C/025/005 Incoming

#3895

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Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, Utah 84720
Phone (435) 867-5331 • Fax (435) 867-1192

August 26, 2011

Daron R. Haddock
Coal Program Manager
Oil, Gas & Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801

Subject: **Mine and Reclamation Plan-Deficiencies Submittal Coal Hollow Project, Kane County, Utah, C/025/0005**

Dear Mr. Haddock,

Alton Coal Development, LLC is pleased to provide this submittal addressing the deficiencies requested in Task List 3862, Task that resulted from the drainage control plan submitted June 20, 2011.

The following is an overview of the contents and a brief description of how each deficiency is addressed:

- **[R645-301.732.300]** – Drawing 5-3 has been updated to reflect the temporary ditch to direct the flow of undisturbed runoff into LRC along the upper primary haul road. Work will begin shortly to remove the topsoil from the natural ephemeral channel for DD-2A. Drawings in this submission reflect this path.

- **[R645-301-512.100]** – An addition of drawing 5-3A Facilities and Structures – Culverts has been added to the MRP. Drawing 5-3A shows the locations of all the permanent culverts in addition to the flow paths of surface runoff. Corrections have been made to the culvert sizes.

File in:
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☐ Shelf
☒ Expandable
Date Folder 082911 C/025005
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[R645-301.742.220] – Drawing 5-20 has been removed from the previous submittal and additional text has not been added to this submission. The original intent of the perforated pipe collection system to address seepage from the natural channel of Lower Robinson Creek flowing across disturbed ground and off the property has passed. With the overburden removal of pit 3 currently in progress, the source of the seepage has diminished. This ground water flow will be managed as flow from the highwall or more preferably within a dewatering trench up gradient of the pit. This will continue as the pits progress to the East. Once the furthest East pit is mined and backfilled, the ground water will reestablish. The MRP Chapter 7 section 728, *Diminution of down-gradient groundwater resources* currently addresses the future of the seepage:

> "It should be noted that the proposed Coal Hollow Mine plan calls for the permanent diversion of a reach of the Lower Robinson Creek stream channel approximately 2,000 feet in length in the southeast ¼ of Section 19, T39S, R5W. Details of the proposed diversion are given in Chapter 5, Section 527.220 of this MRP. If this action results in diminution of the meager discharge of surface water in the drainage below the planned diversion, where required a suitable mitigation for this potential impact will be designed and implemented in consultation with the Division of Oil, Gas and Mining."

- **[645-301.733.100]** – A comprehensive search of the MRP was made looking for statements to the effect "all ponds are designed for total containment". None were found. The following wording used throughout the permit in relation to pond design and containment is technically correct:

  "Five impoundments are proposed to control storm water runoff and sediment from disturbed areas. Each impoundment is designed to contain the run off from a 100 year, 24 hour duration storm event."

  "Open channel spillway details for impoundments 3 and 4 are provided in Drawing 5-32. These spillways are designed for emergencies and are not expected to be used during normal operations."

  "Impoundments 3 and 4 will be constructed with open channel spillways. These spillways are designed to discharge a 6 hour duration, 100 year storm event even though they are not expected to be used."

  "The sedimentation ponds are designed to provide detention for a 100 year, 24 hour duration storm event."

  "Impoundments 3 and 4 will be constructed with open channel spillways. These spillways are designed to discharge a 24 hour duration, 100 year storm event even though they are not expected to be used during normal operations."

"Each pond will be constructed with an emergency spillway, should the capacities of the ponds ever be exceeded. These spillways will provide a nondestructive route for storm water discharge, though the capacities of the ponds are not expected to be exceeded. The design capacities of the ponds are expected to contain each storm event and therefore will provide sufficient detention time to meet Utah and federal effluent limitations."

"Discharges from the Coal Hollow project are expected to be minimal based on the storm water and runoff controls that are described in R645-301-740. These structures are designed to contain large storm events without discharging runoff."

"Sedimentation impoundments will be constructed to control discharges"

- **[R645-728.320]** – Groundwater quality of the wells completed in the Smirl coal seam (wells Y-36, Y-38, Y-45 and Y-49) in the Coal Hollow Mine area was collected for several years. Eric Petersen of Petersen Hydrologic LLC was employed to evaluate the data available for potential acidity. Results of this investigation are included as Appendix 7-13. It is apparent that no further actions are necessary

Each of the 4 (four) clean copies is organized by chapter, appendix, etc. and is separated by a yellow sheet that will aid in locating where the content belongs in the Mine and Reclamation Plan. Please do not hesitate to contact me if you have any questions.

Sincerely

B. Kirk Nicholes
Environmental Specialist

APPLICATION FOR COAL PERMIT PROCESSING

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

Permittee: Alton Coal Development, LLC
Mine: Coal Hollow **Permit Number:** C/025/0005
Title: Drawing 5-3A Facilities & Structures Culverts
Description, Include reason for application and timing required to implement:
Submitted as results of Deficiency List Task No. 3862

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: _____ 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 four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

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.

B. Kirk Nichols
Print Name

B. Kirk Nichols Resident Agent 8/26/11
Sign Name, Position, Date

Subscribed and sworn to before me this 26th day of August, 2011

Ed Goodwin
Notary Public

ED GOODWIN
NOTARY PUBLIC • STATE OF UTAH
444 SOUTH MAIN SUITE B-2
CEDAR CITY, UTAH 84720
COMM. EXP. 9-7-2011

My commission Expires: 9/7, 2011
Attest: State of Utah } ss:
County of Iron

For Office Use Only:	Assigned Tracking Number:	Received by Oil, Gas & Mining
		RECEIVED AUG 29 2011 DIV. OF OIL, GAS & MINING

Form DOGM- C1 (Revised March 12, 2002)

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

Permittee: Alton Coal Development, LLC
Mine: Coal Hollow **Permit Number:** C/025/0005
Title: Drawing 5-3A Facilities & Structures Culverts

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	Drawing 5-3A Facilities & Structures Culverts, Chapter 5
☐ Add	☒ Replace	☐ Remove	Chapter 5 TOC page v
☐ Add	☐ Replace	☐ Remove	Chapter 7 Appendix 7-13
☐ Add	☐ Replace	☐ Remove	
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Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.

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Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

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Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		In.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0609512-001	LOF-1	0-6	7.3	50.2	1.56	3.6	9.03	2.09	2.20	0.55	0.23
S0609512-002	LOF-1	6-12	8.3	54.4	0.52	1.8	2.63	1.09	0.18	1.57	1.15
S0609512-003	LOF-1	12-24	8.5	54.8	0.42	1.6	1.07	0.59	0.07	2.65	2.91
S0609512-004	LOF-1	24-42	8.7	60.8	0.90	1.5	1.61	0.87	0.14	4.47	4.02
S0609512-005	LOF-1	42-60	8.4	65.4	4.75	1.1	6.45	7.65	0.45	32.7	12.3
S0609512-006	LOF-3	0-4	8.1	47.7	0.82	3.9	5.98	1.58	1.02	0.53	0.27
S0609512-007	LOF-3	4-11	8.3	51.8	0.43	2.9	3.19	0.73	0.27	0.36	0.25
S0609512-008	LOF-3	11-19	8.1	42.7	0.41	2.3	2.86	0.88	0.22	0.44	0.32
S0609512-009	LOF-3	19-33	8.4	53.5	0.71	2.2	1.67	0.89	0.15	4.58	4.05
S0609512-011	RDV-5	0-5	8.1	42.7	0.54	3.6	3.72	0.90	0.36	0.41	0.27
S0609512-012	RDV-5	5-10	8.1	39.3	0.50	3.0	3.98	0.95	0.23	0.30	0.19
S0609512-013	RDV-5	10-25	8.4	32.3	0.37	1.1	2.37	0.89	0.22	0.40	0.31
S0609512-014	RDV-5	25-48	8.8	56.0	0.72	1.7	0.84	0.60	0.11	6.33	7.45
S0609512-015	RDV-5	48-60	9.0	83.6	3.37	1.3	1.26	1.76	0.20	29.5	24.0
S0609512-016	RDV-6	0-6	8.1	27.9	0.52	1.1	2.99	1.06	0.77	0.48	0.34
S0609512-017	RDV-6	6-12	8.3	29.9	0.31	0.7	2.13	0.47	0.14	0.28	0.25
S0609512-018	RDV-6	12-24	8.0	35.4	0.64	2.6	4.52	1.68	0.33	0.36	0.20
S0609512-019	RDV-6	24-34	8.3	29.7	0.40	0.7	2.43	1.35	0.18	0.41	0.30
S0609512-020	RDV-6	34-60	8.5	52.9	0.83	1.8	1.83	2.24	0.19	4.89	3.43
S0609512-021	1YR-8	0-8	8.0	51.5	0.68	5.8	3.68	2.81	0.45	0.33	0.18

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
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Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

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Soil Analysis Report

Talon Resources, Inc.

PO Box 1230

Huntington, UT 84528

Report ID: S0609512001

Project: Talon Resources Soil

Date Received: 9/28/2006

Date Reported: 11/13/2006

Work Order: S0609512

Lab ID	Sample ID	Depths	PE Alkalinity	Sand	Silt	Clay	Texture	Very Fine Sand
		In.	meq/L	%	%	%		%
S0609512-001	LOF-1	0-6	3.76	25.0	39.0	36.0	Clay Loam	20.1
S0609512-002	LOF-1	6-12	3.45	26.0	38.0	36.0	Clay Loam	24.3
S0609512-003	LOF-1	12-24	2.72	18.0	40.0	42.0	Silty Clay	16.5
S0609512-004	LOF-1	24-42	4.08	13.0	41.0	46.0	Silty Clay	11.3
S0609512-005	LOF-1	42-60	1.67	19.0	39.0	42.0	Clay	17.1
S0609512-006	LOF-3	0-4	5.64	32.0	42.0	26.0	Loam	17.5
S0609512-007	LOF-3	4-11	3.55	24.0	48.0	28.0	Clay Loam	15.9
S0609512-008	LOF-3	11-19	2.51	16.0	50.0	34.0	Silty Clay Loam	14.0
S0609512-009	LOF-3	19-33	3.87	17.0	43.0	40.0	Silty Clay	16.1
S0609512-011	RDV-5	0-5	3.97	38.0	44.0	18.0	Loam	22.6
S0609512-012	RDV-5	5-10	4.08	33.0	47.0	20.0	Loam	18.9
S0609512-013	RDV-5	10-25	2.72	54.0	32.0	14.0	Sandy Loam	19.0
S0609512-014	RDV-5	25-48	4.91	16.0	72.0	12.0	Silt Loam	13.4
S0609512-015	RDV-5	48-60	6.06	31.0	47.0	22.0	Loam	26.6
S0609512-016	RDV-6	0-6	3.97	82.0	12.0	6.0	Loamy Sand	21.0
S0609512-017	RDV-6	6-12	2.51	80.0	14.0	6.0	Loamy Sand	18.5
S0609512-018	RDV-6	12-24	4.18	45.0	37.0	18.0	Loam	17.8
S0609512-019	RDV-6	24-34	2.93	69.0	23.0	8.0	Sandy Loam	35.5
S0609512-020	RDV-6	34-60	5.96	19.0	41.0	40.0	Silty Clay	15.5
S0609512-021	1YR-8	0-8	5.54	36.0	34.0	30.0	Clay Loam	19.7

