:05:55.0	100		
10/06/10 06:08:07.0	101		
10/06/10 06:13:30.5	102		
10/06/10 06:26:58.0	103		
10/06/10 11:05:15.5	104		
10/06/10 11:13:56.0	105		
10/06/10 11:19:17.0	106		

10/06/10 11:24:19.0	107
10/06/10 15:14:57.0	108
10/06/10 15:15:20.0	109
10/06/10 15:15:45.0	110
10/06/10 15:16:02.0	111
10/06/10 15:16:19.0	112
10/06/10 15:16:27.5	113
10/06/10 15:16:35.0	114
10/06/10 15:16:38.0	115
10/06/10 15:17:06.0	116
10/06/10 15:17:59.5	117
10/06/10 15:18:30.5	118
10/06/10 15:18:43.5	119
10/06/10 15:19:29.0	120
10/06/10 15:19:32.5	121
10/06/10 15:20:01.0	122
10/06/10 15:20:39.0	123
10/06/10 15:21:07.0	124
10/06/10 15:21:43.5	125
10/06/10 15:22:15.0	126
10/06/10 15:22:54.5	127
10/06/10 15:23:26.0	128
10/06/10 15:24:05.0	129
10/06/10 15:24:38.5	130
10/06/10 15:25:23.0	131
10/06/10 15:26:04.0	132
10/06/10 15:27:10.0	133
10/06/10 15:28:04.0	134
10/06/10 15:29:15.0	135
10/06/10 15:30:20.5	136
10/06/10 15:31:32.0	137
10/06/10 15:32:25.5	138
10/06/10 15:33:55.5	139
10/06/10 15:35:25.0	140
10/06/10 15:37:29.0	141
10/06/10 15:39:31.0	142
10/06/10 15:40:53.0	143
10/06/10 15:41:45.0	144
10/06/10 15:43:12.5	145
10/06/10 15:44:47.0	146
10/06/10 15:47:08.0	147
10/06/10 15:48:57.0	148
10/06/10 15:51:04.5	149
10/06/10 15:53:00.5	150
10/06/10 15:55:01.0	151

10/06/10 15:57:03.5	152		
10/06/10 15:58:50.5	153		
10/06/10 16:00:22.0	154		
10/06/10 16:01:52.0	155		
10/06/10 16:03:01.0	156		
10/06/10 16:04:24.0	157		
10/06/10 16:05:30.0	158		
10/06/10 16:07:05.0	159		
10/06/10 16:08:29.5	160		
10/06/10 16:10:06.5	161		
10/06/10 16:11:33.5	162		
10/06/10 16:14:06.0	163		
10/06/10 16:15:46.0	164		
10/06/10 16:17:42.0	165		
10/06/10 16:19:59.0	166		
10/06/10 16:22:25.5	167		
10/06/10 16:24:12.0	168		
10/06/10 16:26:05.0	169		
10/06/10 16:27:06.5	170		
10/06/10 16:28:16.0	171		
10/06/10 16:29:16.0	172		
10/06/10 16:30:21.5	173		
10/06/10 16:31:18.0	174		
10/06/10 16:32:53.0	175		
10/06/10 16:34:19.0	176		
10/06/10 16:35:50.0	177		
10/06/10 16:37:31.5	178		
10/06/10 16:40:17.5	179		
10/06/10 16:42:26.0	180		
10/06/10 16:44:49.5	181		
10/06/10 16:53:06.5	182		
10/06/10 16:58:21.5	183		
10/06/10 17:03:27.0	184		
10/06/10 17:10:48.5	185		
10/06/10 21:08:48.0	186		
10/06/10 22:42:30.5	187		
10/06/10 22:46:27.5	188		
10/06/10 23:33:45.5	189		
10/06/10 23:34:08.5	190		
10/06/10 23:34:35.0	191		
10/06/10 23:35:12.0	192		
10/06/10 23:37:25.5	193	1.28	23:32
10/07/10 18:20:49.0	194		
10/07/10 18:25:09.5	195		
10/07/10 18:27:50.0	196		

10/07/10 18:36:46.5	197	0.04	0:15
10/17/10 23:10:31.5	198		
10/17/10 23:22:05.0	199	0.02	0:11
10/18/10 01:17:23.0	200		
10/18/10 01:34:28.0	201		
10/18/10 04:52:51.0	202		
10/18/10 05:13:07.5	203		
10/18/10 05:17:10.0	204		
10/18/10 05:25:06.0	205		
10/18/10 05:51:10.5	206		
10/18/10 06:37:25.0	207		
10/18/10 07:13:43.5	208		
10/18/10 08:01:48.5	209		
10/18/10 08:14:22.5	210		
10/18/10 09:00:17.5	211		
10/18/10 13:57:21.0	212		
10/18/10 14:16:29.0	213	0.14	12:59
10/21/10 19:27:21.0	214		
10/21/10 21:20:04.5	215	0.02	1:52
10/22/10 07:24:00.0	216		
10/22/10 08:14:32.5	217		
10/22/10 11:35:15.5	218		
10/22/10 12:28:00.0	219		
10/22/10 14:26:42.0	220		
10/22/10 15:11:27.5	221		
10/22/10 15:29:34.0	222		
10/22/10 15:41:51.0	223		
10/22/10 15:55:37.0	224	0.09	8:31
10/23/10 08:31:57.5	225		
10/23/10 17:25:40.0	226		
10/23/10 17:26:59.5	227		
10/23/10 17:27:48.0	228		
10/23/10 17:31:55.5	229	0.05	8:59
10/24/10 18:09:56.5	230	0.01	0:38
10/25/10 00:47:45.0	231		
10/25/10 05:12:14.5	232		
10/25/10 05:13:48.0	233		
10/25/10 05:15:46.0	234		
10/25/10 05:21:15.5	235		
10/25/10 05:27:13.0	236		
10/25/10 05:32:46.5	237		
10/25/10 05:35:00.0	238		
10/25/10 05:37:38.0	239		
10/25/10 05:39:57.5	240		
10/25/10 05:42:54.5	241		

10/25/10 05:45:09.0	242		
10/25/10 05:48:25.5	243		
10/25/10 05:52:07.0	244		
10/25/10 06:01:55.5	245		
10/25/10 06:17:47.5	246		
10/25/10 06:32:45.0	247		
10/25/10 06:56:58.0	248	0.18	6:09
10/30/10 18:00:41.0	249		
10/30/10 18:10:13.0	250		
10/30/10 18:13:55.5	251		
10/30/10 18:23:55.5	252		
10/30/10 18:28:44.5	253		
10/30/10 18:33:46.5	254		
10/30/10 18:46:47.5	255		
10/30/10 19:08:10.0	256		
10/30/10 19:30:29.5	257	0.09	1:29
11/08/10 16:03:48.0	258		
11/08/10 16:14:14.0	259		
11/08/10 16:23:08.5	260		
11/08/10 16:30:31.0	261		
11/08/10 16:30:52.0	262		
11/08/10 16:31:33.5	263		
11/08/10 16:32:06.0	264		
11/08/10 16:32:39.0	265		
11/08/10 16:33:16.5	266		
11/08/10 16:36:44.0	267		
11/08/10 17:43:38.5	268		
11/08/10 17:55:40.0	269		
11/08/10 17:58:30.0	270		
11/08/10 18:04:26.0	271		
11/08/10 18:11:17.5	272		
11/08/10 18:41:58.0	273		
11/08/10 22:13:35.0	274	0.17	6:09
11/09/10 16:05:06.0	275		
11/09/10 16:09:10.0	276	0.02	0:04

Upper Gauge Data

Series	Event (2009)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	6
Series Info	Information about the data in the series
Points Used	153
First Point	10/01/09 11:55:50.5
Last Point	04/20/10 10:21:35.5
Duration	200 days 22:25:45.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	153.00
Launch Parameters	Mirrors the launch dialog settings
Description	lila upper 1st qt 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2009
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2009)	Depth	Hours:Mins
10/01/09 11:55:50.5	0	Likely bumped gauge closing up	
10/01/09 11:57:24.5	1	0.01	0:01
10/22/09 17:10:18.5	2		
10/22/09 17:11:42.0	3		
10/22/09 17:29:02.5	4		
10/22/09 17:45:33.0	5	0.04	0:35
10/23/09 16:07:22.0	6		
10/23/09 16:09:51.0	7		
10/23/09 16:27:48.0	8		
10/23/09 16:28:56.5	9		
10/23/09 16:34:08.0	10		
10/23/09 16:35:09.0	11		
10/23/09 16:35:50.5	12		
10/23/09 16:36:05.5	13		
10/23/09 16:36:33.0	14		
10/23/09 16:36:46.5	15		
10/23/09 16:37:09.0	16		

10/23/09 16:37:21.0	17		
10/23/09 16:37:43.5	18		
10/23/09 16:37:56.0	19		
10/23/09 16:38:17.5	20		
10/23/09 16:38:38.0	21		
10/23/09 16:41:12.0	22		
10/23/09 16:43:05.5	23		
10/23/09 16:52:42.5	24	0.19	0:45
10/26/09 15:54:31.5	25		
10/26/09 15:59:26.0	26		
10/26/09 16:02:24.5	27		
10/26/09 16:12:40.0	28		
10/26/09 16:44:46.5	29		
10/26/09 17:00:24.0	30		
10/26/09 17:21:03.0	31	0.07	1:26
11/12/09 13:18:25.0	32		
11/12/09 13:37:14.5	33		
11/12/09 14:14:32.0	34		
11/12/09 14:15:07.0	35		
11/12/09 14:15:59.5	36		
11/12/09 14:16:34.0	37		
11/12/09 14:17:36.0	38		
11/12/09 14:18:13.0	39		
11/12/09 14:19:50.0	40		
11/12/09 14:20:59.0	41		
11/12/09 14:23:02.5	42		
11/12/09 14:23:49.5	43		
11/12/09 14:24:25.5	44		
11/12/09 14:24:44.0	45		
11/12/09 14:25:05.5	46		
11/12/09 14:25:22.5	47		
11/12/09 14:25:48.0	48		
11/12/09 14:26:04.5	49		
11/12/09 14:26:29.0	50		
11/12/09 14:26:42.5	51		
11/12/09 14:27:00.5	52		
11/12/09 14:27:12.5	53		
11/12/09 14:27:35.0	54		
11/12/09 14:27:49.0	55		
11/12/09 14:28:15.0	56		
11/12/09 14:28:31.5	57		
11/12/09 14:28:55.5	58		
11/12/09 14:29:19.0	59		
11/12/09 14:29:47.0	60		
11/12/09 14:30:07.0	61		

11/12/09 14:30:43.0	62		
11/12/09 14:31:03.5	63		
11/12/09 14:31:30.5	64		
11/12/09 14:31:48.0	65	0.34	1:13
11/15/09 15:02:03.5	66		
11/15/09 15:15:19.0	67		
11/15/09 15:32:31.5	68		
11/15/09 16:02:38.5	69		
11/15/09 16:15:46.5	70		
11/15/09 16:32:52.5	71		
11/15/09 16:33:01.5	72		
11/15/09 16:33:07.5	73		
11/15/09 16:33:16.5	74		
11/15/09 16:33:23.5	75		
11/15/09 16:33:36.0	76		
11/15/09 16:33:44.5	77		
11/15/09 16:33:57.5	78		
11/15/09 16:34:09.5	79		
11/15/09 16:34:22.0	80		
11/15/09 16:34:30.0	81		
11/15/09 16:34:41.5	82		
11/15/09 16:34:50.5	83		
11/15/09 16:35:05.5	84		
11/15/09 16:35:18.0	85		
11/15/09 16:35:36.0	86		
11/15/09 16:35:47.5	87		
11/15/09 16:36:08.0	88		
11/15/09 16:36:24.5	89		
11/15/09 16:36:52.5	90		
11/15/09 16:37:11.5	91		
11/15/09 16:37:42.0	92		
11/15/09 16:38:02.0	93		
11/15/09 16:38:20.5	94		
11/15/09 16:38:32.5	95		
11/15/09 16:38:50.5	96		
11/15/09 16:39:03.5	97		
11/15/09 16:39:25.5	98		
11/15/09 16:39:39.0	99		
11/15/09 16:39:57.0	100		
11/15/09 16:40:10.5	101		
11/15/09 16:40:30.0	102		
11/15/09 16:40:45.5	103		
11/15/09 16:41:10.0	104		
11/15/09 16:41:30.5	105		
11/15/09 16:41:50.0	106		

11/15/09 16:42:07.0	107		
11/15/09 16:42:29.5	108		
11/15/09 16:42:52.5	109		
11/15/09 16:43:19.0	110		
11/15/09 16:43:38.5	111		
11/15/09 16:44:06.5	112		
11/15/09 16:44:34.0	113		
11/15/09 16:45:23.0	114		
11/15/09 16:45:56.0	115		
11/15/09 16:46:51.0	116		
11/15/09 16:47:34.0	117		
11/15/09 16:48:40.0	118		
11/15/09 16:49:32.5	119		
11/15/09 16:50:49.0	120	0.55	1:48
11/22/09 19:49:29.0	121		
11/22/09 19:50:32.5	122		
11/22/09 19:51:33.0	123		
11/22/09 19:52:48.5	124		
11/22/09 19:54:05.0	125		
11/22/09 19:55:47.5	126		
11/22/09 19:57:59.5	127		
11/22/09 20:00:51.5	128		
11/22/09 20:03:30.0	129	0.09	0:14
12/17/09 16:07:19.0	130		
12/17/09 16:09:42.5	131		
12/17/09 16:14:20.5	132		
12/17/09 16:17:19.0	133		
12/17/09 16:21:12.0	134	0.05	0:13
01/01/10 19:07:19.0	135		
01/01/10 19:09:42.5	136		
01/01/10 19:14:20.5	137		
01/01/10 19:17:19.0	138		
01/01/10 19:21:12.0	139	0.05	0:13
01/16/10 20:14:20.5	140		
01/16/10 20:17:19.0	141		
01/16/10 20:21:12.0	142	0.03	0:06
01/31/10 14:23:27.0	143		
01/31/10 14:29:46.5	144		
01/31/10 14:33:20.0	145	0.03	0:09
02/15/10 15:28:27.0	146		
02/15/10 15:34:46.5	147		
02/15/10 16:38:20.0	148	0.03	1:09
03/13/10 03:00:56.0	149		
03/13/10 03:03:54.0	150		
03/13/10 03:13:37.5	151		

03/13/10 03:17:28.0	152	0.04	0:16
03/21/10 19:00:17.0	153	0.01	0:15

Series	Event (2010)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	16
Series Info	Information about the data in the series
Points Used	69
First Point	04/20/10 10:27:42.0
Last Point	06/25/10 13:51:40.0
Duration	66 days 03:23:58.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	69.00
Launch Parameters	Mirrors the launch dialog settings
Description	lila upper 2nd qtr 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2010
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2010)	Depth	Hours:Mins
04/20/10 10:27:42.0	0		
04/21/10 17:06:45.0	1		
04/21/10 18:07:46.0	2		
04/21/10 18:14:23.0	3		
04/21/10 18:15:32.0	4		
04/21/10 18:17:03.0	5		
04/21/10 18:18:22.5	6		
04/21/10 18:19:56.0	7		
04/21/10 18:21:32.5	8		
04/21/10 18:24:29.0	9		
04/21/10 19:43:38.5	10		
04/21/10 19:47:43.5	11		
04/21/10 19:53:07.5	12		
04/21/10 20:11:32.5	13		
04/21/10 20:27:29.5	14		
04/21/10 23:05:14.0	15	0.15	5:58
04/22/10 03:55:56.0	16		