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Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

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Report ID: S0609512001

Project: Talon Resources Soil

Date Received: 9/28/2006

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Work Order: S0609512

Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0609512-001	LOF-1	0-6	22.6			1.99	2.86
S0609512-002	LOF-1	6-12	27.1			<0.02	0.18
S0609512-003	LOF-1	12-24	26.6			0.23	0.93
S0609512-004	LOF-1	24-42	27.1			0.34	<0.01
S0609512-005	LOF-1	42-60	28.3			0.21	0.07
S0609512-006	LOF-3	0-4	20.3			10.6	<0.01
S0609512-007	LOF-3	4-11	20.4			1.07	0.90
S0609512-008	LOF-3	11-19	24.2			0.43	0.56
S0609512-009	LOF-3	19-33	27.2			0.32	0.07
S0609512-011	RDV-5	0-5	25.7			6.14	10.4
S0609512-012	RDV-5	5-10	26.4			<0.02	1.82
S0609512-013	RDV-5	10-25	31.1			0.22	16.4
S0609512-014	RDV-5	25-48	28.0			0.16	1.48
S0609512-015	RDV-5	48-60	26.5			0.22	1.62
S0609512-016	RDV-6	0-6	18.4			1.68	9.41
S0609512-017	RDV-6	6-12	20.6			0.24	0.67
S0609512-018	RDV-6	12-24	28.9			<0.02	0.56
S0609512-019	RDV-6	24-34	29.2			0.07	0.56
S0609512-020	RDV-6	34-60	25.9			0.03	<0.01
S0609512-021	1YR-8	0-8	5.1			3.82	10.9

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor

Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

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Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		In.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0609512-022	1YR-8	8-14	8.1	43.1	0.53	2.1	3.22	1.63	0.34	0.29	0.18
S0609512-023	1YR-8	14-22	8.5	35.8	0.40	1.1	1.77	1.31	0.37	0.53	0.43
S0609512-024	1YR-8	22-45	8.9	37.6	0.44	0.7	0.71	3.05	0.45	0.39	0.28
S0609512-025	1YR-8	45-65	9.0	27.4	0.49	0.4	0.70	3.46	0.41	0.40	0.28
S0609512-026	1YR-8	65-85	8.9	25.9	0.56	0.3	1.24	3.81	0.19	1.03	0.65
S0609512-027	1YR-9A	0-12	9.0	47.0	0.91	4.7	0.98	7.93	0.65	0.62	0.30
S0609512-028	1YR-9A	12-24	9.1	32.8	0.83	1.4	0.44	7.78	0.71	0.46	0.23
S0609512-029	1YR-9A	24-42	9.6	26.4	1.26	0.3	0.76	6.48	0.34	7.06	3.71
S0609512-030	1YR-9A	42-70	9.4	27.7	0.90	0.3	0.63	3.77	0.16	4.73	3.19
S0609512-031	1YR-9A	70-100	8.5	68.6	1.31	0.5	1.72	8.32	0.19	3.31	1.48
S0609512-032	1YR-11	0-5	8.0	36.3	0.48	2.4	2.44	1.84	0.39	0.28	0.19
S0609512-033	1YR-11	5-16	8.2	31.3	0.50	1.7	2.76	1.42	0.36	0.40	0.28
S0609512-034	1YR-11	16-32	8.3	27.9	0.38	0.9	1.89	0.87	0.37	0.26	0.22
S0609512-035	1YR-11	32-48	8.3	27.3	0.41	0.5	1.90	1.06	0.29	0.32	0.26
S0609512-036	1YR-11	48-72	8.6	28.1	0.33	0.3	1.44	0.96	0.12	0.27	0.24
S0609512-037	1YR-11	72-90	8.7	23.9	0.29	0.2	1.37	1.15	0.13	0.39	0.35
S0609512-038	SP-13	0-6	8.5	34.1	0.72	2.7	4.77	2.10	0.90	0.31	0.17
S0609512-039	SP-13	6-12	8.2	43.3	0.52	1.7	2.64	1.72	0.41	0.33	0.22
S0609512-040	SP-13	12-24	8.4	62.3	0.55	2.9	1.67	3.09	0.26	0.35	0.23
S0609512-041	SP-13	24-48	8.5	46.3	0.47	1.2	0.91	3.26	0.12	0.42	0.29

These results apply only to the samples tested.

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Karen Secor, Soil Lab Supervisor

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Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths In.	PE Alkalinity meq/L	Sand %	Silt %	Clay %	Texture	Very Fine Sand %
S0609512-022	1YR-8	8-14	2.93	38.0	32.0	30.0	Clay Loam	17.2
S0609512-023	1YR-8	14-22	2.30	48.0	30.0	22.0	Loam	19.5
S0609512-024	1YR-8	22-45	3.55	42.0	42.0	16.0	Loam	23.9
S0609512-025	1YR-8	45-65	3.66	79.0	13.0	8.0	Loamy Sand	19.8
S0609512-026	1YR-8	65-85	4.18	80.0	12.0	8.0	Loamy Sand	17.9
S0609512-027	1YR-9A	0-12	6.90	60.0	32.0	8.0	Sandy Loam	26.6
S0609512-028	1YR-9A	12-24	7.94	68.0	22.0	10.0	Sandy Loam	22.2
S0609512-029	1YR-9A	24-42	10.6	68.0	22.0	10.0	Sandy Loam	20.4
S0609512-030	1YR-9A	42-70	5.22	69.0	21.0	10.0	Sandy Loam	26.7
S0609512-031	1YR-9A	70-100	2.82	30.0	31.0	39.0	Clay Loam	27.3
S0609512-032	1YR-11	0-5	3.76	72.0	19.0	9.0	Sandy Loam	19.9
S0609512-033	1YR-11	5-16	3.55	69.0	17.0	14.0	Sandy Loam	20.0
S0609512-034	1YR-11	16-32	3.13	72.0	18.0	10.0	Sandy Loam	16.1
S0609512-035	1YR-11	32-48	2.93	79.0	13.0	8.0	Loamy Sand	17.1
S0609512-036	1YR-11	48-72	2.82	78.0	14.0	8.0	Loamy Sand	18.4
S0609512-037	1YR-11	72-90	2.19	89.0	7.0	4.0	Sand	14.1
S0609512-038	SP-13	0-6	5.64	59.0	23.0	18.0	Sandy Loam	15.8
S0609512-039	SP-13	6-12	3.87	23.0	51.0	26.0	Silt Loam	12.7
S0609512-040	SP-13	12-24	3.87	14.0	44.0	42.0	Silty Clay	9.1
S0609512-041	SP-13	24-48	3.55	22.0	46.0	32.0	Clay Loam	9.5

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
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Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

Inter-Mountain Labs
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Your Enviromental Monitoring Partner

Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0609512-022	1YR-8	8-14	16.3			0.05	0.07
S0609512-023	1YR-8	14-22	27.3			0.17	0.21
S0609512-024	1YR-8	22-45	30.8			0.50	2.51
S0609512-025	1YR-8	45-65	19.3			0.27	0.18
S0609512-026	1YR-8	65-85	20.4			0.20	0.10
S0609512-027	1YR-9A	0-12	26.1			4.23	10.0
S0609512-028	1YR-9A	12-24	22.0			0.21	2.02
S0609512-029	1YR-9A	24-42	23.6			0.13	2.22
S0609512-030	1YR-9A	42-70	23.5			0.26	1.88
S0609512-031	1YR-9A	70-100	9.8			0.29	0.82
S0609512-032	1YR-11	0-5	1.4			1.58	8.21
S0609512-033	1YR-11	5-16	4.2			0.13	0.82
S0609512-034	1YR-11	16-32	14.4			0.20	1.53
S0609512-035	1YR-11	32-48	19.6			0.23	0.44
S0609512-036	1YR-11	48-72	21.7			0.12	2.20
S0609512-037	1YR-11	72-90	18.2			0.10	4.93
S0609512-038	SP-13	0-6	19.7			3.78	39.5
S0609512-039	SP-13	6-12	27.9			0.18	3.83
S0609512-040	SP-13	12-24	26.9			0.50	0.70
S0609512-041	SP-13	24-48	32.2			0.46	0.44

These results apply only to the samples tested.

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Karen Secor, Soil Lab Supervisor

Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		In.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0609512-042	SP-13	48-60	8.8	46.1	0.31	1.8	0.53	3.00	0.10	0.67	0.51
S0609512-043	SP-13	60-72	8.9	35.6	1.46	1.2	1.64	8.30	0.14	4.90	2.20
S0609512-044	SP-13	72-84	8.7	33.5	2.20	0.5	2.07	15.5	0.20	7.00	2.36
S0609512-045	SP-16	0-8	8.3	64.5	0.58	4.8	3.08	1.84	0.42	0.49	0.31
S0609512-046	SP-16	8-18	8.2	61.9	0.60	1.9	2.00	2.77	0.28	0.39	0.25
S0609512-047	SP-16	18-36	8.7	50.6	0.45	0.6	0.68	3.12	0.19	0.53	0.38
S0609512-048	SP-16	36-56	9.0	52.2	0.34	0.6	0.45	3.38	0.14	0.77	0.56
S0609512-049	SP-16	56-68	8.9	36.3	0.60	0.3	0.52	4.30	0.16	1.21	0.78
S0609512-050	SP-16	68-96	8.9	55.3	0.53	0.6	1.00	3.49	0.18	1.21	0.81
S0609512-051	WRD-18	0-9	8.2	43.4	0.35	3.6	4.56	1.75	0.65	0.31	0.18
S0609512-052	WRD-18	9-19	8.3	41.3	0.61	1.8	3.45	1.56	0.80	0.27	0.17
S0609512-053	WRD-18	19-34	8.5	35.8	0.52	1.2	2.41	2.17	0.18	0.31	0.21
S0609512-054	WRD-18	34-54	8.7	45.5	0.38	1.4	1.63	1.70	0.12	0.35	0.27
S0609512-055	WRD-18	54-72	8.6	49.6	0.57	1.1	1.92	2.53	0.18	0.46	0.31
S0609512-056	WRD-18	72-96	8.6	34.7	1.46	0.5	2.97	11.0	0.19	1.48	0.56
S0609512-057	WRD-19	0-6	8.0	48.5	0.91	4.9	4.87	2.07	1.72	0.28	0.15
S0609512-058	WRD-19	6-12	8.2	44.1	0.65	3.0	3.43	1.45	1.14	0.30	0.20
S0609512-059	WRD-19	12-24	8.3	40.8	0.53	2.0	2.85	1.21	0.87	0.32	0.23
S0609512-060	WRD-19	24-37	8.5	40.8	0.55	1.9	2.71	1.11	0.76	0.26	0.19
S0609512-061	WRD-19	37-51	8.4	34.1	0.57	1.2	2.94	1.39	0.59	0.27	0.18

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
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Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Your Enviromental Monitoring Partner

Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths In.	PE Alkalinity meq/L	Sand %	Silt %	Clay %	Texture	Very Fine Sand %
S0609512-042	SP-13	48-60	1.67	33.0	39.0	28.0	Clay Loam	13.4
S0609512-043	SP-13	60-72	7.00	62.0	14.0	24.0	Sandy Clay Loam	19.2
S0609512-044	SP-13	72-84	3.03	44.0	36.0	20.0	Loam	18.5
S0609512-045	SP-16	0-8	4.81	19.0	45.0	36.0	Silty Clay Loam	15.1
S0609512-046	SP-16	8-18	3.55	12.0	44.0	44.0	Silty Clay	10.8
S0609512-047	SP-16	18-36	4.18	20.0	52.0	28.0	Clay Loam	16.2
S0609512-048	SP-16	36-56	3.66	14.0	58.0	28.0	Silty Clay Loam	12.4
S0609512-049	SP-16	56-68	4.08	50.0	36.0	14.0	Loam	21.6
S0609512-050	SP-16	68-96	4.81	23.0	49.0	28.0	Clay Loam	17.0
S0609512-051	WRD-18	0-9	5.54	34.0	40.0	26.0	Loam	11.4
S0609512-052	WRD-18	9-19	4.60	50.0	30.0	20.0	Loam	16.2
S0609512-053	WRD-18	19-34	3.13	44.0	38.0	18.0	Loam	21.0
S0609512-054	WRD-18	34-54	2.61	21.0	47.0	32.0	Clay Loam	13.4
S0609512-055	WRD-18	54-72	3.76	22.0	44.0	34.0	Clay Loam	11.8
S0609512-056	WRD-18	72-96	8.99	48.0	32.0	20.0	Loam	21.2
S0609512-057	WRD-19	0-6	6.69	34.0	42.0	24.0	Loam	16.5
S0609512-058	WRD-19	6-12	4.39	32.0	36.0	32.0	Clay Loam	13.1
S0609512-059	WRD-19	12-24	2.51	34.0	36.0	30.0	Clay Loam	15.8
S0609512-060	WRD-19	24-37	3.13	49.0	29.0	22.0	Loam	24.5
S0609512-061	WRD-19	37-51	2.40	60.0	26.0	14.0	Sandy Loam	24.2

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Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0609512-042	SP-13	48-60	29.2			0.17	<0.01
S0609512-043	SP-13	60-72	20.6			0.23	0.99
S0609512-044	SP-13	72-84	28.7			0.29	0.73
S0609512-045	SP-16	0-8	9.6			1.19	18.3
S0609512-046	SP-16	8-18	24.5			0.21	4.70
S0609512-047	SP-16	18-36	38.8			0.24	6.45
S0609512-048	SP-16	36-56	40.1			0.23	5.10
S0609512-049	SP-16	56-68	28.1			0.30	2.83
S0609512-050	SP-16	68-96	31.0			0.24	1.25
S0609512-051	WRD-18	0-9	23.8	<0.02	0.39	3.96	18.6
S0609512-052	WRD-18	9-19	20.3	<0.02	0.25	0.31	2.89
S0609512-053	WRD-18	19-34	27.5	<0.02	0.18	0.09	5.50
S0609512-054	WRD-18	34-54	29.0	<0.02	0.33	0.50	0.93
S0609512-055	WRD-18	54-72	28.3	<0.02	0.29	0.10	1.19
S0609512-056	WRD-18	72-96	23.1	<0.02	0.19	0.45	0.21
S0609512-057	WRD-19	0-6	20.1			2.77	12.9
S0609512-058	WRD-19	6-12	17.4			1.85	8.32
S0609512-059	WRD-19	12-24	23.5			0.67	1.99
S0609512-060	WRD-19	24-37	24.6			0.35	0.99
S0609512-061	WRD-19	37-51	22.7				1.53

These results apply only to the samples tested.

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Karen Secor, Soil Lab Supervisor

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Your Enviromental Monitoring Partner

Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths In.	pH s.u.	Saturation %	Electrical Conductivity dS/m	Organic Matter %	PE Calcium meq/L	PE Magnesium meq/L	PE Potassium meq/L	PE Sodium meq/L	SAR
S0609512-062	WRD-19	51-68	8.5	29.1	0.48	0.8	2.07	1.87	0.22	0.36	0.26
S0609512-063	WRD-19	68-90	8.7	26.0	0.37	0.6	1.11	2.06	0.10	0.37	0.30
S0609512-064	WRD-21	0-8	8.4	30.6	0.46	2.0	2.94	0.74	0.48	0.26	0.19
S0609512-065	WRD-21	8-18	8.1	46.0	0.66	3.2	4.12	1.78	0.20	0.29	0.17
S0609512-066	WRD-21	18-36	8.4	30.5	0.49	1.2	2.64	1.61	0.10	0.33	0.22
S0609512-067	WRD-21	36-50	8.7	28.6	0.48	0.9	2.71	1.62	0.15	0.36	0.24
S0609512-068	WRD-21	50-62	8.7	27.9	0.37	1.0	1.91	1.24	0.12	0.32	0.25
S0609512-069	WRD-21	62-96	8.7	26.7	0.32	0.7	1.34	1.60	0.09	0.30	0.25

These results apply only to the samples tested.

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Project: Talon Resources Soil

Date Received: 9/28/2006

Date Reported: 11/13/2006

Work Order: S0609512

Lab ID	Sample ID	Depths	PE Alkalinity	Sand	Silt	Clay	Texture	Very Fine Sand
		In.	meq/L	%	%	%		%
S0609512-062	WRD-19	51-68	3.45	66.0	22.0	12.0	Sandy Loam	17.5
S0609512-063	WRD-19	68-90	2.93	71.0	19.0	10.0	Sandy Loam	17.6
S0609512-064	WRD-21	0-8	3.76	61.0	11.0	28.0	Sandy Clay Loam	18.6
S0609512-065	WRD-21	8-18	4.08	59.0	11.0	30.0	Sandy Clay Loam	47.0
S0609512-066	WRD-21	18-36	2.72	68.0	18.0	14.0	Sandy Loam	18.2
S0609512-067	WRD-21	36-50	3.34	67.0	25.0	8.0	Sandy Loam	14.2
S0609512-068	WRD-21	50-62	2.51	69.0	23.0	8.0	Sandy Loam	14.8
S0609512-069	WRD-21	62-96	2.51	68.0	20.0	12.0	Sandy Loam	23.7

These results apply only to the samples tested.

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Karen Secor, Soil Lab Supervisor

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PO Box 1230
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Report ID: S0609512001

Project: Talon Resources Soil
Date Received: 9/28/2006

Date Reported: 11/13/2006
Work Order: S0609512

Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0609512-062	WRD-19	51-68	19.7			0.41	1.71
S0609512-063	WRD-19	68-90	19.8			0.18	1.88
S0609512-064	WRD-21	0-8	21.2			2.30	7.11
S0609512-065	WRD-21	8-18	29.8			0.75	0.87
S0609512-066	WRD-21	18-36	20.3			0.26	2.48
S0609512-067	WRD-21	36-50	21.6			0.35	0.79
S0609512-068	WRD-21	50-62	16.8			0.46	2.66
S0609512-069	WRD-21	62-96	20.7			0.17	1.07

These results apply only to the samples tested.

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Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0610051001

Project: Talon Resources Soil
Date Received: 10/3/2006

Date Reported: 11/14/2006
Work Order: S0610051

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		In.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0610051-001	LOF-2	0-7	7.6	43.3	0.47	2.7	4.93	1.26	0.65	0.29	0.16
S0610051-002	LOF-2	7-12	7.7	44.8	0.31	2.4	2.07	0.68	0.19	0.22	0.19
S0610051-003	LOF-2	12-24	7.8	60.2	0.25	1.8	1.29	0.57	0.09	0.59	0.62
S0610051-004	LOF-2	24-48	8.0	67.7	0.32	1.7	0.77	0.53	0.07	1.71	2.12
S0610051-005	LOF-2	48-72	7.8	66.7	7.38	1.1	23.8	24.9	0.50	35.8	7.27
S0610051-006	LOF-2	72-96	7.8	62.9	7.17	1.1	21.6	26.3	0.47	37.9	7.75
S0610051-007	LOF-4	0-5	7.8	52.6	0.62	3.5	4.54	1.04	0.26	0.49	0.29
S0610051-008	LOF-4	5-10	7.7	53.0	0.31	2.8	2.28	0.63	0.08	0.32	0.26
S0610051-009	LOF-4	10-19	7.8	53.9	0.33	2.1	2.00	0.78	0.08	0.71	0.60
S0610051-010	LOF-4	19-31	7.9	53.6	0.29	1.8	1.12	0.52	0.06	1.05	1.16
S0610051-011	LOF-4	31-50	7.8	59.8	4.06	1.1	16.3	12.4	0.51	20.5	5.43
S0610051-012	RDV-7	0-6	7.5	62.9	0.58	4.4	3.93	1.17	0.28	0.20	0.13
S0610051-013	RDV-7	6-12	7.6	57.1	0.36	3.0	2.37	0.78	0.09	0.27	0.22
S0610051-014	RDV-7	12-24	8.0	55.3	0.24	1.8	0.82	0.44	0.04	1.04	1.30
S0610051-015	RDV-7	24-60	8.0	63.8	1.40	1.4	2.65	2.00	0.11	7.90	5.18
S0610051-016	1YR-9	0-6	8.0	63.0	0.62	6.1	2.19	3.21	0.74	0.12	0.07
S0610051-017	1YR-9	6-14	8.2	42.4	0.34	3.4	1.17	1.67	0.30	0.25	0.21
S0610051-018	1YR-9	14-28	8.5	35.7	0.88	0.9	1.16	5.71	0.72	1.06	0.57
S0610051-019	1YR-9	28-48	8.3	31.0	0.76	0.4	1.49	4.64	0.37	1.23	0.70
S0610051-020	1YR-10	0-7	7.8	46.4	0.46	3.9	3.39	0.89	0.30	0.08	0.05

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Your Enviromental Monitoring Partner

Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0610051001

Project: Talon Resources Soil
Date Received: 10/3/2006

Date Reported: 11/14/2006
Work Order: S0610051

Lab ID	Sample ID	Depths In.	PE Alkalinity meq/L	Sand %	Silt %	Clay %	Texture	Very Fine Sand %
S0610051-001	LOF-2	0-7	3.13	32.0	37.0	31.0	Clay Loam	14.9
S0610051-002	LOF-2	7-12	2.19	34.0	34.0	32.0	Clay Loam	22.3
S0610051-003	LOF-2	12-24	2.19	14.0	40.0	46.0	Silty Clay	12.4
S0610051-004	LOF-2	24-48	1.88	22.0	37.0	41.0	Clay	20.2
S0610051-005	LOF-2	48-72	1.25	14.0	43.0	43.0	Silty Clay	11.3
S0610051-006	LOF-2	72-96	0.94	18.0	35.0	47.0	Clay	13.0
S0610051-007	LOF-4	0-5	3.03	12.0	46.0	42.0	Silty Clay	9.1
S0610051-008	LOF-4	5-10	2.72	14.0	46.0	40.0	Silty Clay	11.0
S0610051-009	LOF-4	10-19	2.40	12.0	43.0	45.0	Silty Clay	10.5
S0610051-010	LOF-4	19-31	1.88	13.0	43.0	44.0	Silty Clay	11.3
S0610051-011	LOF-4	31-50	1.46	19.0	39.0	42.0	Clay	16.3
S0610051-012	RDV-7	0-6	3.76	26.0	38.0	36.0	Clay Loam	20.4
S0610051-013	RDV-7	6-12	2.82	18.0	38.0	44.0	Clay	11.9
S0610051-014	RDV-7	12-24	2.09	16.0	37.0	47.0	Clay	13.6
S0610051-015	RDV-7	24-60	1.78	22.0	34.0	44.0	Clay	20.8
S0610051-016	1YR-9	0-6	4.49	44.0	32.0	24.0	Loam	14.5
S0610051-017	1YR-9	6-14	2.30	52.0	25.0	23.0	Sandy Clay Loam	18.1
S0610051-018	1YR-9	14-28	3.03	64.0	22.0	14.0	Sandy Loam	9.7
S0610051-019	1YR-9	28-48	2.40	54.0	30.0	16.0	Sandy Loam	16.0
S0610051-020	1YR-10	0-7	4.18	36.0	38.0	26.0	Loam	17.9

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Soil Analysis Report

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Report ID: S0610051001

Project: Talon Resources Soil
Date Received: 10/3/2006

Date Reported: 11/14/2006
Work Order: S0610051

Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0610051-001	LOF-2	0-7	18.6	<0.02	0.27	1.58	9.55
S0610051-002	LOF-2	7-12	20.1	<0.02	0.24	0.55	0.40
S0610051-003	LOF-2	12-24	26.7	<0.02	0.30	0.31	<0.01
S0610051-004	LOF-2	24-48	26.9	<0.02	0.45	0.88	0.04
S0610051-005	LOF-2	48-72	27.5	0.09	1.08	1.07	0.40
S0610051-006	LOF-2	72-96	21.0	0.12	0.61	13.1	0.76
S0610051-007	LOF-4	0-5	22.5			4.16	0.79
S0610051-008	LOF-4	5-10	24.4			0.66	9.76
S0610051-009	LOF-4	10-19	25.3			0.53	0.64
S0610051-010	LOF-4	19-31	25.3			0.40	0.67
S0610051-011	LOF-4	31-50	27.6			1.06	0.43
S0610051-012	RDV-7	0-6	10.6			2.19	12.5
S0610051-013	RDV-7	6-12	13.2			0.28	7.78
S0610051-014	RDV-7	12-24	21.2			0.40	0.73
S0610051-015	RDV-7	24-60	23.4			0.30	0.46
S0610051-016	1YR-9	0-6	18.6			1.73	1.44
S0610051-017	1YR-9	6-14	15.3			0.91	<0.01
S0610051-018	1YR-9	14-28	21.2			0.50	<0.01
S0610051-019	1YR-9	28-48	26.4			0.48	<0.01
S0610051-020	1YR-10	0-7	19.2	<0.02	0.29	3.15	7.45

These results apply only to the samples tested.

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Karen Secor, Soil Lab Supervisor

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Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0610051001

Project: Talon Resources Soil
Date Received: 10/3/2006

Date Reported: 11/14/2006
Work Order: S0610051

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		In.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0610051-021	1YR-10	7-13	7.7	44.4	0.40	2.4	2.58	0.80	0.24	0.08	0.06
S0610051-022	1YR-10	13-26	7.9	41.7	0.34	1.6	2.00	0.95	0.21	0.09	0.07
S0610051-023	1YR-10	26-44	8.3	45.4	0.36	1.0	0.83	2.50	0.08	0.20	0.16
S0610051-024	1YR-10	44-68	8.5	46.0	0.34	0.5	0.71	2.07	0.05	0.58	0.49
S0610051-025	1YR-10	68-84	8.4	28.0	0.46	0.2	0.77	2.96	0.05	0.66	0.48
S0610051-026	1YR-12	0-5	7.8	46.8	0.38	2.3	2.66	0.91	0.20	0.17	0.13
S0610051-027	1YR-12	5-10	7.8	50.6	0.29	1.9	1.79	0.69	0.08	0.66	0.59
S0610051-028	1YR-12	10-26	8.4	58.6	0.21	0.7	0.50	0.24	0.04	1.34	2.20
S0610051-029	1YR-12	26-44	8.3	93.0	0.86	0.7	0.91	0.57	0.08	5.89	6.84
S0610051-030	SP-14	0-6	8.7	58.6	0.54	4.0	2.34	2.42	0.35	0.22	0.14
S0610051-031	SP-14	6-13	7.8	62.4	0.36	2.1	1.08	2.05	0.17	0.27	0.22
S0610051-032	SP-14	13-28	8.1	50.7	0.53	0.7	0.41	3.76	0.14	0.70	0.49
S0610051-033	SP-14	28-48	8.7	43.7	0.77	0.4	0.49	5.04	0.10	2.24	1.35
S0610051-034	SP-14	48-70	8.8	41.7	0.80	0.4	0.54	4.79	0.11	2.61	1.60
S0610051-035	WRD-23	62-80	8.1	43.9	0.44	0.8	1.61	1.95	0.14	0.64	0.48
S0610051-036	DAH-24	0-5	7.6	73.6	0.26	1.3	1.25	0.58	0.09	0.50	0.53
S0610051-037	DAH-24	5-17	7.7	84.1	0.43	1.2	1.62	0.65	0.09	1.40	1.32
S0610051-038	DAH-24	17-32	8.1	91.2	7.79	0.9	18.7	30.7	0.54	49.9	10.0
S0610051-040	DAH-25	0-5	6.4	58.5	0.21	3.3	0.98	0.62	0.08	0.49	0.55
S0610051-041	DAH-25	5-13	7.0	80.6	0.33	2.4	1.90	0.68	0.13	0.23	0.21

These results apply only to the samples tested.

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Karen Secor, Soil Lab Supervisor

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Soil Analysis Report

Talon Resources, Inc.

PO Box 1230

Huntington, UT 84528

Report ID: S0610051001

Project: Talon Resources Soil

Date Received: 10/3/2006

Date Reported: 11/14/2006

Work Order: S0610051

Lab ID	Sample ID	Depths	PE Alkalinity	Sand	Silt	Clay	Texture	Very Fine Sand
		In.	meq/L	%	%	%		%
S0610051-021	1YR-10	7-13	3.13	26.0	48.0	26.0	Loam	12.3
S0610051-022	1YR-10	13-26	3.03	14.0	52.0	34.0	Silty Clay Loam	9.4
S0610051-023	1YR-10	26-44	3.55	30.0	36.0	34.0	Clay Loam	29.1
S0610051-024	1YR-10	44-68	2.51	14.0	54.0	32.0	Silty Clay Loam	7.0
S0610051-025	1YR-10	68-84	2.93	60.0	30.0	10.0	Sandy Loam	24.5
S0610051-026	1YR-12	0-5	3.03	32.0	40.0	28.0	Clay Loam	28.9
S0610051-027	1YR-12	5-10	2.51	29.0	39.0	32.0	Clay Loam	22.2
S0610051-028	1YR-12	10-26	1.99	16.0	40.0	44.0	Silty Clay	13.8
S0610051-029	1YR-12	26-44	1.67	46.0	19.0	35.0	Sandy Clay	45.0
S0610051-030	SP-14	0-6	4.81	8.0	48.0	44.0	Silty Clay	5.3
S0610051-031	SP-14	6-13	2.61	8.0	48.0	44.0	Silty Clay	5.7
S0610051-032	SP-14	13-28	4.28	23.0	50.0	27.0	Clay Loam	21.4
S0610051-033	SP-14	28-48	3.55	40.0	43.0	17.0	Loam	33.6
S0610051-034	SP-14	48-70	5.12	21.0	40.0	39.0	Clay Loam	5.6
S0610051-035	WRD-23	62-80	2.09	18.0	41.0	41.0	Silty Clay	14.0
S0610051-036	DAH-24	0-5	1.57	34.0	19.0	47.0	Clay	33.0
S0610051-037	DAH-24	5-17	1.88	42.0	14.0	44.0	Clay	41.4
S0610051-038	DAH-24	17-32	1.88	38.0	17.0	45.0	Clay	36.5
S0610051-040	DAH-25	0-5	0.52	32.0	28.0	40.0	Clay	21.1
S0610051-041	DAH-25	5-13	1.36	30.0	23.0	47.0	Clay	21.6

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Report ID: S0610051001

Project: Talon Resources Soil
Date Received: 10/3/2006

Date Reported: 11/14/2006
Work Order: S0610051

Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0610051-021	1YR-10	7-13	13.9	<0.02	0.31	0.46	0.67
S0610051-022	1YR-10	13-26	27.8	<0.02	0.20	0.44	0.37
S0610051-023	1YR-10	26-44	35.5	<0.02	0.37	0.15	<0.01
S0610051-024	1YR-10	44-68	34.4	<0.02	0.24	0.19	<0.01
S0610051-025	1YR-10	68-84	26.4	<0.02	0.07	0.32	0.67
S0610051-026	1YR-12	0-5	0.1			0.87	7.33
S0610051-027	1YR-12	5-10	9.3			0.67	0.22
S0610051-028	1YR-12	10-26	18.8			0.94	<0.01
S0610051-029	1YR-12	26-44	11.9			0.20	<0.01
S0610051-030	SP-14	0-6	7.5			0.38	8.92
S0610051-031	SP-14	6-13	19.9			0.58	2.94
S0610051-032	SP-14	13-28	44.0			0.17	4.40
S0610051-033	SP-14	28-48	39.3			0.21	2.67
S0610051-034	SP-14	48-70	30.9			0.41	3.54
S0610051-035	WRD-23	62-80	30.4			0.35	1.65
S0610051-036	DAH-24	0-5	2.9	<0.02	0.23	4.14	2.25
S0610051-037	DAH-24	5-17	8.7	<0.02	0.42	0.19	0.16
S0610051-038	DAH-24	17-32	5.0	<0.02	0.73	0.09	<0.01
S0610051-040	DAH-25	0-5	1.7			3.85	6.80
S0610051-041	DAH-25	5-13	30.3			0.20	0.19

These results apply only to the samples tested.