04/22/10 09:35:10.0	17	0.02	5:39
04/29/10 02:26:07.5	18	0.01	0:11
05/12/10 17:11:25.5	19		
05/12/10 17:37:37.0	20		
05/12/10 17:55:42.0	21		
05/12/10 18:00:54.5	22		
05/12/10 18:05:07.5	23		
05/12/10 18:16:14.5	24		
05/12/10 18:22:34.5	25		
05/12/10 18:28:28.5	26		
05/12/10 18:40:19.0	27		
05/12/10 18:48:41.5	28		
05/12/10 18:51:17.5	29		
05/12/10 18:53:10.5	30	0.11	1:41
05/14/10 10:57:40.5	31		
05/14/10 11:05:24.5	32		
05/14/10 11:12:24.0	33		
05/14/10 11:13:28.0	34		
05/14/10 11:17:58.0	35	0.05	0:20
05/15/10 15:42:31.0	36		
05/15/10 15:50:56.0	37	0.02	0:08
05/18/10 16:00:08.0	38		
05/18/10 16:08:12.5	39		
05/18/10 16:13:42.5	40	0.03	0:13
05/25/10 16:28:41.0	41		
05/25/10 16:41:56.0	42	0.02	0:05
06/02/10 15:35:41.0	43		
06/02/10 15:35:51.0	44		
06/02/10 15:36:29.5	45		
06/02/10 15:36:54.0	46		
06/02/10 15:37:19.0	47		
06/02/10 15:37:34.5	48		
06/02/10 15:38:11.5	49		
06/02/10 15:40:01.0	50		
06/02/10 15:40:12.5	51		
06/02/10 15:40:14.0	52		
06/02/10 15:40:15.5	53		
06/02/10 15:40:17.0	54		
06/02/10 15:40:18.5	55		
06/02/10 15:40:40.5	56		
06/02/10 15:40:48.0	57		
06/02/10 15:40:49.5	58		
06/02/10 15:40:52.0	59		
06/02/10 15:40:53.5	60		
06/02/10 15:41:01.5	61		

06/02/10 15:41:19.0	62		
06/02/10 15:41:54.0	63		
06/02/10 16:48:40.5	64	0.22	1:13
06/15/10 13:27:45.5	65		
06/15/10 13:29:15.5	66		
06/15/10 13:34:49.0	67		
06/15/10 13:35:02.5	68		
06/15/10 13:35:08.5	69	0.05	0:07

Series	Event (2010)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	17
Series Info	Information about the data in the series
Points Used	47
First Point	06/25/10 11:53:07.0
Last Point	08/26/10 12:04:44.0
Duration	62 days 00:30:27.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	47.00
Launch Parameters	Mirrors the launch dialog settings
Description	lila upper 3rd qtr 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2010
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2010)	Depth	Hours:Mins
06/25/10 13:51:40.0	0		
07/24/10 14:07:30.5	1		
07/24/10 16:52:46.5	2		
07/24/10 16:55:30.5	3		
07/24/10 16:59:54.5	4		
07/24/10 17:04:07.0	5		
07/24/10 17:22:24.5	6		
07/24/10 18:01:56.5	7		
07/24/10 18:07:00.5	8		
07/24/10 19:14:43.0	9	0.09	5:07
07/27/10 17:16:46.0	10		
07/27/10 17:28:23.0	11		
07/27/10 17:36:03.0	12		
07/27/10 17:37:22.5	13		
07/27/10 17:40:32.5	14		
07/27/10 19:02:38.5	15		
07/27/10 19:06:43.5	16		

07/27/10 19:12:07.5	17		
07/27/10 19:30:32.5	18		
07/27/10 19:46:29.5	19		
07/27/10 20:18:14.0	20	0.11	3:01
07/28/10 15:31:11.5	21		
07/28/10 17:16:54.0	22		
07/28/10 18:08:08.0	23	0.03	2:36
08/14/10 15:58:23.5	24		
08/14/10 16:41:35.0	25		
08/14/10 16:59:40.0	26		
08/14/10 17:04:52.5	27		
08/14/10 17:13:00.0	28		
08/14/10 17:22:01.0	29		
08/14/10 17:26:32.5	30		
08/14/10 17:32:26.5	31	0.08	1:34
08/15/10 18:38:49.5	32		
08/15/10 18:44:17.0	33		
08/15/10 18:52:39.5	34		
08/15/10 18:59:15.5	35		
08/15/10 19:28:08.5	36	0.05	0:49
08/17/10 12:56:38.5	37		
08/17/10 13:06:41.0	38		
08/17/10 13:13:27.5	39		
08/17/10 13:16:37.0	40		
08/17/10 13:20:26.0	41		
08/17/10 13:30:56.0	42	0.06	0:34
08/18/10 17:39:29.0	43		
08/18/10 17:50:54.0	44	0.02	0:11
08/20/10 15:59:01.0	45		
08/20/10 16:15:13.5	46		
08/20/10 16:19:43.5	47	0.03	0:20

Series	Event (2010)
Logger Info	Information specific to the logger
Model	HOBO Event (C) 1996 ONSET Computer Corp
Serial Number	11370
Memory Size (Bytes)	32768
Extra Info	Information used by tech support
Model Number	7
Version Number	4
Deployment	19
Series Info	Information about the data in the series
Points Used	269
First Point	08/26/10 15:05:44.0
Last Point	11/09/10 13:09:10.0
Duration	74 days 22:03:26.0
Stats	Calculated from the series
Wrap Count	0
Event Sum	269.00
Launch Parameters	Mirrors the launch dialog settings
Description	lila upper 4th qtr 2010
Wrap	Off
Delay Start	Off
Stealth Mode	Off
Event Name	2010
Event Value	1
Lockout After Event	00:00:01.0

Date/Time	Event (2010)	Depth	Hours:Mins	
08/26/10 15:05:44.0		0		
08/29/10 12:42:02.0		1		
08/29/10 12:57:05.0		2		
08/29/10 12:59:24.0		3	0.03	0:17
09/22/10 16:27:02.5		4		
09/22/10 16:28:35.0		5		
09/22/10 16:30:15.5		6		
09/22/10 16:32:31.0		7		
09/22/10 17:14:04.5		8		
09/22/10 17:21:34.0		9		
09/22/10 17:51:29.0		10		
09/22/10 17:59:55.5		11	0.08	1:32
09/25/10 13:24:10.0		12		
09/25/10 17:11:46.0		13	0.02	3:47
10/04/10 21:30:43.5		14		
10/04/10 21:42:31.5		15		
10/04/10 21:42:51.5		16		

10/04/10 21:43:07.0	17		
10/04/10 21:44:01.5	18		
10/04/10 21:45:45.0	19		
10/04/10 22:21:32.0	20	0.07	0:50
10/05/10 04:06:56.0	21		
10/05/10 04:07:50.5	22		
10/05/10 04:08:16.5	23		
10/05/10 04:09:14.5	24		
10/05/10 04:43:01.0	25		
10/05/10 05:01:04.5	26		
10/05/10 05:05:06.0	27		
10/05/10 05:17:13.5	28		
10/05/10 05:23:33.5	29		
10/05/10 05:41:44.5	30		
10/05/10 06:16:01.0	31		
10/05/10 06:32:43.0	32		
10/05/10 06:49:35.0	33		
10/05/10 07:37:01.5	34		
10/05/10 15:23:11.5	35		
10/05/10 15:31:22.0	36		
10/05/10 15:34:30.5	37		
10/05/10 15:36:34.5	38		
10/05/10 15:37:48.0	39		
10/05/10 15:39:14.5	40		
10/05/10 15:40:06.5	41		
10/05/10 15:41:13.5	42		
10/05/10 15:41:56.0	43		
10/05/10 15:42:49.0	44		
10/05/10 15:43:24.5	45		
10/05/10 15:44:46.0	46		
10/05/10 15:46:55.0	47		
10/05/10 15:49:00.0	48		
10/05/10 15:50:18.0	49		
10/05/10 17:21:04.0	50		
10/05/10 17:24:51.5	51		
10/05/10 17:28:01.0	52		
10/05/10 17:29:37.0	53		
10/05/10 17:31:16.0	54		
10/05/10 17:32:11.5	55		
10/05/10 17:33:48.5	56		
10/05/10 17:37:25.5	57		
10/05/10 17:50:44.0	58		
10/05/10 21:22:25.5	59	0.39	17:15
10/06/10 00:05:00.5	60		
10/06/10 00:12:30.0	61		

10/06/10 00:20:13.5	62
10/06/10 00:41:57.0	63
10/06/10 00:48:19.0	64
10/06/10 00:52:16.5	65
10/06/10 00:59:59.5	66
10/06/10 01:05:27.0	67
10/06/10 01:09:11.0	68
10/06/10 01:16:13.0	69
10/06/10 02:11:56.5	70
10/06/10 02:15:41.5	71
10/06/10 02:31:01.5	72
10/06/10 04:32:20.5	73
10/06/10 04:39:28.0	74
10/06/10 04:46:31.0	75
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10/06/10 04:47:57.5	77
10/06/10 04:48:47.5	78
10/06/10 04:49:25.0	79
10/06/10 04:50:20.5	80
10/06/10 04:51:16.5	81
10/06/10 04:53:11.5	82
10/06/10 04:56:16.0	83
10/06/10 05:01:35.0	84
10/06/10 05:05:18.0	85
10/06/10 05:09:27.0	86
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10/06/10 05:21:17.5	88
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10/06/10 05:46:16.0	90
10/06/10 05:55:59.0	91
10/06/10 06:03:22.0	92
10/06/10 06:37:39.0	93
10/06/10 06:42:59.0	94
10/06/10 06:45:34.5	95
10/06/10 06:49:17.5	96
10/06/10 06:51:51.5	97
10/06/10 06:54:37.0	98
10/06/10 06:57:12.0	99
10/06/10 07:00:55.0	100
10/06/10 07:03:07.0	101
10/06/10 07:08:30.5	102
10/06/10 07:21:58.0	103
10/06/10 12:00:15.5	104
10/06/10 12:08:56.0	105
10/06/10 12:14:17.0	106

10/06/10 12:19:19.0	107
10/06/10 16:09:57.0	108
10/06/10 16:10:20.0	109
10/06/10 16:10:45.0	110
10/06/10 16:11:02.0	111
10/06/10 16:11:19.0	112
10/06/10 16:11:27.5	113
10/06/10 16:11:35.0	114
10/06/10 16:11:38.0	115
10/06/10 16:12:06.0	116
10/06/10 16:12:59.5	117
10/06/10 16:13:30.5	118
10/06/10 16:13:43.5	119
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10/06/10 16:14:32.5	121
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10/06/10 16:16:07.0	124
10/06/10 16:16:43.5	125
10/06/10 16:17:15.0	126
10/06/10 16:17:54.5	127
10/06/10 16:18:26.0	128
10/06/10 16:19:05.0	129
10/06/10 16:19:38.5	130
10/06/10 16:20:23.0	131
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10/06/10 16:22:10.0	133
10/06/10 16:23:04.0	134
10/06/10 16:24:15.0	135
10/06/10 16:25:20.5	136
10/06/10 16:26:32.0	137
10/06/10 16:27:25.5	138
10/06/10 16:28:55.5	139
10/06/10 16:30:25.0	140
10/06/10 16:32:29.0	141
10/06/10 16:34:31.0	142
10/06/10 16:35:53.0	143
10/06/10 16:36:45.0	144
10/06/10 16:38:12.5	145
10/06/10 16:39:47.0	146
10/06/10 16:42:08.0	147
10/06/10 16:43:57.0	148
10/06/10 16:46:04.5	149
10/06/10 16:48:00.5	150
10/06/10 16:50:01.0	151

10/06/10 16:52:03.5	152		
10/06/10 16:53:50.5	153		
10/06/10 16:55:22.0	154		
10/06/10 16:56:52.0	155		
10/06/10 16:58:01.0	156		
10/06/10 16:59:24.0	157		
10/06/10 17:00:30.0	158		
10/06/10 17:02:05.0	159		
10/06/10 17:03:29.5	160		
10/06/10 17:05:06.5	161		
10/06/10 17:06:33.5	162		
10/06/10 17:09:06.0	163		
10/06/10 17:10:46.0	164		
10/06/10 17:12:42.0	165		
10/06/10 17:14:59.0	166		
10/06/10 17:17:25.5	167		
10/06/10 17:19:12.0	168		
10/06/10 17:21:05.0	169		
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10/06/10 17:26:18.0	174		
10/06/10 17:27:53.0	175		
10/06/10 17:29:19.0	176		
10/06/10 17:30:50.0	177		
10/06/10 17:32:31.5	178		
10/06/10 17:35:17.5	179		
10/06/10 17:37:26.0	180		
10/06/10 17:39:49.5	181		
10/06/10 17:48:06.5	182		
10/06/10 17:53:21.5	183		
10/06/10 17:58:27.0	184		
10/06/10 18:05:48.5	185		
10/06/10 22:03:48.0	186		
10/06/10 23:37:30.5	187		
10/06/10 23:41:27.5	188	1.29	23:36
10/07/10 00:28:45.5	189		
10/07/10 00:29:08.5	190		
10/07/10 00:29:35.0	191		
10/07/10 00:30:12.0	192		
10/07/10 00:32:25.5	193		
10/07/10 18:15:49.0	194		
10/07/10 18:20:09.5	195		
10/07/10 18:22:50.0	196		

10/07/10 18:31:46.5	197	0.08	18:03
10/18/10 00:05:31.5	198		
10/18/10 00:17:05.0	199		
10/18/10 02:12:23.0	200		
10/18/10 02:29:28.0	201		
10/18/10 05:47:51.0	202		
10/18/10 06:08:07.5	203		
10/18/10 06:12:10.0	204		
10/18/10 06:20:06.0	205		
10/18/10 06:46:10.5	206		
10/18/10 07:32:25.0	207		
10/18/10 08:08:43.5	208		
10/18/10 08:56:48.5	209		
10/18/10 09:09:22.5	210		
10/18/10 09:55:17.5	211		
10/18/10 14:52:21.0	212		
10/18/10 15:11:29.0	213	0.16	15:05
10/22/10 08:19:00.0	214		
10/22/10 09:09:32.5	215		
10/22/10 12:30:15.5	216		
10/22/10 13:23:00.0	217		
10/22/10 15:21:42.0	218		
10/22/10 16:06:27.5	219		
10/22/10 16:24:34.0	220		
10/22/10 16:36:51.0	221		
10/22/10 17:36:51.0	222		
10/22/10 18:50:37.0	223	0.1	10:31
10/23/10 17:50:40.0	224		
10/23/10 18:21:59.5	225		
10/23/10 18:22:48.0	226		
10/23/10 18:26:55.5	227	0.04	0:36
10/25/10 06:07:14.5	228		
10/25/10 06:08:48.0	229		
10/25/10 06:10:46.0	230		
10/25/10 06:16:15.5	231		
10/25/10 06:22:13.0	232		
10/25/10 06:27:46.5	233		
10/25/10 06:30:00.0	234		
10/25/10 06:32:38.0	235		
10/25/10 06:34:57.5	236		
10/25/10 06:37:54.5	237		
10/25/10 06:40:09.0	238		
10/25/10 06:43:25.5	239		
10/25/10 06:47:07.0	240		
10/25/10 06:56:55.5	241		