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Karen Secor, Soil Lab Supervisor

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Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0610051001

Project: Talon Resources Soil
Date Received: 10/3/2006

Date Reported: 11/14/2006
Work Order: S0610051

Lab ID	Sample ID	Depths In.	pH s.u.	Saturation %	Electrical Conductivity dS/m	Organic Matter %	PE Calcium meq/L	PE Magnesium meq/L	PE Potassium meq/L	PE Sodium meq/L	SAR
S0610051-042	DAH-25	13-20	7.2	73.5	0.28	2.1	1.44	0.44	0.12	0.22	0.23
S0610051-043	DAH-25	20-32	7.7	54.1	0.26	1.2	1.34	0.52	0.09	0.25	0.25
S0610051-045	SP-14	70-90	8.5	55.0	0.89	0.6	0.74	3.87	0.11	1.94	1.28
S0610051-046	SP-15	0-8	8.0	46.5	0.54	3.5	2.01	2.43	0.41	0.12	0.08
S0610051-047	SP-15	8-20	8.5	35.2	0.50	0.8	0.70	3.80	0.31	0.17	0.11
S0610051-048	SP-15	20-37	8.7	30.7	0.78	0.5	0.64	5.91	0.21	1.30	0.72
S0610051-049	SP-15	37-58	8.6	36.9	1.56	0.4	0.90	12.0	0.18	4.60	1.81
S0610051-050	SP-15	58-73	8.4	27.2	3.35	0.1	2.52	33.5	0.26	8.14	1.92
S0610051-051	SP-15	73-96	8.3	30.2	1.77	0.3	1.70	12.4	0.19	3.30	1.24
S0610051-052	WRD-17	0-9	7.8	49.8	0.43	4.6	1.74	1.11	0.51	0.14	0.11
S0610051-053	WRD-17	9-18	8.0	39.6	0.24	2.0	1.14	0.63	0.23	0.16	0.17
S0610051-054	WRD-17	18-30	8.0	38.5	0.32	1.6	0.99	0.69	0.15	0.10	0.11
S0610051-055	WRD-17	30-45	8.1	39.3	0.28	0.8	0.59	0.56	0.05	0.10	0.13
S0610051-056	WRD-17	45-60	8.2	40.0	0.34	0.8	1.17	1.64	0.07	0.26	0.22
S0610051-057	WRD-17	60-80	8.0	61.3	0.82	1.1	2.86	4.00	0.14	0.69	0.37
S0610051-058	WRD-18A	0-7	7.7	46.0	0.61	3.9	3.08	1.36	0.59	0.15	0.10
S0610051-059	WRD-18A	7-15	8.0	43.4	0.33	2.1	1.45	1.00	0.28	0.13	0.12
S0610051-060	WRD-18A	15-30	8.1	31.1	0.51	0.7	1.97	2.13	0.09	0.41	0.29
S0610051-061	WRD-18A	30-45	8.0	52.4	0.67	1.5	2.66	3.06	0.12	0.51	0.30
S0610051-062	WRD-18A	45-60	7.9	36.1	0.44	0.7	1.67	1.63	0.06	0.47	0.36

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Your Enviromental Monitoring Partner

Soil Analysis Report

Talon Resources, Inc.

PO Box 1230
Huntington, UT 84528

Report ID: S0610051001

Project: Talon Resources Soil
Date Received: 10/3/2006

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Lab ID	Sample ID	Depths In.	PE Alkalinity meq/L	Sand %	Silt %	Clay %	Texture	Very Fine Sand %
S0610051-042	DAH-25	13-20	1.88	30.0	24.0	46.0	Clay	20.7
S0610051-043	DAH-25	20-32	1.88	48.0	19.0	33.0	Sandy Clay Loam	37.6
S0610051-045	SP-14	70-90	2.61	21.0	47.0	32.0	Clay Loam	17.7
S0610051-046	SP-15	0-8	4.70	52.0	32.0	16.0	Sandy Loam	24.2
S0610051-047	SP-15	8-20	4.60	50.0	32.0	18.0	Loam	24.3
S0610051-048	SP-15	20-37	4.08	51.0	34.0	15.0	Loam	23.7
S0610051-049	SP-15	37-58	3.03	39.0	43.0	18.0	Loam	22.7
S0610051-050	SP-15	58-73	1.99	74.0	18.0	8.0	Sandy Loam	19.2
S0610051-051	SP-15	73-96	2.82	52.0	34.0	14.0	Sandy Loam	25.3
S0610051-052	WRD-17	0-9	3.34	22.0	42.0	36.0	Clay Loam	11.0
S0610051-053	WRD-17	9-18	1.78	34.0	34.0	32.0	Clay Loam	16.6
S0610051-054	WRD-17	18-30	2.61	44.0	34.0	22.0	Loam	17.3
S0610051-055	WRD-17	30-45	2.40	36.0	37.0	27.0	Clay Loam	17.5
S0610051-056	WRD-17	45-60	2.19	24.0	44.0	32.0	Clay Loam	14.8
S0610051-057	WRD-17	60-80	1.88	18.0	40.0	42.0	Silty Clay	17.0
S0610051-058	WRD-18A	0-7	3.97	41.0	33.0	26.0	Loam	18.3
S0610051-059	WRD-18A	7-15	2.30	43.0	33.0	24.0	Loam	20.0
S0610051-060	WRD-18A	15-30	2.30	60.0	23.0	17.0	Sandy Loam	17.6
S0610051-061	WRD-18A	30-45	1.88	24.0	41.0	35.0	Clay Loam	13.8
S0610051-062	WRD-18A	45-60	2.09	57.0	23.0	20.0	Sandy Clay Loam	18.4

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

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Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0610051-042	DAH-25	13-20	39.4			0.29	1.32
S0610051-043	DAH-25	20-32	3.8			0.15	0.43
S0610051-045	SP-14	70-90	31.5			0.64	0.31
S0610051-046	SP-15	0-8	10.8			0.68	4.82
S0610051-047	SP-15	8-20	27.6			0.16	1.80
S0610051-048	SP-15	20-37	31.9			0.58	1.56
S0610051-049	SP-15	37-58	33.4			0.32	1.20
S0610051-050	SP-15	58-73	26.3			0.36	0.82
S0610051-051	SP-15	73-96	28.1			0.54	<0.01
S0610051-052	WRD-17	0-9	25.4			1.09	8.05
S0610051-053	WRD-17	9-18	25.3			0.28	1.26
S0610051-054	WRD-17	18-30	25.3			0.85	2.49
S0610051-055	WRD-17	30-45	29.5			0.10	2.82
S0610051-056	WRD-17	45-60	33.5			0.11	0.13
S0610051-057	WRD-17	60-80	33.0			0.59	0.70
S0610051-058	WRD-18A	0-7	20.2			0.57	1.95
S0610051-059	WRD-18A	7-15	24.7			0.68	0.61
S0610051-060	WRD-18A	15-30	28.2			0.08	2.43
S0610051-061	WRD-18A	30-45	29.3			0.13	0.34
S0610051-062	WRD-18A	45-60	25.8			0.16	<0.01

These results apply only to the samples tested.

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Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

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Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	PE Calcium	PE Magnesium	PE Potassium	PE Sodium	SAR
		In.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	meq/L	
S0610051-063	WRD-20	0-6	7.9	53.3	0.57	6.6	2.75	1.83	0.58	0.12	0.08
S0610051-064	WRD-20	6-13	7.8	47.6	0.56	2.4	2.47	1.47	0.67	0.14	0.10
S0610051-065	WRD-20	13-28	8.1	24.1	0.27	0.6	1.22	0.63	0.32	0.13	0.14
S0610051-066	WRD-20	28-54	8.0	25.4	0.32	0.2	1.40	0.76	0.42	0.07	0.07
S0610051-067	WRD-20	54-72	8.1	38.5	0.27	1.1	1.18	0.87	0.21	0.24	0.23
S0610051-068	WRD-22	0-6	7.7	36.6	0.40	1.8	2.16	0.88	0.35	0.08	0.07
S0610051-069	WRD-22	6-15	7.7	48.0	0.34	3.7	1.85	0.83	0.19	0.16	0.13
S0610051-070	WRD-22	15-28	8.0	34.9	0.29	1.2	1.64	0.80	0.18	0.13	0.11
S0610051-071	WRD-22	28-48	8.0	28.0	0.25	0.8	1.18	0.64	0.16	0.13	0.14
S0610051-072	WRD-22	48-60	8.0	30.1	0.27	1.0	1.34	0.67	0.16	0.10	0.10
S0610051-073	WRD-22	60-84	8.2	27.3	0.30	0.5	1.08	0.96	0.25	0.09	0.09
S0610051-074	WRD-23	0-6	7.7	48.4	0.60	4.9	3.20	1.35	0.53	0.07	0.05
S0610051-075	WRD-23	6-12	7.9	44.6	0.38	2.9	1.97	0.91	0.30	0.15	0.13
S0610051-076	WRD-23	12-22	7.9	41.0	0.35	1.8	1.76	0.92	0.16	0.14	0.12
S0610051-077	WRD-23	22-40	8.0	33.2	0.24	0.7	1.12	0.77	0.06	0.15	0.16
S0610051-078	WRD-23	40-62	8.2	38.6	0.23	0.6	1.01	0.94	0.06	0.24	0.24
S0610051-079	WRD-20	72-96	8.2	28.3	0.32	0.3	0.97	1.23	0.28	0.16	0.16

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
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Lab ID	Sample ID	Depths	PE Alkalinity	Sand	Silt	Clay	Texture	Very Fine Sand
		In.	meq/L	%	%	%		%
S0610051-063	WRD-20	0-6	4.49	39.0	37.0	24.0	Loam	15.4
S0610051-064	WRD-20	6-13	3.13	41.0	29.0	30.0	Clay Loam	17.7
S0610051-065	WRD-20	13-28	2.30	69.0	21.0	10.0	Sandy Loam	18.6
S0610051-066	WRD-20	28-54	2.72	79.0	14.0	7.0	Loamy Sand	15.8
S0610051-067	WRD-20	54-72	2.51	45.0	29.0	26.0	Loam	13.9
S0610051-068	WRD-22	0-6	3.13	63.0	23.0	14.0	Sandy Loam	25.0
S0610051-069	WRD-22	6-15	2.72	19.0	42.0	39.0	Silty Clay Loam	7.0
S0610051-070	WRD-22	15-28	2.72	47.0	27.0	26.0	Sandy Clay Loam	5.6
S0610051-071	WRD-22	28-48	2.30	65.0	21.0	14.0	Sandy Loam	13.7
S0610051-072	WRD-22	48-60	2.30	65.0	21.0	14.0	Sandy Loam	14.5
S0610051-073	WRD-22	60-84	2.51	74.0	18.0	8.0	Sandy Loam	21.8
S0610051-074	WRD-23	0-6	4.60	31.0	38.0	31.0	Clay Loam	12.5
S0610051-075	WRD-23	6-12	3.34	36.0	33.0	31.0	Clay Loam	14.7
S0610051-076	WRD-23	12-22	3.24	38.0	34.0	28.0	Clay Loam	12.5
S0610051-077	WRD-23	22-40	2.30	51.0	30.0	19.0	Loam	17.2
S0610051-078	WRD-23	40-62	1.99	31.0	44.0	25.0	Loam	20.0
S0610051-079	WRD-20	72-96	2.51	82.0	13.0	5.0	Loamy Sand	17.6