10/25/10 07:12:47.5	242		
10/25/10 07:27:45.0	243	0.16	1:20
10/30/10 18:50:41.0	244		
10/30/10 19:00:41.0	245		
10/30/10 19:05:13.0	246		
10/30/10 19:08:55.5	247		
10/30/10 19:18:55.5	248		
10/30/10 19:23:44.5	249		
10/30/10 19:28:46.5	250		
10/30/10 19:41:47.5	251		
10/30/10 20:03:10.0	252		
10/30/10 20:25:29.5	253	0.1	1:34
11/08/10 16:58:48.0	254		
11/08/10 17:09:14.0	255		
11/08/10 17:18:08.5	256		
11/08/10 17:25:31.0	257		
11/08/10 17:25:52.0	258		
11/08/10 17:26:33.5	259		
11/08/10 17:27:06.0	260		
11/08/10 17:27:39.0	261		
11/08/10 17:28:16.5	262		
11/08/10 17:31:44.0	263		
11/08/10 18:38:38.5	264		
11/08/10 18:50:40.0	265		
11/08/10 18:53:30.0	266		
11/08/10 18:59:26.0	267		
11/08/10 19:06:17.5	268		
11/08/10 19:36:58.0	269	0.16	2:38

ATTACHMENT B

Crest Gauge and Siphon Data

2010 Crest Gauges
Little Park Area

Intermittent Washes

Month	Date	CG-1	CG-2	CG-3	CG-4	CG-5	CG-6	CG-7	Initials of Observer	Entered on Database
January										
February										
March	3/23/2010	NF							RJM	
April	4/20/2010		NF	NF	NF	NF	NF	NF	RJM	
May										
June	6/25/2010	NF	NF	NF	NF	NF	NF	NF	RJM	
July										
August										
September	8/24/2010	NF	NF	NF	NF	1" Deep 4' Wide No Sample	NF	0.5" Deep 6' Wide No Sample	DM	
October	10/15/2009	8" Deep 9' Wide Sample**	NF*	NF*	NF*	4" Deep# 11' Wide No Sample	NF*	11" Deep 15' Wide No Sample	TJS	
November										
December										

* Intakes of samplers and crest gauges plugged or sites destroyed or bypassed, sites reconstructed

** Partial sample collected, insufficient water for analysis

\# Majority of flow bypassed site, new low flow section of channel cut

Attachment 2

Typical Surface Water Sampler Photos



Photo of Crest Gauge and Single Stage Sampler initially set up and the same plugged by debris



Photo of one of the more severe events – Note the bent T-post and buried Crest Gauge





Photos of mobile bed directing flow away for the samplers

0004

Original: PGL
Copy: JRB



southern
utah
wilderness
alliance

January 4, 2007

John Baza – Director
Pamela Grubaugh-Littig – Permit Supervisor
Division of Oil, Gas and Mining
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Incoming
1/007/013

Re: Horse Canyon Mine, Lila Canyon Extension C/007/013 Permit Application

Dear Director Baza:

We write to you concerning the results a summer 2006 on-the-ground survey conducted by Mr. Elliott Lips (at SUWA's request) in the proposed Lila Canyon Mine permit area. In sum, Mr. Lips concludes the following:

- Numerous seeps and springs exist in the Little Park Wash drainage (and its tributary drainages) of the permit area. These sites support mature stands of mesic vegetation – including mature cottonweed trees in excess of 30 feet in height. These seeps and springs may be an important source of water for wildlife and Mr. Lips noticed abundant fresh animal tracks near discharge points and for several hundred feet downstream.

- The 4 seeps and springs that UEI proposes to monitor (L-7-G, L-8-G, L-9-G, L-12-G) are a small fraction of the total number of seeps and springs that exist in the permit and adjacent area and that could be impacted by mining. Some of the proposed monitoring points are not the most significant springs in their respective drainages.

- UEI proposes no monitoring of any seeps or springs in Upper Little Park Wash, Reach #3 Wash, or the upper part of Noname Wash. UEI is thus excluding nearly half of the tributary drainages from any monitoring, even though there are 13 identified seeps and springs in these drainages.

JAN 05 2007

- Previous seep and spring surveys referenced in the MRP may not have identified all the seeps and springs recorded by Mr. Lips. Neither the

425 East 100 South
Salt Lake City, Utah 84111
Phone: 801-486-3161
Fax: 801-486-4233
Website: www.suwa.org

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MRP nor the studies referenced therein contain latitude and longitude or UTM coordinates for the identified seeps and springs.

- UEI has not collected the required baseline data for seeps and springs that were not previously identified.

SUWA provides this information to the Division as the Division reviews recent submission from UtahAmerican Energy and also in support of SUWA's position that the Division must deny the permit application.

Sincerely,

Stephen Bloch
Staff Attorney

Original: PGL
Copy: JRB

Elliott W. Lips, P.G. Ph.D. (ABD)
2241 E. Bendemere Circle
Salt Lake City, Utah 84109
(801) 599-2189
elips@geog.utah.edu

December 18, 2006

Stephen Bloch
Staff Attorney
Southern Utah Wilderness Alliance
425 East 100 South
Salt Lake City, Utah 84111

RE: Seeps and Springs – Lila Canyon

Dear Steve:

Introduction

On June 22 and 23, 2006, I conducted a survey of portions of the Lila Canyon permit and adjacent area in order to observe seeps and springs. The survey was conducted by traversing, on foot, the lower portions of the six major tributary drainages to Little Park Wash and a portion of the upper part of Lila Canyon. Figure 1 shows the locations of these drainages. This survey was not intended to systematically inventory all seeps and springs in the permit and adjacent area.

In the course of the survey, I collected the following data at each seep or spring observed.

- Location - The location was documented by recording the latitude and longitude in a hand-held GPS unit. Satellite reception was good and I was able to establish the location at all times during the survey, even in the canyons.
- Flow Rate - The flow was determined by estimating the time required to fill a one-gallon container.
- Extent of Flow - The extent of flow was estimated by pacing off the distance below the seep or spring where water was flowing at the surface or where the ground was wet.
- Notes - Observations were made of vegetation other than the dominant vegetation in the area (Piñon-Juniper, desert shrubs, and sage brush-grasses). Observations were also made of wildlife use as evident from fresh tracks in and around the seeps and springs.

Table 1 provides a summary of these data.

Results

As a result of this two-day, reconnaissance-level survey, I was able to identify 23 seeps and springs in the permit and adjacent area (Figure 1). Seeps and springs were observed flowing in all 6 tributary drainages to Little Park Wash and in the upper part of Lila Canyon. Flows varied from slightly less than 1 gallon per minute to 3 gallons per minute. Water discharging from the seeps and springs flowed down the channels for distances up to 800 feet. In the vicinity of several of the seeps and springs, vegetation consisted of columbine, rose, aspen, cottonwood, and willow. Several of the seeps and springs had evidence of recent wildlife use.

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Discussion

Some of these seeps and springs may have been previously identified by UEI; however, confirmation of this is not possible because UEI does not provide latitude and longitude (or UTM) coordinates for the seeps and springs in the MRP. Based on the maps in the MRP, it appears as though some of the seeps and springs identified as flowing on June 22 and 23, 2006 have not been identified by previous seep and spring surveys.

In the Little Park Wash area, UEI proposes to monitor only 4 seeps and springs (L-7-G, L-8-G, L-9-G, and L-12-G). This is only a small fraction of the seeps and springs that exist in the permit and adjacent area and that could be impacted by mining. In addition, in the drainages where UEI proposes monitoring, there are springs with greater flow than those UEI proposes to monitor. Furthermore, UEI proposes no monitoring of any seeps or springs in Upper Little Park Wash, Reach #3 Wash, or the upper part of Noname Wash. Thus, UEI is excluding nearly half of the tributary drainages from any monitoring, even though there are 13 seeps and springs in these drainages (see Figure 1).

The mesic vegetation associated with the seeps and springs identified in this survey indicate that these sites have experienced flow for long periods of time. Some sites had groves of cottonwood trees in excess of 30 feet in height. In addition, these seeps and springs are an important source of water for wildlife as evident by the abundant fresh tracks near the discharge point and for several hundred feet downstream.

Summary

Numerous seeps and springs exist in the Little Park Wash drainage (and its tributary drainages) of the permit area. These sites support mature stands of mesic vegetation in an otherwise arid environment and provide an important source of water for wildlife.

Because of the lack of data in the MRP, it is not clear if UEI has previously identified these significant sources of water; however, it appears that some of these seeps and springs have not been included in previous seep and spring surveys referenced in the MRP.

Of the 21 seeps and springs identified in this survey in the Little Park Wash area, UEI only proposes to monitor 4 sites. In some cases these sites are not the most significant spring in the drainage. UEI proposes no monitoring in approximately one half of the Little Park Wash area, even though there are at least 13 seeps and springs that could be impacted by mining activities. UEI has not collected the required baseline data on these sites so it will be impossible to assess future impacts.

Sincerely,

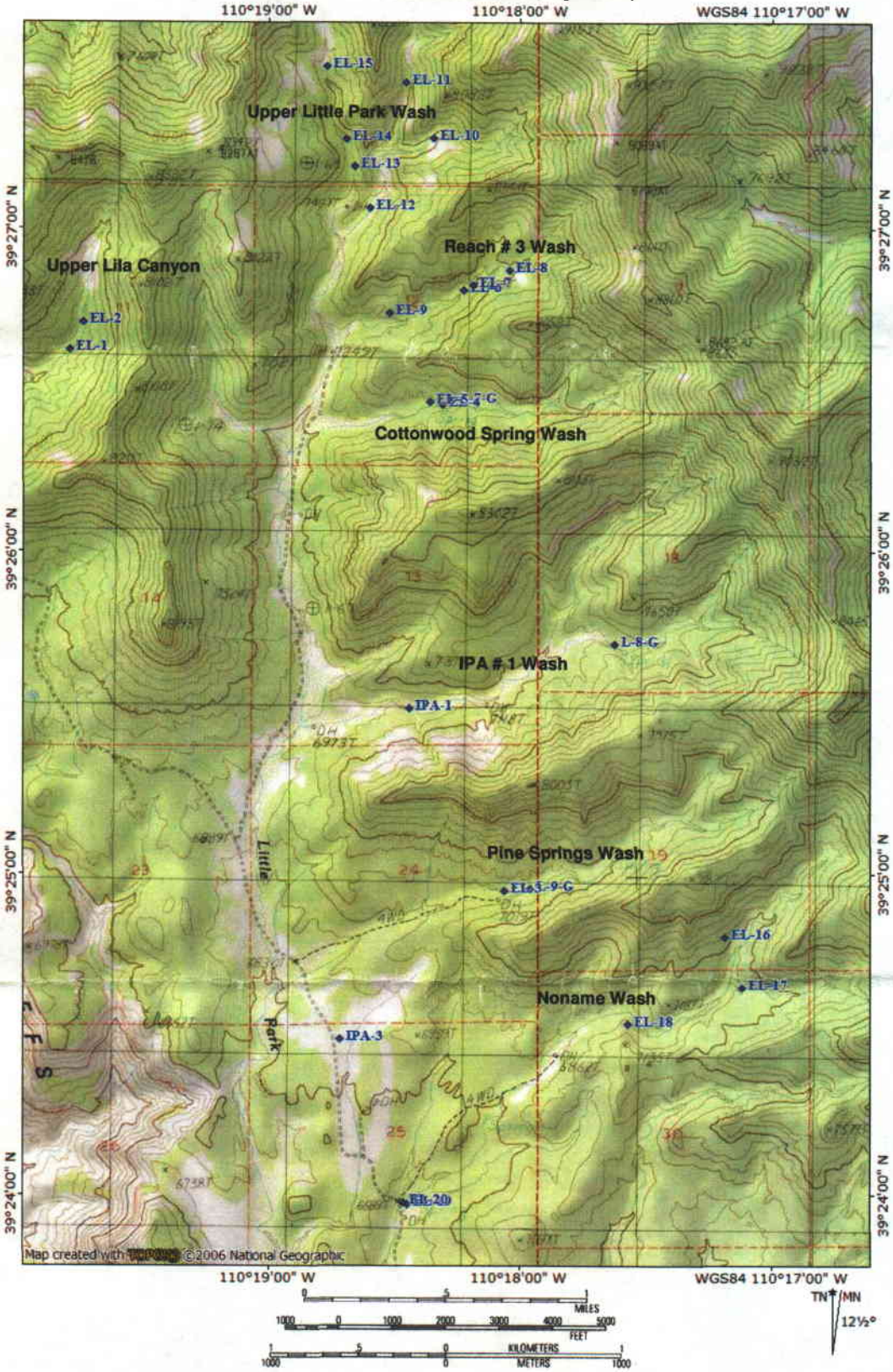
Elliott W. Lips, P.G. Ph.D. (ABD)

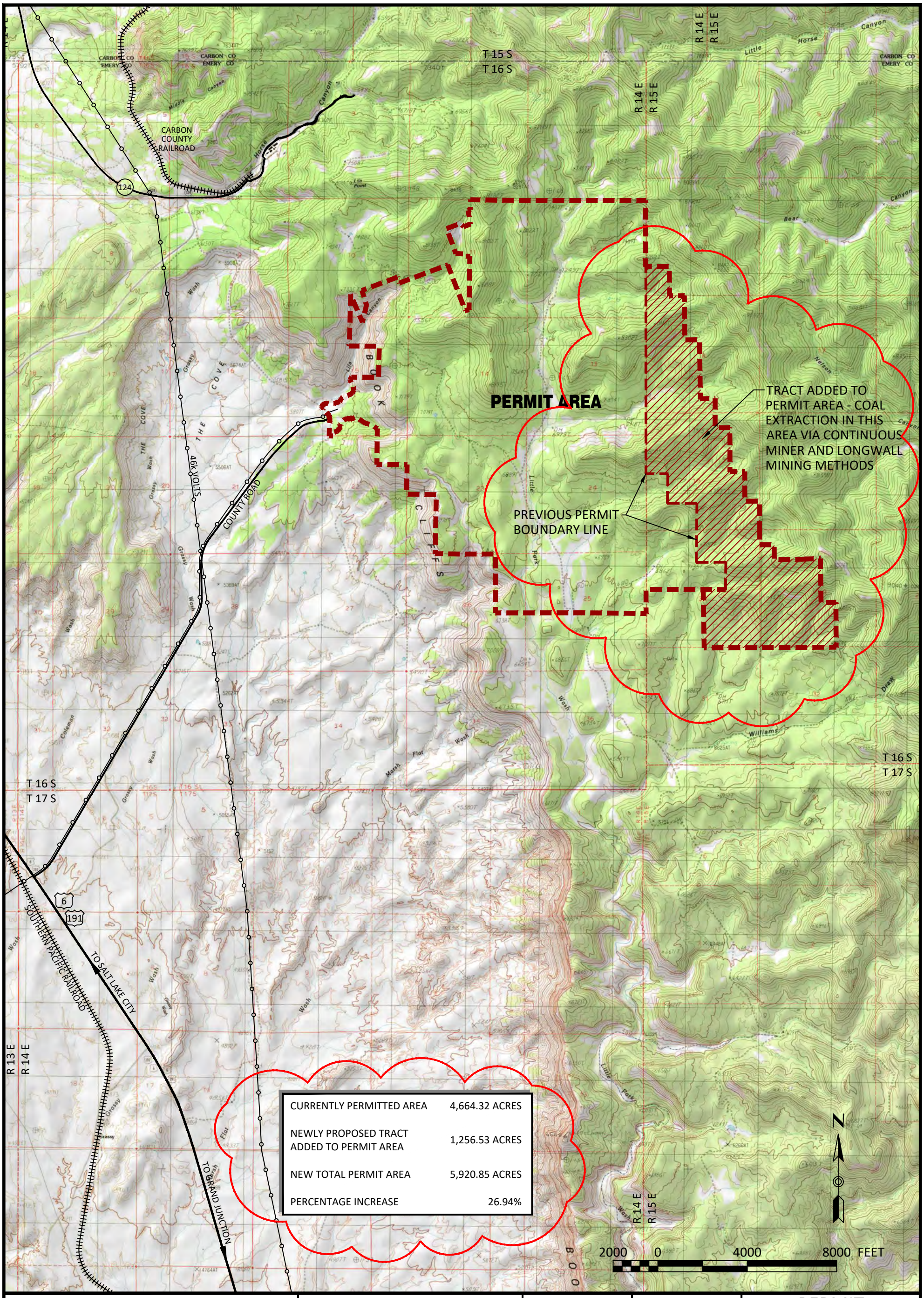
Table 1. Seep and Spring Summary Data

ID	LATITUDE[1]	LONGITUDE[1]	FLOW (gpm)	NOTES
EL-1	39°26.625'N	110°19.786'W	1-3	Abundant columbine and rose
EL-2	39°26.708'N	110°19.732'W	1-3	Abundant columbine
EL-3	39°24.947'N	110°18.061'W	≈ 1	About 500 ft below L-9-G, Flow on surface for ≈ 200 ft
EL-4	39°26.453'N	110°18.309'W	1-2	Below L-7-G, Flow on surface for ≈ 300 ft
EL-5	39°26.462'N	110°18.355'W	2-3	Abundant columbine and rose, Wildlife use, Flow on surface for ≈ 500 ft
EL-6	39°26.809'N	110°18.226'W	≈ 1	Flow greater than L-7-G, Flow on surface for ≈ 200 ft
EL-7	39°26.822'N	110°18.186'W	≈ 1	
EL-8	39°26.870'N	110°18.044'W	≈ 1	Flow on surface for ≈ 200 ft
EL-9	39°26.738'N	110°18.518'W	< 1	Flow on surface for ≈ 30 ft
EL-10	39°27.280'N	110°18.347'W	< 1	Flow on surface for ≈ 50 ft
EL-11	39°27.455'N	110°18.456'W	≈ 3	Flow on surface for ≈ 500 ft
EL-12	39°27.065'N	110°18.598'W	≈ 1	Flow on surface for ≈ 100 ft
EL-13	39°27.194'N	110°18.660'W	≈ 3	Abundant wildlife use Flow on surface for ≈ 600-800 ft
EL-14	39°27.277'N	110°18.693'W	≈ 1	Mature cottonwood, willow and aspen trees Abundant wildlife use Ground wet for ≈ 300 ft
EL-15	39°27.503'N	110°18.770'W	≈ 1	Mature cottonwood trees Ground wet for ≈ 200 ft
EL-16	39°24.802'N	110°17.183'W	< 1	Columbine Ground wet for ≈100 ft
EL-17	39°24.644'N	110°17.116'W	≈ 1	Ground wet for ≈ 200 ft
EL-18	39°24.529'N	110°17.569'W	< 1	Abundant columbine Ground wet for ≈100 ft
EL-19	39°23.971'N	110°18.447'W	≈ 1	Flow on surface for ≈ 200 ft
EL-20	39°23.975'N	110°18.461'W	1-2	Ground wet for ≈ 300 ft above road
L-7-G	39°26.466'N	110°18.264'W	< 1	Round tank near fence Ground wet for ≈ 50 ft
L-8-G	39°25.713'N	110°17.624'W	1-3	Flow on surface for ≈ 500 ft
L-9-G	39°24.953'N	110°17.958'W	≈ 1	Metal tanks Flow on surface for ≈ 200-300 ft
IPA-1	39°25.512'N	110°18.440'W		
IPA-3	39°24.482'N	110°18.717'W		

[1] WGS 84

Figure 1 - June 2006 Seep and Sping Survey





LEGEND:

PERMIT AREA BOUNDARY:

OVERHEAD POWER LINES:

EXISTING RAILROAD TRACKS:

NOTE:

Plate 1-1 is the official permit boundary map and it will be used to clarify any questions about the permit boundaries.

		REVISIONS	
DATE	BY	DATE	BY
08/03/2022	RA	12/13/2000	BJ
		10/02/2002	RJM
		02/08/2016	PJJ
		08/03/2016	PJJ
		01/03/2019	PJJ
		3/09/2021	PJJ
		1/6/2022	PJJ
		3/22/2022	PJJ

PERMIT AREA MAP

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: SEPT. 2000

PLATE 1-1

R 13 E
R 14 E
R 14 E
R 15 E
T 15 S
T 16 S
T 16 S
T 17 S
CARBON COUNTY RAILROAD
SURFACE FACILITIES
PROPOSED COUNTY ROAD
SOUTHERN PACIFIC RAILROAD
46K Volts
COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS
TO SALT LAKE CITY
TO GRAND JUNCTION

SOIL LEGEND:

SOILS WITHIN THE DISTURBED SURFACE FACILITIES:

RR	Senchert loam, 3–15% slopes
NGC2	Gerst–Strych–Badland Complex, 30–70% slopes
NXC	Travesilla sandy loam, 1–8% slopes
R2H	Travessilla family–Rock outcrop complex
BMD	Strych very stony fine sandy loam, 3–30% slopes
BL	Persao–Chipeta Badland, 3–20% slopes
BNE2	Strych, very bouldery fine sandy loam, 3–20% slopes

PERMIT AREA:

Disturbed Area

Area of Undisturbed within Disturbed Area

REVISION DATE:

DATE:	BY:	DATE:	
Jan 2008	RJM		
DEC 2010	RJM		
MAR 2022	PJJ		
AUG 2022	RSA		

N

1000' 0' 2000' 4000'

LILA CANYON MINE

SOILS MAP

DATE: MAY 1998

DESIGNED BY: EIS

SCALE: AS SHOWN

PLATE #: PLATE 2-1

R. 14 E.
R. 15 E.
T. 16 S.
T. 17 S.

Pinyon-Juniper
Spruce/Fir
Sagebrush/Grass
Salt Desert Shale / Bare Ground
Grass/Shrub
Grass

5) L-1-G
5) L-2-S
5) L-3-S
5) L-4-S
5) L-5-G
5) L-7-G
5) L-8-G
5) L-10-S
5) L-11-G
5) L-12-G
5) L-14-S
4) L-15-G
4) L-17-G

LILA CANYON ROAD
Reference Area

TRACT ADDED TO PERMIT AREA - COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS

PREVIOUS PERMIT BOUNDARY LINE

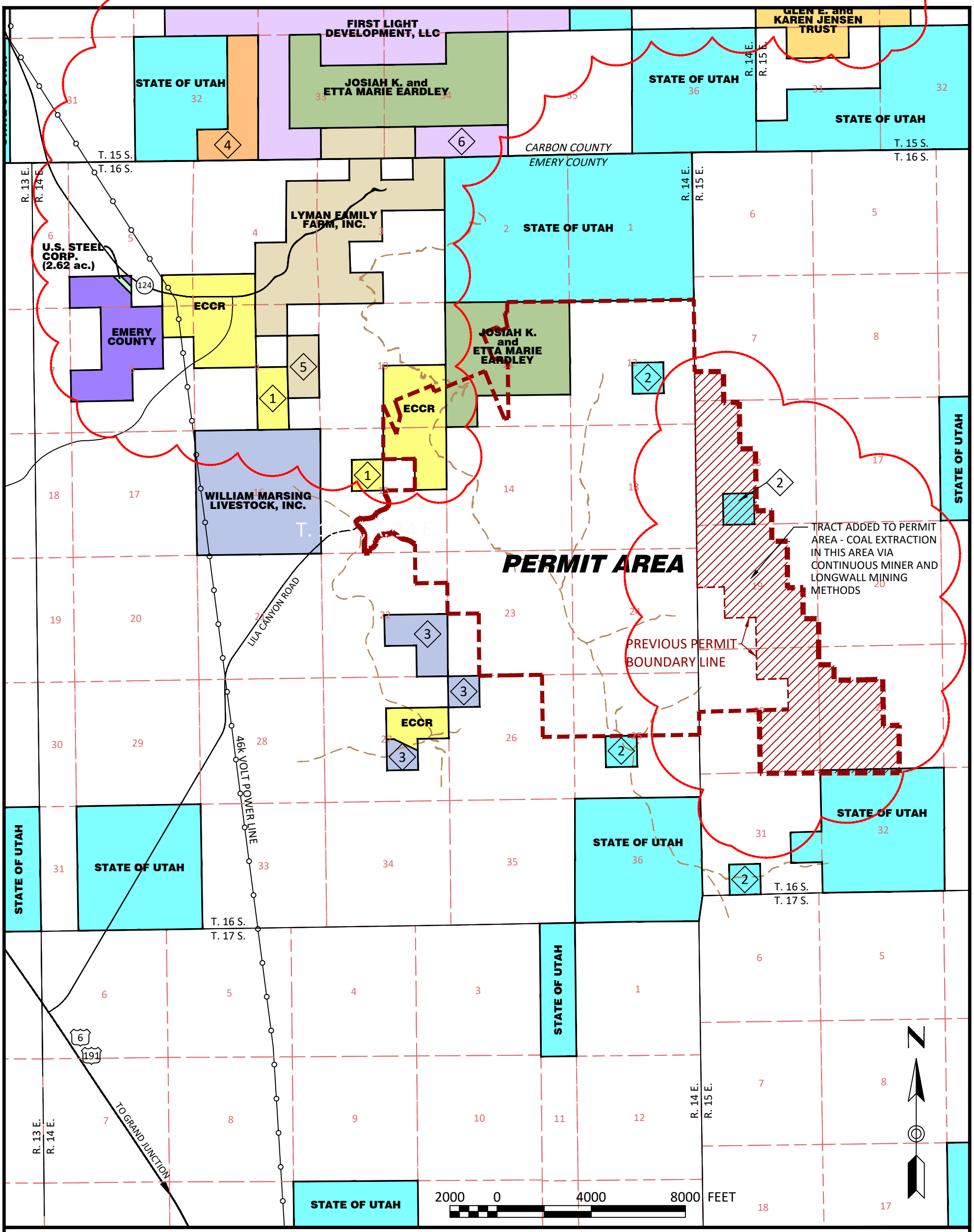
N

625 0 1250 2500 FEET

VEGETATION MAP	REVISIONS	
LILA CANYON MINE	DATE	BY
23415 North Lila Canyon Road	10/12/2018	PJJ
Green River, Utah 84525	1/6/2022	PJJ
DOGM PERMIT# C0070013	3/22/2022	PJJ
DESIGN BY: EIS	8/26/2022	NGN
SCALE: 1" = 1,250'		
ORIGINAL DATE: OCT. 2002		
PLATE 3-2		

Spring Vegetation Key
(See Appendix 7-8 for Additional Details)
1) Habitat overstory is Douglas Fir-Mountain Brush association.
2) Habitat is predominantly Pinyon-Juniper and sagebrush grass associations.
3) Wet meadow habitat with an overstory of Pinyon-Juniper and sagebrush grass associations.
4) Habitat is a mix of grasses and salt desert shrub habitat and invasive tamarisk.
5) Habitat is a sagebrush with Pinyon-Juniper overstory.

LEGEND:
- Salt Desert Shale / Bare
- Sagebrush / Grass
- Pinyon-Juniper
- Spruce/Fir
- Grass / Shrub
- Permit Boundary
- Spring Vegetation Key and Water Monitoring Location — 2) L-15-G



KEYED PROPERTY NOTES

1. **EMERY COUNTY COAL RESOURCES, INC.**
2. **STATE OF UTAH**
3. **WILLIAM MARSING LIVESTOCK, INC.**
4. **LEVADA EF FIVE, LLC**
5. **LYMAN FAMILY FARM, INC.**
6. **FIRST LIGHT DEVELOPMENT, LLC**

NOTE:
ALL SURFACE LANDS OWNED BY THE BUREAU OF LAND MANAGEMENT (UNITED STATES) UNLESS NOTED OTHERWISE.