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage

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Lab ID	Sample ID	Depths In.	CO3 %	Selenium ppm	Boron ppm	Nitrate (as N) ppm	Phosphorus ppm
S0610051-063	WRD-20	0-6	18.4			0.19	0.94
S0610051-064	WRD-20	6-13	20.8			0.12	1.62
S0610051-065	WRD-20	13-28	25.4			0.07	0.37
S0610051-066	WRD-20	28-54	21.7			0.03	0.94
S0610051-067	WRD-20	54-72	24.3			0.53	1.23
S0610051-068	WRD-22	0-6	20.2			1.94	4.52
S0610051-069	WRD-22	6-15	23.8			0.76	9.01
S0610051-070	WRD-22	15-28	18.9			0.80	0.31
S0610051-071	WRD-22	28-48	17.9			0.29	0.13
S0610051-072	WRD-22	48-60	17.5			0.35	0.07
S0610051-073	WRD-22	60-84	21.0			0.57	0.28
S0610051-074	WRD-23	0-6	21.4			1.43	8.26
S0610051-075	WRD-23	6-12	23.6			0.31	1.74
S0610051-076	WRD-23	12-22	25.6			0.29	1.09
S0610051-077	WRD-23	22-40	29.8			0.21	1.03
S0610051-078	WRD-23	40-62	35.3			0.89	0.28
S0610051-079	WRD-20	72-96	16.5			0.29	0.28

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
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Reviewed by: Karen A Secor
Karen Secor, Soil Lab Supervisor

APPENDICES

DRAWINGS

General

Facilities (5-3 to 5-8C)

Coal Recovery (5-9 to 5-14)

Overburden Handling (5-15 to 5-19)

Robinson Creek Temporary Diversion and Reconstruction (5-20 to 5-21)

and removed from the permit area and will be properly disposed of according to applicable State and Federal regulations.

528.332.

Final disposal of noncoal mine wastes will be in a State-approved solid waste disposal site not located within the permit area.

528.333.

At no time will any noncoal mine waste be deposited in a refuse pile or impounding structure, nor will any excavation for a noncoal mine waste disposal site be located within eight feet of any coal outcrop or coal storage area.

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.

528.350. Acid-Forming and Toxic Materials

If coal, having qualities that make it unmarketable, are to be left in the pit backfill in quantities greater than 5,000 tons: a minimum of 1 composite sample per 5,000 Tons of coal will be analyzed for the parameters list in Table 3 and 7 of the "Soil and Overburden Guidelines". A record of the volume of coal remaining and laboratory analytical results will be kept onsite. Debris, acid-forming, toxic-forming materials and materials constituting a fire hazard will be identified and 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. Appropriate measures will be implemented to preclude sustained combustion of such materials; and

528.400. Dams, embankments and other impoundments.

Plans do not include using dams, embankments or other impoundments for disposal of coal, overburden, excess spoil or coal mine waste

529. **MANAGEMENT OF MINE OPENINGS.**

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

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole

above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface flows into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer's office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer's office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to

DRAWINGS

TABLES

APPENDICES

Appendix 7-10	Permanent shale barrier
Appendix 7-11	Petersen Hydrologic, LLC hydrologic investigation of mine-water inflows and re-evaluation of sediment pond network
Appendix 7-12	UPEDS Permit No. UTG040027
Appendix 7-13	Petersen Hydrologic, LLC hydrologic investigation to evaluate the acid/neutralization behavior of groundwater in the coal seam

Darcy's Law may be expressed as.

$$Q = KIA$$

Where	Q	=	groundwater discharge rate
	K	=	hydraulic conductivity
	I	=	hydraulic gradient
	A	=	cross-sectional area

The values listed in Table 7-9 are reported as inflow rates per 100 lineal feet of mine openings oriented perpendicular to the groundwater flow direction. Calculations at individual locations are adjusted for the thickness of the saturated alluvium at that location. For all calculations in Table 7-9, a gradient of 0.10 has been used, which is considered a conservative estimate for the alluvial groundwater system in the vicinity of the planned Coal Hollow Mine workings. It is important to note that while values for saturated aquifer thickness and local hydraulic gradient in the alluvial groundwater system can be determined relatively precisely, hydraulic conductivity values determined from slug testing methods are generally considered as order-of-magnitude estimates. Consequently, the information from Table 7-9 should be used for general purposes only. The estimated groundwater inflow rates presented in Table 7-9 suggest that copious, unmanageable amounts of alluvial groundwater will likely not be encountered. It should be noted, however, that alluvial sediments located east of the C2 well cluster may contain coarser grained sediments similar to those intercepted in well Y-102. Special mining protocols will be employed (See Appendix 7-9) when mining in this area (pit15; see Section 728.333) to minimize the potential for interception of large groundwater inflows.

As described in Appendix 7-11, Table 7-9 has been updated to reflect the current pit mine-inflow conditions in the Pit #2 and adjacent areas.

As surface mining operations advance toward the alluvial groundwater discharge area in the northwest ¼ of Section 29, T39S, R5W (See Drawing 7-4; groundwater discharge area A), the information in Table 7-9 suggests that groundwater inflow rates in this area will be modest, generally on the order of a few tens of gallons per minute or less per 100 lineal feet of mine opening. However, it should be noted that, as discussed above, if mine openings in this area were to intersect a substantial thickness of coarse-grained alluvial material that was in good hydraulic communication with the coarse-grained alluvial system located along the eastern margins of Sink Valley, substantially greater rates of groundwater inflow could occur. Based on the information in Tables 7-8 and 7-9, this is not considered likely.

As mining operations advance toward the alluvial groundwater discharge area in the northwest ¼ of Section 29, T39S, R5W (See Drawing 7-4; groundwater discharge area A) and groundwater discharge from up-gradient alluvial groundwater systems occurs, there is the potential that discharge rates from alluvial springs in this area could be diminished. The magnitude of this potential impact will be largely dependent on the

will be emplaced adjacent to the undisturbed alluvial sediments along the eastern edge of the pit 15 disturbance area. Information and design details for this low-permeability barrier are provided in Appendix 7-10. An evaluation of the permanent barrier for pit 15 has been performed by Mr. Alan O. Taylor of Taylor Geo-Engineering, LLC. Information in the Taylor Geo-Engineering report indicates that the 50-foot wide barrier will prevent any appreciable drainage of alluvial groundwater from the coarse-grained alluvial groundwater system centered east of the permit area into the backfilled pit areas. Laboratory analysis of the Tropic Shale material from which the barrier will be constructed indicates that the compacted shale material will perform adequately to successfully contain the alluvial groundwater. Using this technique, the pit areas will be reclaimed to restore the approximate pre-existing groundwater levels in Sink Valley.

Accordingly, the potential for impacts to subirrigation and soil moisture in the lands up-gradient of mining areas will be minimized by both the placment of the low-permability backfill, and the emplacement of the low-permeability engineered barrier adjacent to Pit 15.

The potential for short-term impacts to subirrigation and soil moisture in the lands up-gradienet of proposed mining areas will be minimized through the implementation of the hydrology resource contingency plan described in Appendix 7-9.

If any Utah State appropriated water rights are impacted by mining and reclamation operations in the proposed Coal Hollow Mine, these will be replaced according to all applicable Utah State laws and regulations using the designated water replacement source described in Section 727 above.

728.320 Presence of acid-forming or toxic-forming materials

Chemical information on the acid- and toxic-forming potential of earth materials naturally present in the proposed permit area are presented in Appendix 6-2. Chemical information on the low-sulfur Smirl coal seam proposed for mining is presented in Appendix 6-1 (confidential binder). Based on laboratory analytical data, it is apparent that acid-forming and toxic-forming materials that could result in the contamination of surface-water or groundwater supplies in the proposed Coal Hollow Mine permit and adjacent area are generally not present.

Total selenium (with a 5 mg/kg laboratory lower detection limit) was not detected in any of the samples from the proposed Coal Hollow Mine permit area. Water-extractable selenium concentrations were also generally low (see Section 728.332 below). Likewise, concentrations of water-extractable boron were also low, being less than 3 mg/kg in all samples analyzed. The pH of groundwaters in and around the proposed Coal Hollow Mine permit area are moderately alkaline (UDOGM, 2007). Data in Appendix 6-2 likewise indicate moderately alkaline conditions in sediments in the proposed permit area. The solubility of dissolved trace metals is usually limited in waters with alkaline pH conditions. Consequently, high concentrations of these metal

constituents in groundwaters and surface waters with elevated pH levels are not anticipated. Additionally, most of the materials that will be handled as part of mining and reclamation activities in the proposed Coal Hollow Mine area are of low hydraulic conductivity (i.e. clays, silts, shales, siltstones, claystones, etc.). Consequently, it is anticipated that groundwater seepage volumes through low-permeability backfill and reclaimed land surfaces in reclaimed mine pit areas and excess spoils storage areas will not be large. Additionally, reclaimed areas will be regraded, sloped, and otherwise managed to minimize the potential for land erosion, to restore approximate surface-water drainage patterns, and also to minimize the potential for ponding of surface waters on reclaimed areas (other than "roughening" or "gouging" of some areas to enhance reclamation). Thus, the potential for interactions between large amounts of disturbed earth materials and groundwaters and surface waters, which could result in leaching of chemical constituents into groundwater and surface-water resources, will be minimized.

Additionally, the mining plan calls for the emplacement of 40 inches of suitable cover material over backfilled areas made up of material types which could appreciably impact vegetation (materials with elevated SAR ratios or other physical or chemical characteristics that could adversely impact vegetation).