LEGEND:

PERMIT AREA :

- Emery County
- Lyman Family Farm, Inc.
- Josiah K. & Etta Marie Eardley
- Levada EF Five, LLC
- State of Utah
- Emery County Coal Resources, Inc. (ECCR)
- William Marsing Livestock, Inc.
- First Light Development, LLC
- U.S. Steel

REVISIONS

DATE	BY	DATE	BY
AUG. 2000	BJ	AUG. 26, 2022	NGN
DEC. 2000	BJ		
SEPT. 2002	RJM		
AUG. 2003	RJM		
DEC. 2005	RJM		
FEB. 8, 2016	PJJ		
JAN 6, 2022	PJJ		
MAR. 22, 2022	PJJ		

SURFACE OWNERSHIP

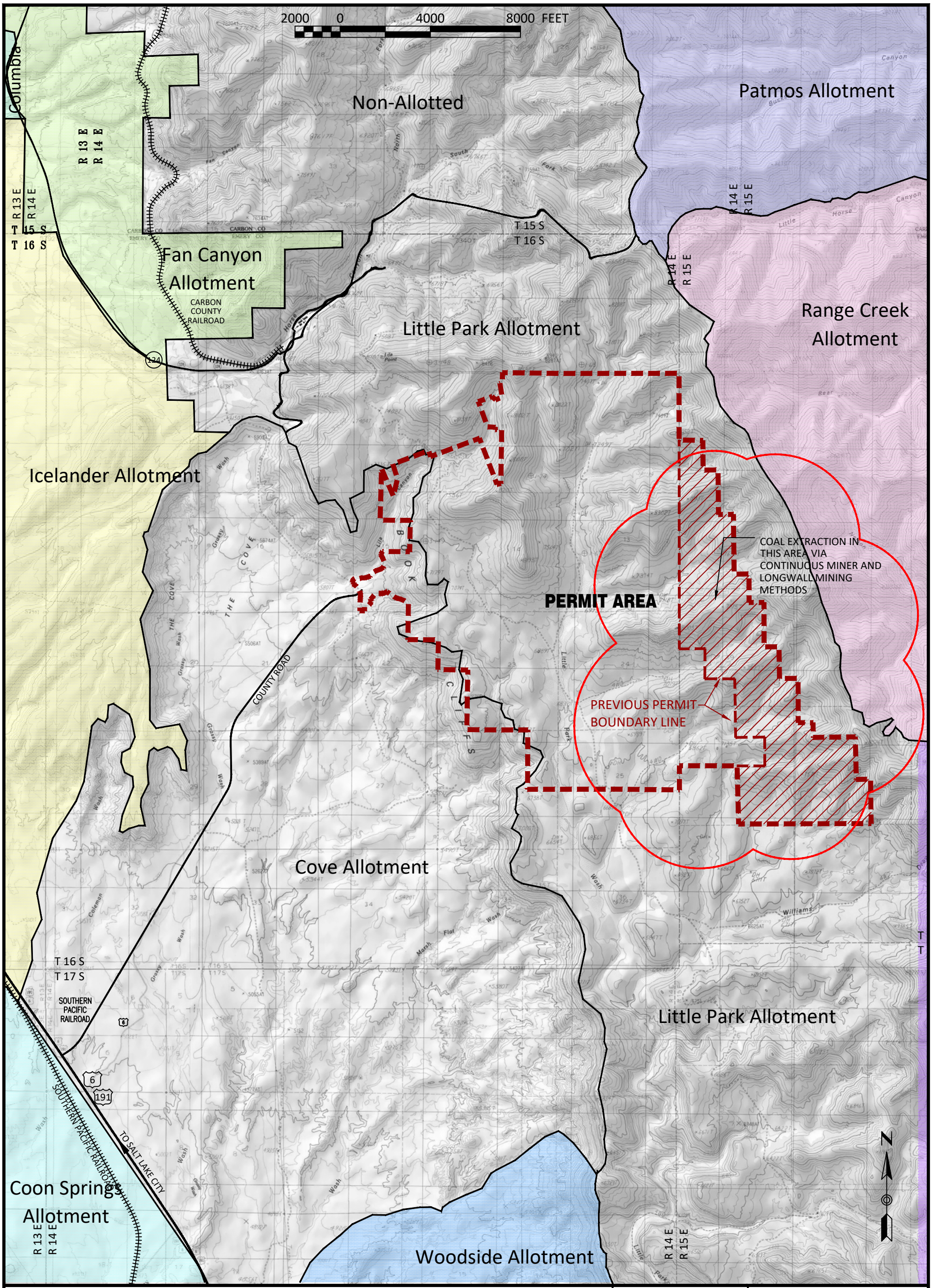
LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 4,000'
ORIGINAL DATE: JULY 1999

PLATE 4-1



LEGEND:

PERMIT AREA : ▬ ▬ ▬

GRAZING ALLOTMENTS:

- Columbia Allotment
- Coon Springs Allotment
- Cove Allotment
- Fan Canyon Allotment
- Icelander Allotment
- Little Park Allotment
- Non-Allotted
- Patmos Allotment
- Range Creek Allotment
- Woodside Allotment

REVISIONS	
DATE	BY
AUG. 29, 2000	BJ
DEC. 14, 2000	BJ
SEPT. 19, 2002	RJM
FEB. 8, 2016	PJJ
JAN. 6, 2022	PJJ
MAR. 22, 2022	PJJ
AUG. 10, 2022	RSA

GRAZING ALLOTMENTS

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

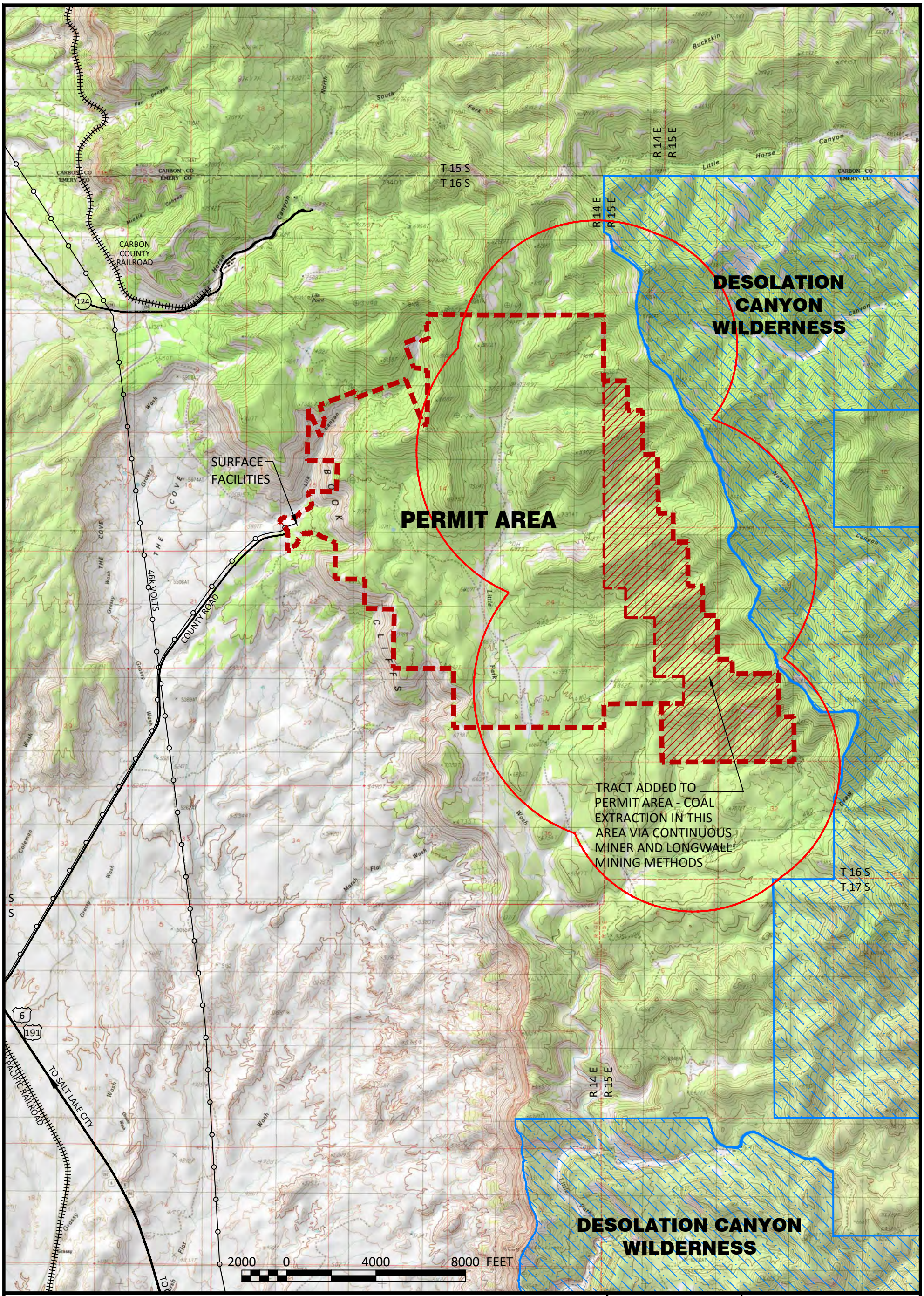
DOGM PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: APRIL 1998

PLATE 4-2



LEGEND:

PERMIT AREA :

PREVIOUS PERMIT AREA :

DESOLATION CANYON WILDERNESS AREA:

N

REVISIONS	
DATE	BY
12/2000	BJ
09/2002	RJM
02/08/2016	PJJ
1/6/2022	PJJ
3/22/2022	PJJ
8/28/2022	NGN

FEDERAL WILDERNESS

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

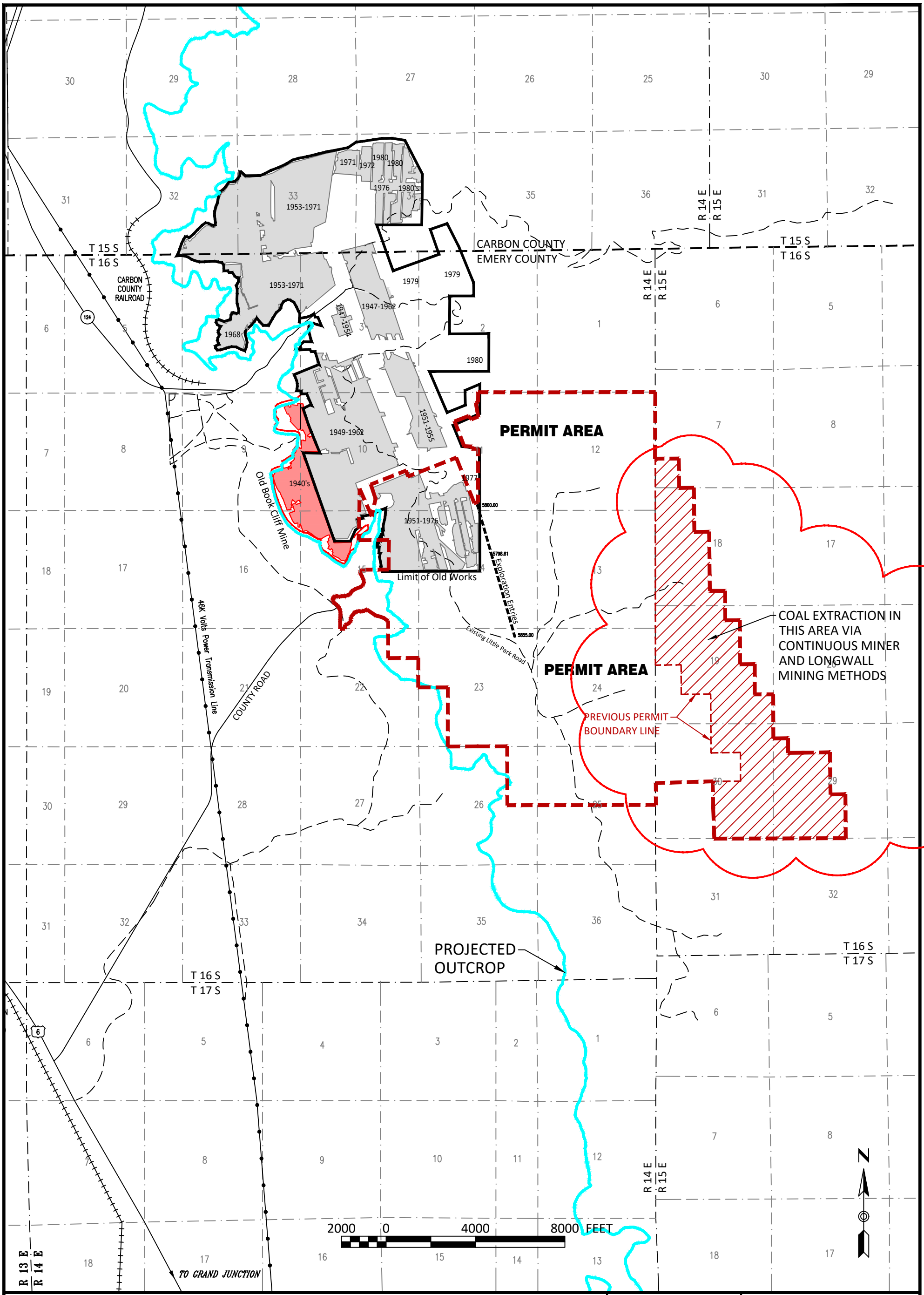
DOGM PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: SEPT. 2000

PLATE 4-4



LEGEND:

- PERMIT AREA :
- EXISTING PAVED ROADS :
- EXISTING UNPAVED ROADS :
- LIMIT OF OLD WORKS :
- BOOK CLIFFS COAL COMPANY :
- EXPLORATION ENTRIES :

REVISIONS

DATE	BY
8/29/2000	BJ
12/14/2000	BJ
09/20/2002	RJM
12/29/2004	RJM
02/08/2016	PJJ
1/6/2022	PJJ
3/22/2022	PJJ
8/10/2022	RSA

PREVIOUSLY MINED AREAS

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: MAY 1998

PLATE 5-1

CARBON COUNTY RAILROAD

DESOLATION CANYON WILDERNESS

EXISTING MINE WORKINGS

R 14 E
R 15 E

NORTH LILA CANYON FAULT

PANEL #16
PANEL #17
PANEL #18
PNL #19
PANEL #11
PANEL #12
PANEL #13
PANEL #14
PANEL #15
PANEL #1
PANEL #2
PANEL #3
PANEL #4
PANEL #5
PANEL #6
PANEL #7
PANEL #8
PANEL #9
PANEL #10

COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS

PROJECTED FAULT ZONE

COUNTY ROAD

46k VOLTS

T 16 S
T 17 S

WILLIAM'S DRAW FAULT

SOUTH BOUNDARY FAULT

R 14 E
R 15 E

750 0 1500 3000 FEET

N

LEGEND:

- PERMIT AREA :
- PREVIOUS PERMIT AREA :
- COAL OUTCROP :
- PAVED ROAD:
- FEDERAL WILDERNESS AREA :
- 200' OUTCROP BARRIER :
- MAXIMUM EXTENT OF POTENTIAL SUBSIDENCE: (USING 21.5° DRAW ANGLE)
- SUBSIDENCE MONITORING POINT :
- POWER LINE:
- PROJECTED MINING:
- FAULTS :

LILA CANYON MINE WORKINGS
PARTIAL COAL EXTRACTION:
(NO SUBSIDENCE)
EXISTING — PROJECTED

LILA CANYON MINE WORKINGS
FULL COAL EXTRACTION:
(POTENTIAL SUBSIDENCE)
EXISTING — PROJECTED

REVISION DATE:

DATE:	BY:	DATE:	BY:
NOV. 20, 1999	BJ	MAR. 22, 2022	PJJ
AUG. 29, 2000	BJ	AUG. 10, 2022	RSA
JAN. 09, 2001	BJ		
MAR. 21, 2001	BJ		
SEPT. 20, 2002	RJM		
AUG. 19, 2003	RJM		
DEC. 20, 2004	RJM		
JANUARY 2005	RJM		
FEBRUARY 2007	RJM		
FEB. 8, 2016	PJJ		
JUNE 1, 2016	PJJ		

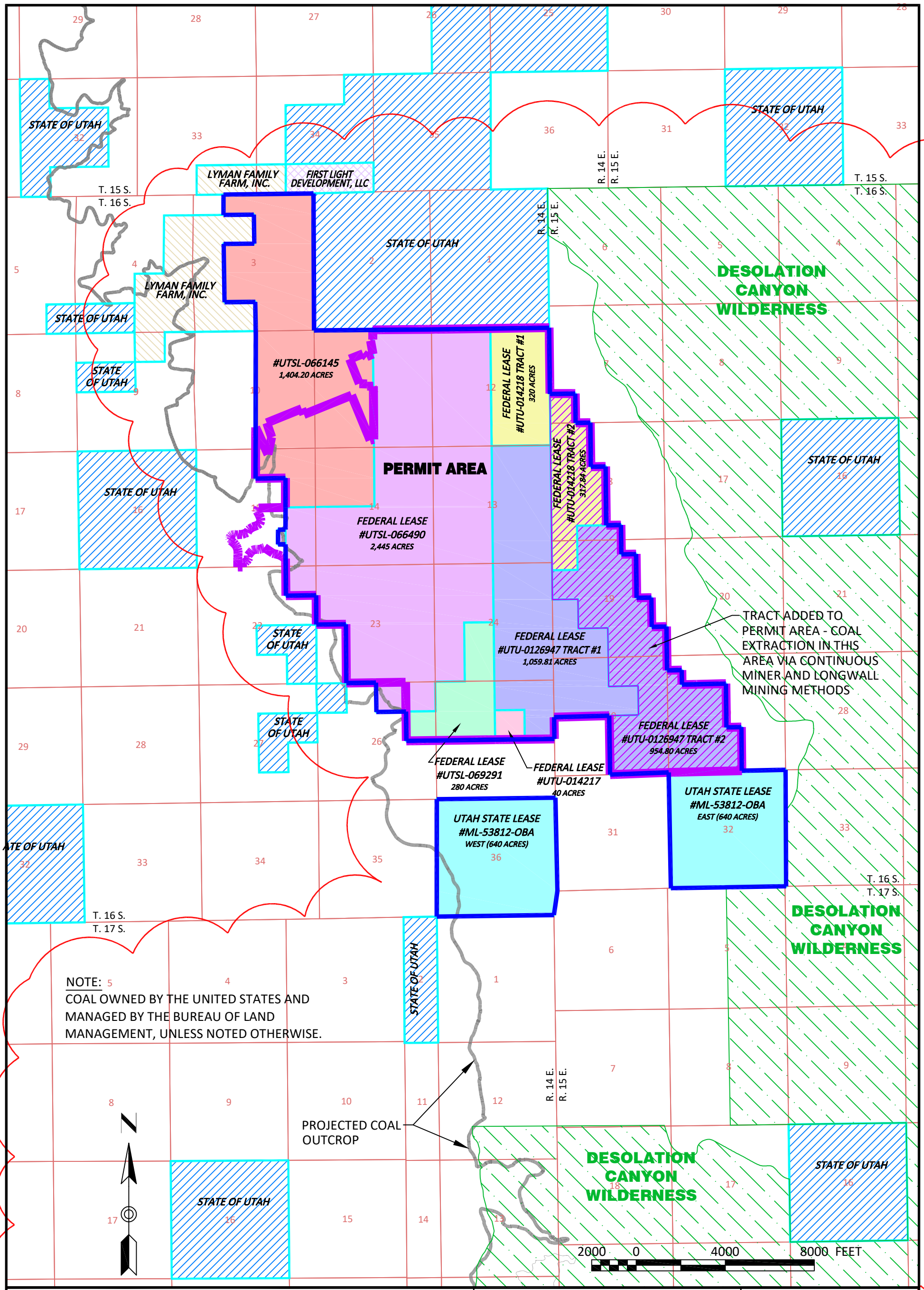
NOTES:

1. Mine projections are subject to change depending upon conditions encountered in the underground mine workings.
2. Actual mine works are shown as of February 1, 2022.
3. All mine projections depicted in the areas beyond the permit area are speculative and based upon 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.
4. Emery County Coal Resources, Inc. acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.
5. Longwall panels will be reconfigured as needed to prevent unauthorized subsidence beyond the permit area if extended reserves are not acquired in the future.
6. Additional control points may be added as mining advances.

LILA CANYON MINE

Subsidence Control Map

DATE:	DRAWN BY:
NOVEMBER 1999	UEI
SCALE: 1" = 300'	PLATE #: Plate 5-3



LEGEND:

- PERMIT AREA :
- PREVIOUS PERMIT AREA :
- LEASE UTSL-066490
- LEASE UTU-014218
- LEASE UTU-0126947
- LEASE UTSL-046512
- LMU #UTU-73516:
- LEASE UTSL-066145
- LEASE UTU-014217
- LEASE UTSL-069291
- Emery County Coal Resources, Inc.

REVISIONS

DATE	BY	DATE	BY
8/29/2000	BJ	3/22/2022	PJJ
12/13/2000	BJ	8/26/2022	NGN
09/20/2002	RJM		
09/08/2003	RJM		
12/01/2005	RJM		
02/08/2016	PJJ		
01/03/2019	PJJ		
1/06/2022	PJJ		

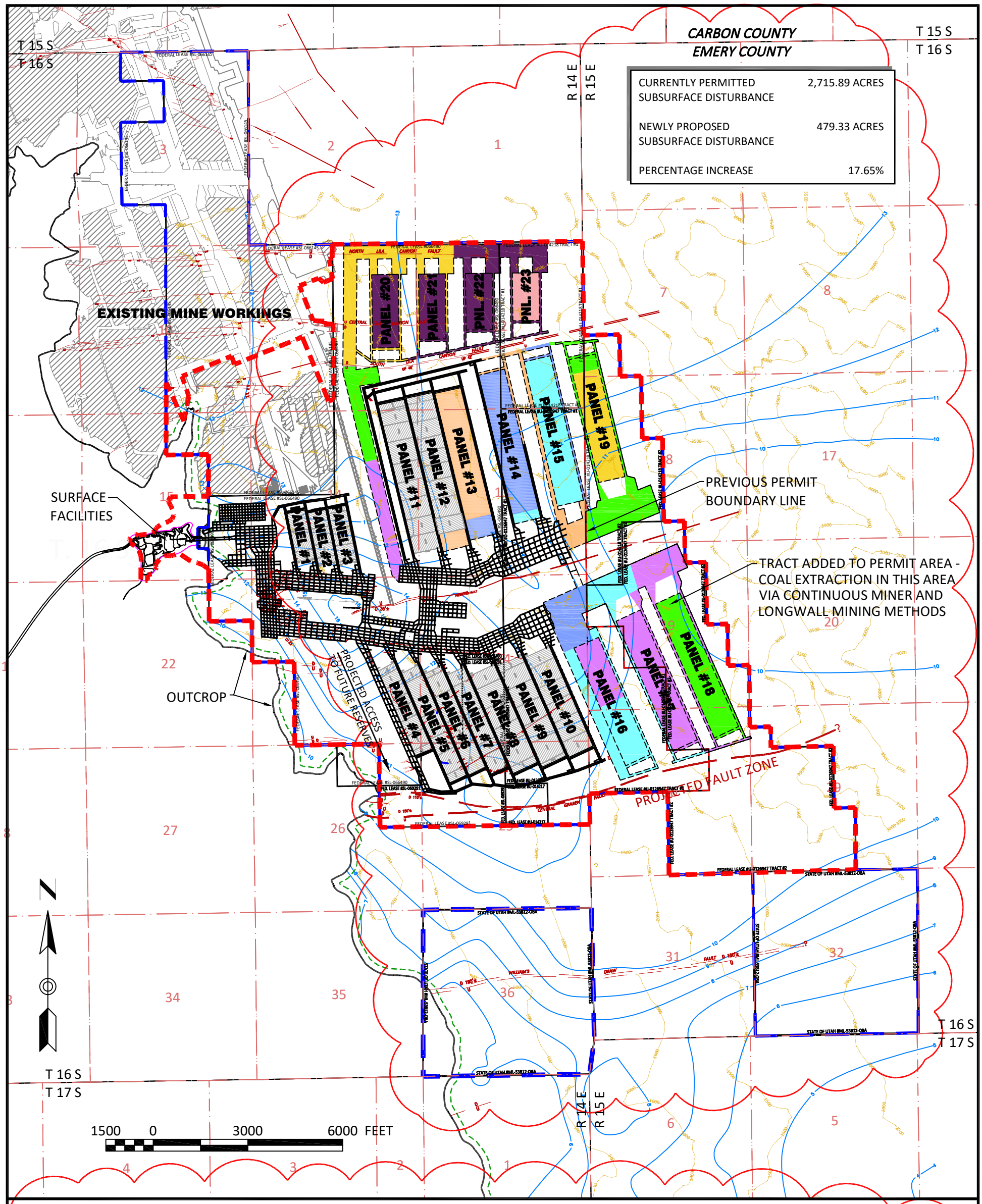
COAL OWNERSHIP

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 4,000'
ORIGINAL DATE: MARCH 1998

PLATE 5-4



NOTES:

1. Mine projections are subject to change depending on conditions encountered in the underground mine workings.
2. Actual mine works are shown as of March 1, 2022.
3. Any mine projections depicted in the fringe areas beyond the existing permit area are speculative, and based upon 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.
4. Emery County Coal Resources, Inc. acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.
5. Longwall panels, where permitted, will be reconfigured as needed to prevent unauthorized subsidence beyond the permit area if extended reserves are not acquired in the future.

LEGEND:

- PERMIT AREA :
- LEASE BOUNDARY LINE:
- FAULTS :
- 200' OUTCROP BARRIER :
- SEAM THICKNESS ISOPACHS : (IN FEET)
- COVER (500' INTERVALS) :
- LMU #UTU-73516 :
- EXISTING MINE WORKINGS:

PROJECTED MINING:

- 2022
- 2023
- 2024
- 2025
- 2026
- 2027
- 2028
- 2029

REVISIONS

DATE	BY	DATE	BY
APR. 23, 1998	RJM	JAN. 6, 2019	PJJ
AUG. 28, 2000	BJ	MAR. 22, 2022	PJJ
DEC. 14, 2000	BJ	Aug. 26, 2022	NGN
SEPT. 20, 2002	RJM		
OCT. 15, 2003	RJM		
DEC. 29, 2004	RJM		
JAN. 14, 2005	RJM		
FEB. 8, 2016	PJJ		

MINE MAP WITH PROJECTIONS

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

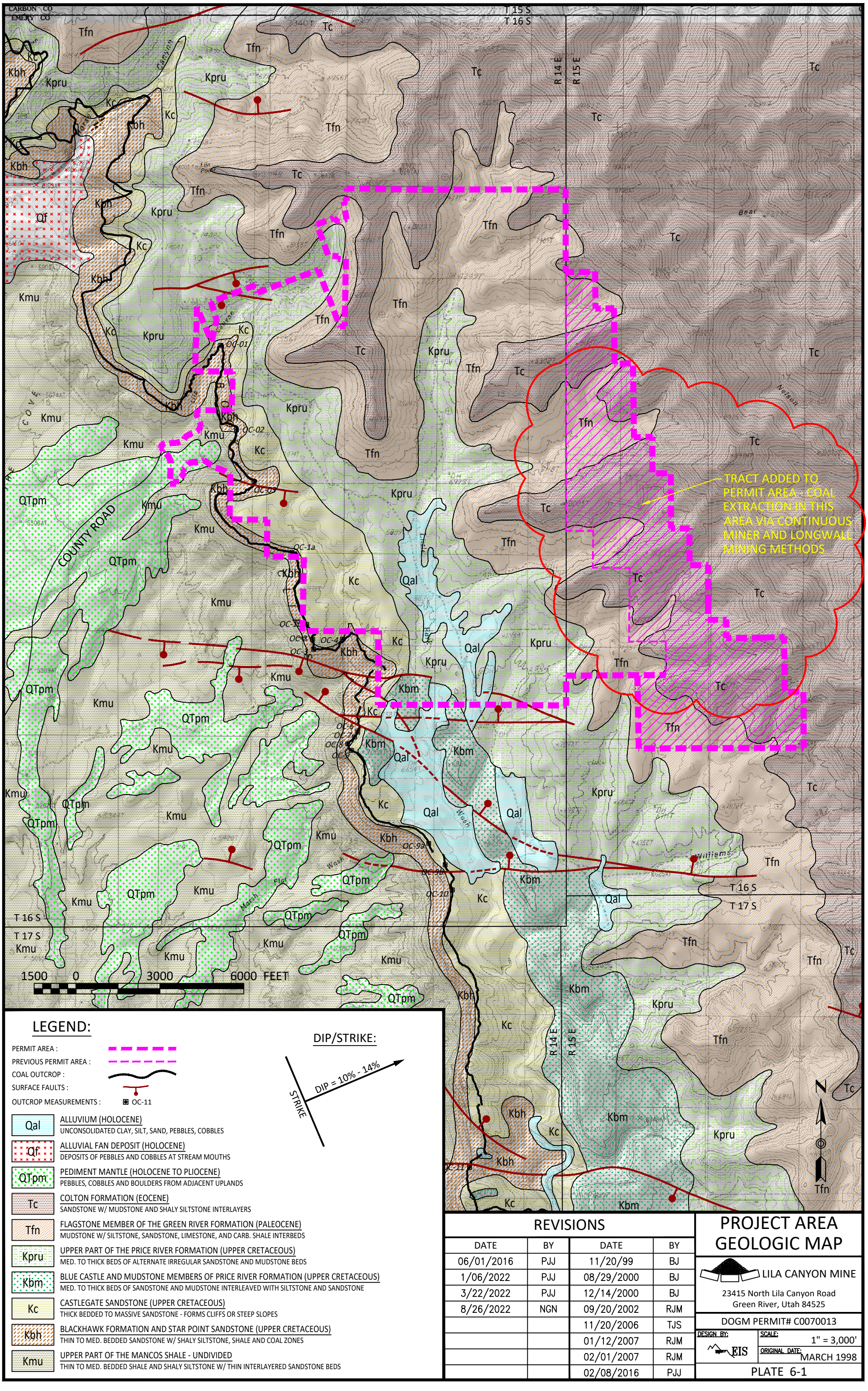
DOGM PERMIT# C0070013

DESIGN BY: UEI

SCALE: 1" = 3,000'

ORIGINAL DATE: JAN. 1999

PLATE 5-5



LEGEND:

PERMIT AREA :
PREVIOUS PERMIT AREA :
COAL OUTCROP :
SURFACE FAULTS :
OUTCROP MEASUREMENTS : OC-11

Qal — ALLUVIUM (HOLOCENE)
UNCONSOLIDATED CLAY, SILT, SAND, PEBBLES, COBBLES

Qf — ALLUVIAL FAN DEPOSIT (HOLOCENE)
DEPOSITS OF PEBBLES AND COBBLES AT STREAM MOUTHS

QTpm — PEDIMENT MANTLE (HOLOCENE TO PLIOCENE)
PEBBLES, COBBLES AND BOULDERS FROM ADJACENT UPLANDS

Tc — COLTON FORMATION (EOCENE)
SANDSTONE W/ MUDSTONE AND SHALY SILTSTONE INTERLAYERS

Tfn — FLAGSTONE MEMBER OF THE GREEN RIVER FORMATION (PALEOCENE)
MUDSTONE W/ SILTSTONE, SANDSTONE, LIMESTONE, AND CARB. SHALE INTERBEDS

Kpru — UPPER PART OF THE PRICE RIVER FORMATION (UPPER CRETACEOUS)
MED. TO THICK BEDS OF ALTERNATE IRREGULAR SANDSTONE AND MUDSTONE BEDS