The neutralization potential greatly exceeded the acid potential in all overburden and underburden samples analyzed, with the neutralization potential commonly exceeding the acid potential by many times, suggesting that acid-mine-drainage will not be a concern at the proposed Coal Hollow Mine (see Section 728.332 below for a further discussion) Acid-forming materials in western coal mine environments often consist of sulfide minerals, commonly including pyrite and marcasite, which, when exposed to air and water, are oxidized causing the liberation of H^+ ions (acid) into the water. Oxidation of sulfide minerals may occur in limited amounts in the mine pits where oxygenated water encounters sulfide minerals. However, the acid produced by pyrite oxidation is quickly consumed by dissolution of abundant, naturally occurring carbonate minerals (Appendix 6-2). Dissolved iron is readily precipitated as iron-hydroxide in well aerated waters, and consequently excess iron is not anticipated in mine discharge water.

Other acid-forming materials or toxic-forming materials have not been identified in significant concentrations nor are such suspected to exist in materials to be disturbed by mining.

Because of the overall low-permeability of the rock strata and sediments surrounding the mine workings (primarily the shales and claystones of the lower Tropic Shale), the potential for seepage of mine water outward into adjacent stratigraphic horizons is low. Additionally, because the floors of the mine pits need to be accessible in order to extract the coal, the mining operations will be carried out in such a manner that the accumulation of large amounts of water in the mine pits will be avoided.

728.331 Sediment yield from the disturbed area.

Erosion from disturbed areas will be minimized through the use of silt fences and other sediment control devices. Surface runoff occurring on disturbed areas will be collected and treated as necessary to remove suspended matter. Four diversion ditches along with five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence and berms are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

The smallest practicable area, consistent with reasonable and safe mine operational practices will be disturbed at any one time during the mining operation and reclamation phases. This will be accomplished through progressive backfilling, grading, and prompt revegetation of disturbed areas. The backfilled material will be stabilized by grading to promote a reduction of the rate and volume of runoff in accordance with the applicable requirements. The excess spoil and fill above approximate original contour will be graded to a maximum 3h:1v slope and revegetated to minimize erosion.

Cut ditches will be established on the shoulders of all primary roads to control drainage and erosion. Cut and fill slopes along the primary roads will be minimal and are not expected to cause significant erosion. In locations where there are culvert crossings (i.e. Lower Robinson Creek), the fills slopes will be stabilized by utilizing standard methods such as grass matting or straw wattles. The location and details for roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

Through the implementation of these sediment control measures, it is anticipated that sediment yield from disturbed areas in the proposed Coal Hollow Mine permit area will be minimized.

728.332 Impacts to important water quality parameters

As discussed above, appreciable quantities of groundwater are not anticipated to be intercepted in the Tropic Shale overlying proposed mining areas. Consequently, discharge of Tropic Shale groundwaters from mining areas is not anticipated. Because of the very low hydraulic conductivity of the marine Tropic Shale unit which immediately overlies the coal in proposed mining areas, the lateral migration of appreciable amounts of groundwater outward from proposed mine pit areas is not anticipated. Therefore, no impacts to important water quality parameters in surrounding groundwater and surface-water resources that could result from the interception of Tropic Shale groundwaters are anticipated.

Similarly, appreciable quantities of groundwater are not expected to emanate from the Dakota Formation in the mine floor into the mine openings. This conclusion is based on

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. Discharge of mine waters will be regulated by a Utah UPDES discharge permit.

Water pollution associated with mining and reclamation activities within the permit areas will be controlled by:

- Construction of berms and/or diversion ditches to control runoff from all facilities areas.
- Roads will be constructed with ditches to capture runoff
- Diversion ditches will be constructed as necessary around active mining and reclamation areas to capture runoff from those areas.
- Sedimentation impoundments will be constructed to control discharges
- In areas where impoundments or diversions are not suitable to the surrounding terrain, silt fence or straw bales will be utilized to control sediment discharge from the permit area.

In order to accomplish these objectives, watershed analysis of the permit and adjacent areas has been completed and specific designs are established for each water pollution control structure. Primary control structures include five sediment impoundments, four diversion ditches and miscellaneous berms. The locations of these structures can be viewed on Drawing 5-3. The detailed analysis for these structures and specific designs can be viewed on Drawings 5-25 through 5-34. In addition, a geotechnical analysis of the impoundments to ensure stability can be viewed in Appendix 5-1. The watershed and structure sizing analysis can be viewed in Appendix 5-2. In addition to these primary structures, temporary diversions and impoundments may also be implemented, as necessary, in mining areas to further enhance pollution controls.

Sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-760. Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-763. Storm water and snow melt that occurs within the facilities area will be routed to an impoundment that will contain sediment. This impoundment will have a drop-pipe spillway installed that will allow removal of any oil sheens that may result from parking lots or maintenance activities by using absorbent materials to remove the sheen. Details for this impoundment can be viewed on Drawings 5-28.

There are five sediment impoundments proposed for the permit area. These structures will be constructed using a combination of dozers and backhoes. The structures have been designed to contain the required storm events as specified in Appendix 5-2. The structures will have sediment removed as necessary to ensure the required capacities. Details for these structures can be viewed on Drawings 5-25, 5-26 and 5-28 through 5-32. Calculations and supporting text can be viewed in Appendix 5-2.

Four diversion ditches along with five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence and berms are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

The smallest practicable area, consistent with reasonable and safe mine operational practices will be disturbed at any one time during the mining operation and reclamation phases. This will be accomplished through progressive backfilling, grading, and prompt revegetation of disturbed areas.

There are no other coal processing waste banks, dams or embankments proposed within the permit area.

Diesel fuels, oils, greases, and other hydrocarbons products will be stored and used at the mine site for a variety of purposes. A spill Prevention Control and Countermeasure Plan will be implemented that will help minimize any potential detrimental impacts to the environments.

Products including potentially hazardous chemicals, fuels, and oils used in the mining process will be stored and used in a manner that minimizes the potential for these products to contaminate surface-water resources. Concrete oil and fuel containments will be constructed as shown on Drawings 5-3 and 5-8.

The wash bay at the mine site will include a closed circuit water recycle system. This system will eliminate and store water impurities and reroute water back through the wash bay for cleaning equipment, thus minimizing water consumption the potential for contamination of surface-water resources. Details for this structure can be viewed on Drawings 5-3, 5-8, and Appendix 5-4. .

Roads will be located, designed, constructed, reconstructed, used, maintained and reclaimed according to R645-301-732.400, R645-301-742.400 and R645-301-762. The specific plan for road locations and design are presented in R645-301-534. The location and details for roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

Roads will be located, designed, constructed, reconstructed, used, maintained and reclaimed to control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area; Neither cause nor contribute to, directly or indirectly, the violation of effluent standards given under R645-301-751; minimize the diminution to or degradation of the quality or quantity of surface- and ground-water systems; and refrain from significantly altering the normal flow of water in streambeds or drainage channels. No acid- or toxic-forming substances will be used in road surfacing.

All roads will be removed and reclaimed according to Drawings 5-35 and 5-36. The estimated timetable for removing these roads is shown on Drawing 5-38. Cut ditches will

for water level. Additionally, wells LS-85 and SS-30 will be monitored for groundwater operational laboratory water quality measurements.

Additionally two wells in the Lower Robinson Creek alluvium will be monitored for water level and groundwater operational laboratory chemistry. These include UR-70 located above proposed mining locations in the Lower Robinson Creek drainage, and LR-45, located below proposed mining areas adjacent to Lower Robinson Creek. It should be noted that LR-45 is located near a proposed sediment pond impoundment. Consequently, if this well becomes unsuitable for monitoring, an alternate location will be used to monitor the Lower Robinson alluvial groundwater system in this area.

Wells C0-18 and C0-54 are located near the initial proposed mining areas in the Lower Robinson Creek drainage. These will be monitored for water level quarterly.

It should be noted that many of the wells specified for monitoring in this monitoring plan will at some point be destroyed or rendered inoperable as the mine workings precede through the area. These wells will be monitored until such a time as they are destroyed or become inoperable.

The possible need for an additional monitoring well located along the east-west permit boundary in Section 30, T39S, R4W has been evaluated. As described in Section 728.332, based on the laboratory analyses of acid and toxic forming materials in the overburden, coal seam, and underburden, it has been determined that discharges from the mine areas will likely be alkaline in character and acid mine drainage will likely not occur. Similarly, the potential for toxic drainage is not anticipated (see Section 728.332). Additionally, given the general east to northeasterly direction of the bedrock dip in the mine area, groundwater migrating through the pit backfill areas after mining will likely migrate down slope in those same directions (to the east). Because the lower portions of the highwalls surrounding the mine pit areas consist of relatively impermeable Tropic Shale bedrock, the potential for migration of appreciable quantities of groundwater from the mine pit fill areas into surrounding unmined areas is low (see Section 728.320). Shallow alluvial groundwater that could potentially migrate to the west is monitored for laboratory water quality parameters at well LR-45. Surface runoff from these areas is monitored for laboratory water quality parameters at site SW-5, which is located in Lower Robinson Creek below the proposed mining areas. For these reasons, the installation and monitoring of an additional monitoring well is not deemed necessary at this time.

Groundwater and surface-water monitoring will continue through the post-mining periods until bond release. The monitoring requirements, including monitoring sites, analytical parameters and the sampling frequency may be modified in the future in consultation with the Division if the data demonstrate that such a modification is warranted.

731.530 State-appropriated water supply

The proposed water replacement well will be used both as a water supply source for the mine and for water replacement if needed. Alton Coal Development, LLC commits to having the water-replacement well (or other appropriate water replacement source as approved by the Division) drilled and developed before beginning overburden removal for Pits 13, 14, and 15.

732 Sediment Control Measures

Sediment control measures have been designed, constructed and maintained to prevent additional contributions of sediment to streamflow or to runoff outside the permit area.

732.100 Siltation Structures

Siltation structures within the permit area are described in Section 732.200

732.200 Sedimentation Ponds

Four diversion ditches along with five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence and berms are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

Sedimentation ponds have been designed in compliance with the requirements of R645-301-356.300, R645-301-356.400, R645-301-513.200, R645-301-742.200 through R645-301-742.240, and R645-301-763.

No sedimentation ponds or earthen structures that will remain open are planned.

The sedimentation plan has been designed to comply with the MSHA requirements given under R645-301-513.100 and R645-301-513.200.

732.300 Diversions

The runoff control plan is designed to isolate, to the maximum degree possible, runoff from disturbed areas from that of undisturbed areas. Where possible, this has been accomplished by allowing up-stream runoff to bypass the disturbed area, and routing any runoff from undisturbed areas that enter the disturbed area into a sediment control system.

Four diversion ditches along with five sediment impoundments are proposed for the permit area. In addition, miscellaneous controls such as silt fence, berms and temporary diversion ditches are also proposed for specific areas. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2. All temporary ditches will meet the design requirements of Diversion Ditch 4 (designed for the 100-year, 24 hour storm) and will be adjusted within the permitted active mining area in relation to the active pit, currant spoils pile configuration and reclamation.