Kbm — BLUE CASTLE AND MUDSTONE MEMBERS OF PRICE RIVER FORMATION (UPPER CRETACEOUS)
MED. TO THICK BEDS OF SANDSTONE AND MUDSTONE INTERLEAVED WITH SILTSTONE AND SANDSTONE

Kc — CASTLEGATE SANDSTONE (UPPER CRETACEOUS)
THICK BEDDED TO MASSIVE SANDSTONE - FORMS CLIFFS OR STEEP SLOPES

Kbh — BLACKHAWK FORMATION AND STAR POINT SANDSTONE (UPPER CRETACEOUS)
THIN TO MED. BEDDED SANDSTONE W/ SHALY SILTSTONE, SHALE AND COAL ZONES

Kmu — UPPER PART OF THE MANCOS SHALE - UNDIVIDED
THIN TO MED. BEDDED SHALE AND SHALY SILTSTONE W/ THIN INTERLAYERED SANDSTONE BEDS

DIP/STRIKE:

DIP = 10% - 14%
STRIKE

REVISIONS

DATE	BY	DATE	BY
06/01/2016	PJJ	11/20/99	BJ
1/06/2022	PJJ	08/29/2000	BJ
3/22/2022	PJJ	12/14/2000	BJ
8/26/2022	NGN	09/20/2002	RJM
		11/20/2006	TJS
		01/12/2007	RJM
		02/01/2007	RJM
		02/08/2016	PJJ

PROJECT AREA GEOLOGIC MAP

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 3,000'
ORIGINAL DATE: MARCH 1998

PLATE 6-1

T 15 S
T 16 S
T 16 S
T 17 S
R 14 E
R 15 E

NORTH LILA CANYON FAULT
MIDDLE LILA CANYON FAULT
SOUTH LILA CANYON FAULT
SUNNYSIDE FAULT
ENTRY FAULT
CENTRAL GRABEN FAULT
PROJECTED FAULT ZONE
WILLIAMS DRAW FAULT
SOUTH BOUNDARY FAULT

DESOLATION CANYON WILDERNESS

TRACT ADDED TO PERMIT AREA - COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS

OUTCROP

S-1 EL. = 6956' 10.2' COAL = 6000'
S-2 EL. = 6825' 11.5' COAL = 5851'
S-3 EL. = 7070' 13.5' COAL = 5503'
S-4 EL. = 6647' 9.6' COAL = 5624'
S-5 EL. = 6152' 7.3' COAL = 5939'
S-6 EL. = 6380' 5.0' COAL = 6185'
S-7 EL. = 6282' 6.8' COAL = 6115'
S-8 EL. = 6480' 7.3' COAL = 5603'
S-9 EL. = 6345' 3.9' COAL = 5196'
S-10 EL. = 6530' 4.3' COAL = 5070'
S-11 EL. = 6558' 7.7' COAL = 5689'
S-12 EL. = 6597' 8.2' COAL = 5679'
S-13 EL. = 6715' 6.1' COAL = 5194'
S-14 EL. = 6630' 6.3' COAL = 5233'
S-15 EL. = 6668' 11.2' COAL = 5733'
S-16 EL. = 6850' 10.9' COAL = 5283'
S-17 EL. = 7028' 13.6' COAL = 5322'
S-18 EL. = 7105' 13.5' COAL = 5220'
S-19 EL. = 7237' 13.6' COAL = 5176'
S-20 EL. = 6957' 13.2' COAL = 5592'
S-21 EL. = 6782' 13.1' COAL = 5705'
S-22 EL. = 6720' 11.0' COAL = 5301'
S-23 EL. = 6710' 11.0' COAL = 5125'
S-24 EL. = 6429.45' 6.6' COAL = 6291'
S-25 EL. = 6497.42' 4.9' COAL = 6334'
S-26 EL. = 6470.86' 6.1' COAL = 6164'
S-27 EL. = 6309.52' 8.2' COAL = 6060'
S-28 EL. = 6203.46' 6.5' COAL = 6084'
S-29 EL. = 6735.82' 7.1' COAL = 5880'
S-31 EL. = 354.34' 7.2' COAL = 5896'
IPA #1 EL. = 7040.8' 14.4' COAL = 5379'
IPA #2 EL. = 6875.8' HT =10.3' COAL = 5805'
IPA #3 EL. = 6820.3' 11.0' COAL = 5764'

OC-01 OC-02 OC-03 OC-1a OC-1b OC-2 OC-3 OC-4 OC-5 OC-6 OC-7 OC-8 OC-9 OC-9a OC-9b OC-10 OC-11

46k VOLTS
COUNTY ROAD
SOUTHERN PACIFIC RAILROAD
TO GRAND JUNCTION

2000 0 4000 8000 FEET

LEGEND:

PERMIT AREA :
PREVIOUS PERMIT AREA:
COAL OUTCROP :
FAULTS :
OUTCROP MEASUREMENTS : OC-11
LMU AREA :
WILDERNESS AREA :
DRILL HOLES : S-28
EPHEMERAL STREAMS :

DIP/STRIKE:

DIP = 10% - 14%
STRIKE

N

REVISIONS

DATE	BY	DATE	BY
11/20/1999	BJ	3/22/2022	PJJ
08/29/2000	BJ	8/26/2022	NGN
12/14/2000	BJ		
APR. 19, 2002	RJM		
SEPT. 20,2002	RJM		
DEC. 14,2004	RJM		
FEB. 8, 2016	PJJ		
JAN. 6, 2022	PJJ		

GENERAL GEOLOGY

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: BLACKHAWK ENG.
SCALE: 1" = 4,000'
ORIGINAL DATE: JAN. 1998

PLATE 6-2

T. 15 S.
T. 16 S.

CARBON COUNTY
EMERY COUNTY

R. 14 E.
R. 15 E.

T. 15 S.
T. 16 S.

R. 14 E.
R. 15 E.

NORTH LILA CANYON FAULT

CENTRAL LILA CANYON FAULT

SOUTH LILA CANYON FAULT

EXISTING MINE WORKINGS

OC-01
12.30'

OC-02
12.30'

OC-03
12.30'

OC-1a
10.20'

OC-1b
9.30'

OC-2
10.30'

OC-3
8.80'

OC-4
10.80'

OC-3a
10.30'

OC-6
9.20'

OC-7
9.20'

OC-8
5.00'

OC-9
4.30'

OC-9a
8.40'

OC-9b
5.00'

OC-10
5.50'

OC-11
5.90'

S-1
EL. = 6956'
12.08'
COAL = 5000'

S-2
EL. = 6825'
11.50'
COAL = 5851'

S-3
EL. = 7070'
13.50'
COAL = 5503'

S-4
EL. = 6624'
10.67'
COAL = 5624'

S-5
EL. = 6152'
7.09'
COAL = 5939'

S-6
EL. = 6380'
5.00'
COAL = 6185'

S-7
EL. = 6282'
6.75'
COAL = 6115'

S-8
EL. = 6480'
7.25'
COAL = 5603'

S-9
EL. = 6345'
3.84'
COAL = 5196'

S-10
EL. = 6530'
4.25'
COAL = 5070'

S-11
EL. = 6558'
7.75'
COAL = 5689'

S-12
EL. = 6597'
8.25'
COAL = 5679'

S-13
EL. = 6715'
6.09'
COAL = 5194'

S-14
EL. = 6630'
6.33'
COAL = 5233'

S-15
EL. = 6668'
11.25'
COAL = 5733'

S-16
EL. = 6850'
11.50'
COAL = 5283'

S-17
EL. = 7026'
13.58'
COAL = 5322'

S-18
EL. = 7105'
13.50'
COAL = 5220'

S-19
EL. = 7127'
13.50'
COAL = 5176'

S-20
EL. = 6967'
13.25'
COAL = 5592'

S-21
EL. = 6782'
13.17'
COAL = 5705'

S-22
EL. = 6720'
11.33'
COAL = 5301'

S-23
EL. = 6710'
11.00'
COAL = 5198'

S-24
EL. = 6629.45'
6.30'
COAL = 6291'

S-25
EL. = 6497.42'
4.90'
COAL = 6334'

S-26
EL. = 6470.86'
6.10'
COAL = 6164'

S-27
EL. = 6309.52'
8.19'
COAL = 6060'

S-28
EL. = 6203.46'
6.50'
COAL = 6084'

S-29
EL. = 6735.82'
7.10'
COAL = 5880'

S-30
EL. = 6730'
8.50'
COAL = 5881'

S-31
EL. = 354.34'
7.20'
COAL = 5896'

S-32
EL. = 6567'
6.60'
COAL = 5629'

IPA #1
EL. = 7040.8'
15.00'
COAL = 5379'

IPA #2
EL. = 6875.8'
10.00'
COAL = 5805'

IPA #3
EL. = 6820.3'
8.80'
COAL = 5764'

PROJECTED FAULT ZONE

CENTRAL GRABEN FAULT

WILLIAM'S DRAW FAULT

SOUTH BOUNDARY FAULT

PROJECTED FAULT

TRACT ADDED TO PERMIT AREA - COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS

PREVIOUS PERMIT BOUNDARY LINE

T. 16 S.
T. 17 S.

T. 16 S.
T. 17 S.

R. 14 E.
R. 15 E.

LEGEND:

- PERMIT AREA BOUNDARY:
- LMU BOUNDARY:
- COAL OUTCROP:
- FAULTS: U / D
- COVER LINES: 5000'
- COAL ISOPACHS: 10'
- OUTCROP MEASUREMENTS: OC-11 5.90'
- SURFACE DRILL HOLES: S-5 EL. = 6152' 7.09' COAL = 5939'

DIP:

DIP = 10% - 14%

STRIKE

REVISION DATE:

DATE:	BY:	DATE:	BY:
8/29/2000	BJ	Aug. 26, 2022	NGN
12/14/2000	BJ		
April 19, 2002	RJM		
Sept. 30, 2002	RJM		
Sept. 30, 2002	RJM		
Jan. 6, 2022	PJJ		
Mar. 22, 2022	PJJ		

N

1000' 0' 2000' 4000'

LILA CANYON MINE

COAL THICKNESS ISOPACHS

DATE:	DESIGNED BY:
JANUARY 1998	BLACKHAWK ENG.
SCALE: AS SHOWN	PLATE #: 6-3

CARBON COUNTY
EMERY COUNTY

T. 15 S.
T. 16 S.

R. 14 E.
R. 15 E.

NORTH LILA CANYON FAULT

CENTRAL LILA CANYON FAULT

SOUTH LILA CANYON FAULT

EXISTING MINE WORKINGS

OC-01
12.30'

OC-02
12.30'

OC-03
12.30'

OC-1a
10.20'

OC-1b
9.30'

OC-2
10.30'

OC-3
8.80'

OC-3a
10.30'

OC-4
10.80'

OC-6
9.20'

OC-7
9.20'

OC-8
5.00'

OC-9
4.30'

OC-9a
8.40'

OC-9b
5.00'

OC-10
6.50'

OC-11
5.90'

S-1
EL. = 6956'
17.08'
COAL = 6000'

S-2
EL. = 6825'
11.50'
COAL = 5851'

S-3
EL. = 7070'
13.50'
COAL = 5503'

S-4
EL. = 6647'
10.67'
COAL = 5624'

S-5
EL. = 6152'
7.09'
COAL = 5939'

S-6
EL. = 6380'
5.00'
COAL = 6185'

S-7
EL. = 6282'
6.75'
COAL = 6115'

S-8
EL. = 6480'
7.25'
COAL = 5603'

S-9
EL. = 6345'
3.84'
COAL = 5196'

S-10
EL. = 6530'
4.25'
COAL = 5070'

S-11
EL. = 6558'
7.75'
COAL = 5689'

S-12
EL. = 6397'
8.25'
COAL = 5679'

S-13
EL. = 6715'
6.09'
COAL = 5194'

S-14
EL. = 6630'
6.33'
COAL = 5233'

S-15
EL. = 6668'
11.25'
COAL = 5733'

S-16
EL. = 6850'
11.50'
COAL = 5283'

S-17
EL. = 7028'
13.58'
COAL = 5322'

S-18
EL. = 7105'
13.84'
COAL = 5220'

S-19
EL. = 7237'
14.50'
COAL = 5176'

S-20
EL. = 6957'
13.25'
COAL = 5592'

S-21
EL. = 6782'
13.17'
COAL = 5705'

S-22
EL. = 6720'
11.33'
COAL = 5301'

S-23
EL. = 6710'
11.00'
COAL = 5126'

S-24
EL. = 6429.45'
6.30'
COAL = 6291'

S-25
EL. = 6497.42'
4.90'
COAL = 6334'

S-26
EL. = 6470.86'
6.10'
COAL = 6164'

S-27
EL. = 6309.52'
8.19'
COAL = 6060'

S-28
EL. = 6203.46'
6.50'
COAL = 6084'

S-29
EL. = 6735.82'
7.10'
COAL = 5880'

S-30
EL. = 6730'
8.50'
COAL = 5881'

S-31
EL. = 354.34'
7.20'
COAL = 5896'

S-32
EL. = 6567'
6.60'
COAL = 5629'

IPA #1
EL. = 7040.8'
15.00'
COAL = 5379'

IPA #2
EL. = 6875.6'
10.00'
COAL = 5805'

IPA #3
EL. = 6820.3'
9.80'
COAL = 5764'

PROJECTED FAULT ZONE

PROJECTED FAULT

CENTRAL GRABEN FAULT

WILLIAM'S DRAW FAULT

SOUTH BOUNDARY FAULT

FAULT

COAL EXTRACTION VIA CONTINUOUS MINER (FIRST MINING) ONLY - A FUTURE PERMIT AMENDMENT WILL BE SUBMITTED TO AUTHORIZE LONGWALL MINING IN THIS AREA

PREVIOUS PERMIT BOUNDARY LINE

TYPICAL PROJECTED COAL OUTCROP

T. 16 S.
T. 17 S.

R. 14 E.
R. 15 E.

LEGEND:

- PERMIT AREA BOUNDARY:
- LMU BOUNDARY:
- COAL OUTCROP:
- FAULTS: U / D
- COVER LINES:
- SEAM STRUCTURE ISOPACHS:
- OUTCROP MEASUREMENTS: OC-11
- SURFACE DRILL HOLES: S-5
- EPHEMERAL STREAMS:

DIP:

STRIKE — DIP = 10% - 14%

REVISION DATE:

DATE:	BY:	DATE:	BY:
8/29/2000	BJ	Mar. 26, 2022	NGN
12/14/2000	BJ		
April 19, 2002	RJM		
Sept. 30, 2002	RJM		
Feb. 8, 2016	RJM		
Jan. 6, 2022	PJJ		
Mar. 22, 2022	PJJ		

N

1000' 0' 2000' 4000'

LILA CANYON MINE

COVER AND STRUCTURE MAP

DATE:	DESIGNED BY:
JANUARY 1998	BLACKHAWK ENG.
SCALE: AS SHOWN	PLATE #: 6-4

R 14 E
R 15 E

T 16 S
T 17 S

NORTH LILA CANYON FAULT
CENTRAL LILA CANYON FAULT
SOUTH LILA CANYON FAULT
PROJECTED FAULT ZONE
CENTRAL GRABEN FAULT
NO RECOVERY
FOREST OIL COMPANY
LOWER SEAM NOT DEPOSITED

OC-01 OC-02 OC-03 OC-1a OC-1b OC-2 OC-3 OC-3a OC-4 OC-6 OC-7 OC-8 OC-9 OC-9a OC-9b OC-10 OC-11

S-1 S-2 S-3 S-4 S-5 S-6 S-7 S-8 S-9 S-10 S-11 S-12 S-13 S-14 S-15 S-16 S-17 S-18 S-19 S-20 S-21 S-22 S-23 S-24 S-25 S-26 S-27 S-28 S-29 S-30 S-31 S-33 IPA#2 S-34 IPA#3 S-32 IPA#1 IPA #1 IPA #2 IPA #3

LEGEND:

COAL OUTCROP:
OUTCROP MEASUREMENTS: OC-11
FAULTS: U / D
LMU AREA:

LEGEND:

COAL:
BONE COAL:
CARBONACEOUS SHALE:
MUDSTONE:
SILTSTONE:
SANDSTONE:
LAMINATED SILTSTONE/SANDSTONE:

DIP:

STRIKE
DIP = 10% - 14%

REVISION DATE:

DATE:	BY:	DATE:	BY:
8/29/2000	BJ		
9/30/2002	RJM		
1/06/2022	PJJ		
3/22/2022	PJJ		
8/10/2022	RSA		

N

750' 0' 1500' 3000'

LILA CANYON MINE

COAL SECTIONS

DATE:	DESIGNED BY:
FEBRUARY 1998	BLACKHAWK ENG.
SCALE: AS SHOWN	PLATE #: 6-5

LILA CANYON MINE

PERMIT AREA HYDROLOGY

T 15 S / T 16 S / T 16 S / T 17 S

R 13 E / R 14 E — R 14 E / R 15 E — R 13 E / R 14 E

CARBON COUNTY RAILROAD

SOUTHERN PACIFIC RAILROAD

TO SALT LAKE CITY

TO GRAND JUNCTION

46K Volts

County Road

124

6

Middle Canyon

Horse Canyon

North Fork

South Fork

Grassy Wash

Lila Wash

Right Fork Lila Wash

Stinky Spring Wash

Marsh Flat Wash

Little Park Wash

IPA #1 Wash

IPA #2 Wash

Nelson Canyon

Bear Canyon

Pine Spring Wash

Northline Wash

Left Fork Williams Draw

Middle Fork Williams Draw

Right Fork Williams Draw

Horse Canyon Well

MDC Well

Alkali Pond 91-2618

Marsing Bros. Reservoir 91-2621

Powerline Pond 91-2620

No Name (Filled In) 91-2619

Harve Marsing Reservoir 91-2617

Cove Reservoir #1 91-2646

Big Pond 91-2665

2008 Seep Inventory Area

SUNNYSIDE FAULT

NORTH LILA CANYON FAULT

MIDDLE LILA CANYON FAULT

SOUTH LILA CANYON FAULT

ENTRY FAULT

CENTRAL GRABEN FAULT ZONE

WILLIAMS DRAW FAULT

SOUTH BOUNDARY FAULT

EXPLORATION ENTRY

LAST OBSERVED WATER ELEVATION 5870

ESTIMATED FACE ELEVATION 5550

MAIN SLOPE

ROTARY DUMP

WATER LEVEL - 5800

2DIP

IPA #1 EL = 7034 14.4' WATER LEVEL - 5904

IPA #2 EL = 6865 10.3' WATER LEVEL - 5962

IPA #3 EL = 6810 11.0' WATER LEVEL - 5975

S-32 EL = 6567 6.6 WATER LEVEL - 5836

COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS

Coordinates: Utah State Plane North, NAD 83

1000' 0' 2000' 4000'

LEGEND:

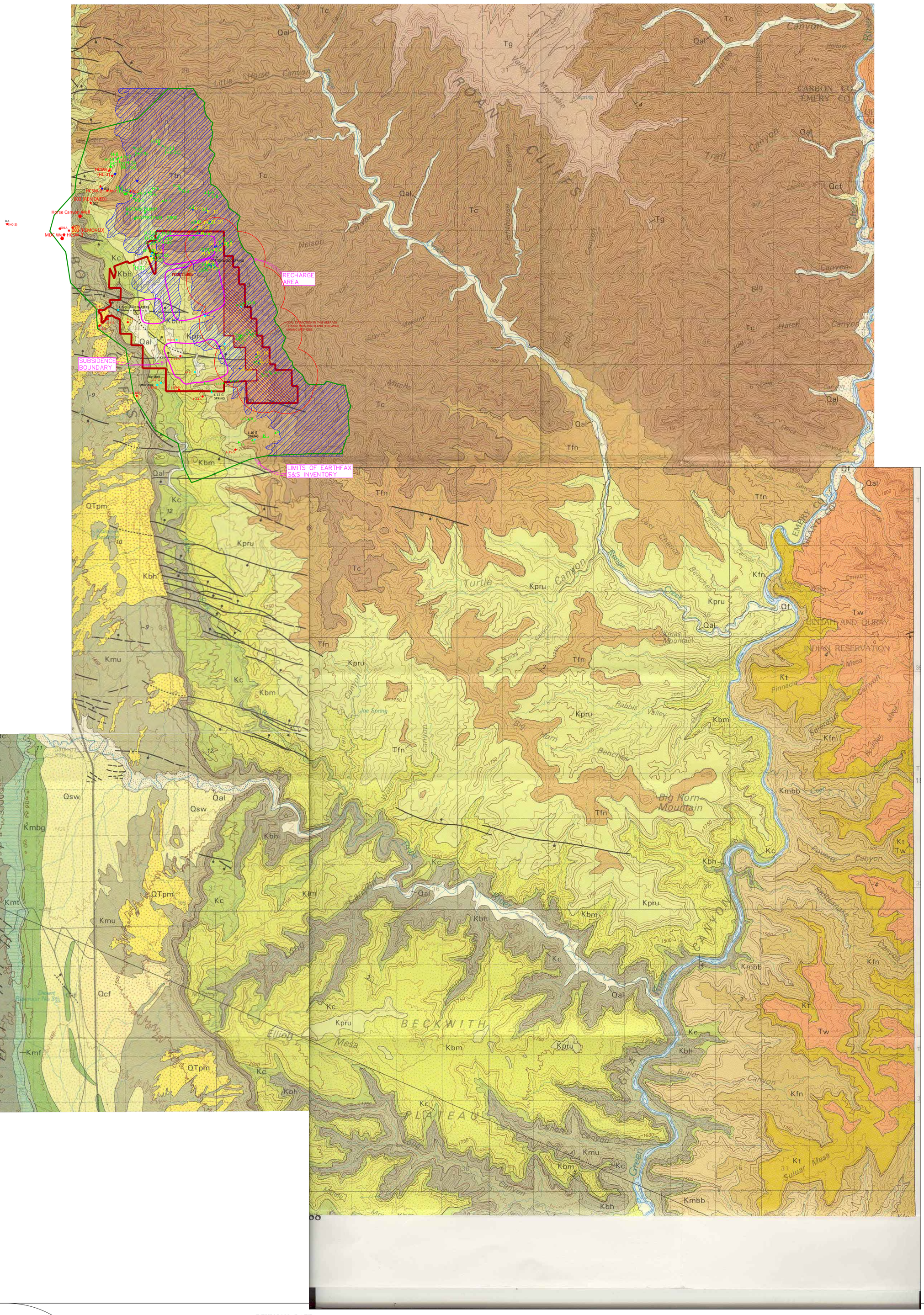
- SEEP AND SPRING MONITORING LOCATIONS: SUWA ● EL-13; Kaiser ▲ 12; South Lease ▲ 12; JBR/EF ▲ 12
- SURFACE WATER MONITORING LOCATIONS:
- IN-MINE MONITORING LOCATIONS:
- WELLS/PIEZOMETERS
- NATURAL DRAINAGE:
- COAL OUTCROP:
- PIEZOMETRIC SURFACE:
- STRUCTURE LINES:
- FAULTS: U / D
- PERMIT AREA:
- STOCK POND WATER RIGHT 91-2646
- ECCR WATER RIGHT: 91-810
- WATER RIGHT NOT ECCR: 91-2535
- UNDERGROUND WATER RIGHT 91-48
- OUTCROP MEASUREMENT oc-10

REVISION DATE:

DATE:	BY:	DATE:	BY:
July 1999	WJ		
November 1999	BHE	December 2006	PJJ
March 2000	BHE	Jan. 12 2007 (07-002)	RJM
AUG 2000	BJ	Feb. 19 2007 (07-002)	RJM
DEC 2000	BJ	April 2011	TJS
April 2002	RJM	January 2022	PJJ
September 2002	RJM	March 2022	TJS/PJJ
November 2006	TJS	August 2022	RSA

DATE: MAY 1998 — DESIGNED BY: BLACKHAWK ENG.

SCALE: AS SHOWN — PLATE #: 7-1



LEGEND

- Qal — Alluvium
- Qcl — Colluvium
- Qf — Alluvial fan deposit
- Qcf — Coalesced alluvial fan deposit
- Qsw — Slope wash
- QTpm — Pediment mantle
- Qt — Terrace deposit
- Tg — Green River Formation
- Tc — Colton Formation
- Tw — Wasatch Formation
- Tfn — Flagstaff Member of Green River Formation and North Horn Formation
- Kt — Tuscher Formation
- Kfn — Farrer and Neslen Formations
- Kmbb — Buck Tongue of Mancos Shale
- Kpru — Upper Part of Price River Formation
- Kbm — Bluecastle Sandstone Member
- Kc — Castlegate Sandstone
- Kbh — Blackhawk Formation and Star
- Kmub — Upper part of Blue Gate Member
- Kme — Emery Sandstone Member
- Kmeu — Upper sandstone unit
- Kmem — Middle shale unit
- Kmel — Lower sandstone unit
- Kmbg — Blue Gate Member
- Kmbg — Garley Canyon Sandstone Member
- Kmf — Ferron Sandstone Member
- Kmt — Tununk Member
- Kmu — Upper part of Mancos Shale, undivided
- Kmf — Ferron Sandstone Member
- Kmt — Tununk Member
- Jm — Morrison Formation
- Jmbb — Brushy Basin Member
- Jms — Salt Wash Sandstone Member
- Js — Summerville Formation
- Jcu — Curtis Formation
- Je — Entrada Sandstone
- Jc — Carmel Formation
- Jfn — Navajo Sandstone
- Trk — Kayenta Formation

WATER MONITORING OLD/CURRENT

- Horse Canyon Monitoring
- Underground Horse Canyon Monitoring
- Baseline Springs
- Lila Canyon Ground Water Monitoring
- Lila Canyon Surface Monitoring
- Major Recharge Area
- EarthFax S&S Limits
- SUWA Seeps

REVISION DATE:

DATE:	BY:	DATE:	BY:
Nov. 2006	TJS		
Jan. 2022	PJJ		
Mar. 2022	PJJ		
Aug. 2022	RSA		

N

1000' 0' 2000' 4000'

LILA CANYON MINE

PERMIT HYDROLOGY / GEOLOGY MAP

DATE:	DESIGNED BY:
NOVEMBER 2002	
SCALE: AS SHOWN	PLATE #: 7-1A

COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS

PROJECTED FAULT ZONE

LEGEND:

PERMIT AREA :
EPHEMERAL CHANNEL :
COAL OUTCROP :
FAULTS :
NON-ECCR WATER RIGHT : 91-557
ECCR WATER RIGHT : 91-810
RESERVOIR / STREAM :
SPRING SOURCE :
REACH OF CREEK :
UNDERGROUND SOURCE :

NOTE: MOST FAULT LINES NOT SHOWN FOR CLARITY.

REVISION DATE:

DATE:	BY:	DATE:	BY:
November 1999	BHE	November 2006	RJM
AUGUST 2000	BHE	February 2016	PJJ
DECEMBER 2000	BJ	September 2021	PJJ
September 2002	RJM	January 2022	PJJ
November 2003	RJM	March 2022	PJJ
January 2005	RJM	August 2022	RSA
November 2006	TJS		

1000' 0' 2000' 4000'

LILA CANYON MINE

WATER RIGHTS

DATE:	DESIGNED BY:
MAY 1998	BLACKHAWK ENG.
SCALE: AS SHOWN	PLATE #: 7-3

R 13 E
R 14 E
R 14 E
R 15 E
T 15 S
T 16 S
T 16 S
T 17 S
CARBON COUNTY RAILROAD
SOUTHERN PACIFIC RAILROAD
TO SALT LAKE CITY
TO GRAND JUNCTION
46K Volts
County Road
Middle Canyon
Horse Canyon
North Fork
South Fork
Bear Canyon
Lila Canyon
Lila Wash
Grassy Wash
Right Fork Lila Wash
Little Park Wash
IPA #1 Wash
Pine Spring Wash
Nelson Canyon
Stinky Spring Wash
Marsh Flat Wash
Noname Wash
Left Fork Williams Draw
Middle Fork Williams Draw
Right Fork Williams Draw
B-1 (HC-2)
RG-1
RG-2
L-1-S
L-2-S
L-3-S
L-4-S
L-5-C (MINE WATER)
ROCK SLOPES
L-11-C
L-12-A-C
L-12-C SPRING
L-13-S
L-14-S
L-16-C
L-17-C
L-18-C
L-19-S
L-20-C QUAKER SPRING
L-7-C COTTONWOOD SPRING
L-8-C SPRING
L-9-C PINE SPRING
L-10-C SPRING
LS-002
IPA #1 EL = 7034 14.4' WATER LEVEL - 7904
IPA #2 EL = 6865 10.3' WATER LEVEL - 6962
IPA #3 EL = 6810 11.0' WATER LEVEL - 5975
PERMIT AREA
PREVIOUS PERMIT BOUNDARY LINE
COAL EXTRACTION IN THIS AREA VIA CONTINUOUS MINER AND LONGWALL MINING METHODS

LEGEND:

WATER MONITORING:

	Active	Suspended
HORSE CANYON MONITORING:	★	★
LILA CANYON SURFACE MONITORING:	●	●
LILA CANYON GROUNDWATER MONITORING:	●	●
LILA CANYON CREST GAUGE MONITORING:	■	■
LILA CANYON SEEP LOCATIONS:	▲	
LILA CANYON RAIN GAUGE LOCATIONS:	▲	▲

REVISION DATE:

DATE:	BY:	DATE:	BY:
July 1999	WJ		
November 1999	BHE	June 2011	TJS
March 2000	BHE	October 2017	PJJ
August 2000	BJ	January 2022	PJJ
December 2000	BJ	March 2022	PJJ
July 2001	BJ	August 2022	RSA
September 2002	RJM		
November 2006	TJS		

N

1000' 0' 2000' 4000'

LILA CANYON MINE

WATER MONITORING LOCATIONS

DATE:	DESIGNED BY:
MAY 1998	BLACKHAWK ENG.
SCALE: AS SHOWN	PLATE #: 7-4