732.400 Road Drainage

All roads will be constructed, maintained and reconstructed to comply with R645-301-742.400. Road drainage facilities include diversion ditches, culverts, containment berms, and/or water bars. Specific plans for road drainage, road construction, and road maintenance are presented in Chapter 5, Section 534 of this MRP.

A description of measures to be taken to obtain division approval for alteration or relocation of a natural drainage way will be presented to the Division when necessary.

A description of measures to be taken to protect the inlet end of a ditch relief culvert will be submitted to the Division when necessary.

All road drainage diversions will be maintained and repaired to operational condition following the occurrence of a large storm event. Culvert inlets and outlets will be kept clear of sediment and other debris.

733 IMPOUNDMENTS

733.100 General Plans

A professional engineer experienced in the design and construction of impoundments with assistance from a geotechnical expert has used current, prudent, engineering practices to design the proposed impoundments.

The plans have been certified and a detailed geotechnical analysis has been provided in Appendix 5-1. The certifications, drawings and cross sections can be viewed in Drawings 5-25 through 5-31 and Appendices 5-1 and 5-2.

As requested by the Division, the design criteria of the mine site sediment ponds have been reevaluated in light of groundwater that is being encountered at the site (see Appendix 7-11). It was the determination of this reevaluation that the sediment ponds currently in place meet or exceed the minimum requirements of the Utah Coal Mining Rules and that the construction of additional ponds or the redesigning of existing ponds is not required at this time. Accordingly, the small ephemeral channel tributary to Lower Robinson Creek near the toe of the spoils pile mentioned in the Division Deficiency List (Task No. 3799) has been evaluated as a potential sediment pond site, but the construction of a sediment pond in that location is not required at the current time.

As indicated in Section 728.332, where appreciable alluvial groundwater inflows into the mine pit areas occur and where deemed necessary and possible, alluvial groundwater inflows into the mine pit areas will be diverted away from the mine pit areas through

pipes, ditches, or other conveyance methods, minimizing the need for the pumping of mine discharge waters to the sediment ponds. Groundwater that interacts with the Tropic Shale and the Smirl coal seam in the mine pits is considered as mine water and accordingly it will be either routed to Pond #3 or Pond #4 and subsequently discharged under the approved Coal Hollow Mine UPDES discharge permit, or it will be contained and managed within the pit areas and not discharged.

Depending on prevailing climatic conditions and on the nature and quantity of encountered mine waters, at times it may periodically be necessary to discharge water from the Coal Hollow Mine sediment ponds. The discharges from the ponds will occur in compliance with the approved Coal Hollow Mine UPDES permit (see Appendix 7-12).

Five impoundments are proposed to control storm water runoff and sediment from disturbed areas. Each impoundment is designed to contain the run off from a 100 year, 24 hour duration storm event. The locations of the impoundments and the associated watersheds can be viewed on Drawing 5-26. The following table summarizes the final capacity results for each impoundment:

Sedimentation Impoundment Capacities

Structure	Storage Required (ac/ft)	Design Storage* (ac/ft)	Percent of requirement	Additional Storage (ac/ft)
1	2.6	3.1	119	0.5
2	1.7	2.3	135	0.6
3	6.3	7.7	122	1.4
4	5.7	7.5	132	1.8
1B	0.5	0.8	160	0.3

Structure 1 is a rectangular impoundment approximately 136 feet long by 81 feet wide and 9 feet in depth. This impoundment will control storm water run off from the facilities area. The impoundment will be constructed with a 24" drop pipe spillway in order to prevent any oil sheens that may occur from discharging. This impoundment will be incised into the existing ground. Part of the excavated material will be utilized to construct an embankment on the down grade side to provide a minimum of 3 feet freeboard. This pond will control storm water from a watershed of approximately 27 acres. The cleanout and spillway elevation are 6911' and 6920', respectively. The top of the embankment is at elevation 6924'. Details for the design can be viewed on Drawing 5-28.

Structure 1B is a small rectangular impoundment that is approximately 40 feet long by 20 feet wide. This impoundment will control storm water run off from the facilities access road system. The impoundment will be constructed with a 24" drop pipe spillway in order to prevent any oil sheens that may occur from discharging. This impoundment will be incised into the existing ground. Part of the excavated material will be utilized to construct an embankment on the down grade side to provide a minimum of 2 feet freeboard. This pond will control storm water from a watershed of approximately 5 acres. The cleanout and spillway elevation are 6894' and 6906', respectively. The top of

the embankment is at elevation 6908'. Details for the design can be viewed on Drawing 5-28B.

Structure 2 is a rectangular impoundment approximately 188 feet long by 36 feet wide and 9 feet in depth. This impoundment will control storm water runoff from the disturbed areas immediately south of Lower Robinson Creek. The impoundment will be constructed with a 24" drop pipe spillway. Part of the excavated material will be utilized to construct an embankment on the down grade side to provide a minimum 3 feet freeboard. This pond will control storm water runoff from a watershed of approximately 74 acres. The cleanout and spillway elevation are 6891' and 6900', respectively. Top of the embankment is at elevation 6903'. Details for the design can be viewed on Drawing 5-29.

Structure 3 is a valley fill impoundment that will impound an area approximately 484 feet long by 229 feet wide and 9 feet deep. The fill for the impoundment will be constructed from an excavation 198 feet wide by 229 feet long and 8 feet deep. The embankment will be constructed in 2 foot lifts utilizing a dozer. The top of the embankment will be a minimum 12 feet wide. The spillway will be an open channel that will have vegetated slopes. This pond will control storm water runoff from a watershed of approximately 300 acres. The cleanout and spillway elevation are 6802' and 6811', respectively. Top of the embankment is at 6813'. Details for the design can be viewed on Drawing 5-30.

Structure 4 is a rectangular pond located at the south end of the permit area that is approximately 92 feet wide by 628 feet long and 11 feet deep. This impoundment will be incised into the existing ground. Part of the excavation will be used to construct a 12 foot wide embankment. The spillway will be an open channel that will have vegetated slopes. This pond will control storm water runoff from a watershed of approximately 256 acres. The cleanout and spillway elevation are 6823' and 6834', respectively. Top of the embankment is at elevation 6838'. Details for the design can be viewed on Drawing 5-31.

Open channel spillway details for impoundments 3 and 4 are provided in Drawing 5-32. These spillways are designed for emergencies and are not expected to be used during normal operations.

The outer slopes of the impoundments will be sloped to a maximum grade of 3h:1v. Inside slopes will be graded to a maximum 2h:1v. The slopes will be graded and revegetated for erosion control.

No underground mine workings exist near or under the impoundment structures; therefore subsidence surveys are not provided.

Geologic data for the area where impoundments will be located consists of mainly fine grained alluvium with high clay content. Seepage from the impoundments is expected to be minimal based on the high clay content of the existing materials. Characterization of the soils is contained in Chapter 2. Acid and Toxic analysis of the soils indicates that

water seeping through the alluvium layer will not result in reducing water quality. The acid and toxic analysis for the alluvium can be viewed in Appendix 6-2.

Hydrologic data for the permit area is provided in Appendix 7-1. This data indicates that there will be some seepage through the subsurface that may travel to adjacent drainages. The quantities for this seepage are expected to be minimal and will have minimal impact to the overall hydrologic balance. Even though seepage may occur, analysis of the soils indicates that water quality will not be diminished.

The above information provides a summary of all the impoundment structures that are proposed for the Coal Hollow Project. Detailed designs and calculations are provided in this section, Drawings 5-26 through 5-32 and Appendix 5-2. No other impoundments are anticipated.

At some times it may be necessary to discharge water from the sediment ponds. The approved Coal Hollow UPDES permit (Appendix 7-12) allows for discharges.

733.200 Permanent and Temporary Impoundments

All impoundments have been designed and constructed using current, prudent engineering practices and have been designed to comply with the requirements of R645-301-512.240, R645-301-514.300, R645-301-515.200, R645-301-533.100 through R645-301-533.600, R645-301-733.220 through R645-301-733.226, R645-301-743.240, and R645-301-743.

No impoundments or sedimentation ponds meeting the size or other qualifying criteria of MSHA, 30 CFR 77.216(a) exist or are planned within the proposed Mine Permit Area. Should impoundments and sedimentation ponds meeting the size or other qualifying criteria of MSHA, 30 CFR 77.216(a) become necessary, compliance with the requirements of MSHA, 30 CFR 77.216 will be met.

All five planned impoundments have been evaluated by a professional engineer to ensure stability of each structure. The stability analysis performed resulted in a static safety factor of at least 2.2 for each structure. The details for this analysis can be viewed in Appendix 5-1.

No permanent impoundments are planned in the project area.

If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment will promptly inform the Division according R645-301-515.200.

734 Discharge Structures

Discharge structures will be constructed and maintained to comply with R645-301-744.

The proposed impoundments are designed to temporarily store water from storm events and snow melt. Long term standing water in the impoundments is anticipated to be seasonal and sediment will be removed as necessary to provide the required storage capacities. Emergency spillways have been included in the designs to provide a non-destructive discharge route should the capacities ever be exceeded. Surveys of these impoundments will be regularly conducted to ensure that the required design capacities are available.

Impoundments 3 and 4 will be constructed with open channel spillways. These spillways are designed to discharge a 6 hour duration, 100 year storm event even though they are not expected to be used. They will have rip-rap min 6" to minimize erosion and spillway slopes will not exceed 3h:1v. Drawing 5-32 provides the details for the open channel spillways.

Impoundments 1, 1B and 2 will be constructed with a drop pipe spillway system. Storm water and snow melt that occurs within the associated watersheds will be routed to these impoundments to contain sediment. These impoundments will have the drop-pipe spillways installed which will allow removal of any oil sheens that may result from parking lots, primary roads or maintenance activities by using absorbent materials to remove the sheen. The drop-pipe spillways are 24" diameter pipes that are vertical in the impoundment. These pipes have a metal cover over the end. This cover is recessed over the pipe by at least an inch, with a gap between the cover and the pipe. This leaves a route for water to discharge once the impoundment is full but prevents debris or pollutants located on the water surface from discharging. This system was chosen for these three impoundments based on their locations in relation to the facilities and primary roads. This discharge system will be constructed for precautionary measures only since pollutants are not expected in the impoundments during normal operations.

Disposal of Excess Spoil

Areas designated for the disposal of excess spoil and excess spoil structures will be constructed and maintained to comply with R645-301-745.

Details of proposed excess spoil disposal plans are presented in Chapter 5, Section 535 of this MRP and are summarized below.

A geotechnical analysis has been completed for the proposed excess spoil structure. This analysis estimates the long-term safety factor to be 1.6 to 1.7 based on the proposed design. Following proper construction practices of building the structure in maximum four foot lifts and meeting 85% compaction based on the standard Procter will ensure that the structure will be stable under all conditions of construction. This construction will occur only in the designated excess spoil area as shown on Drawing 5-3 and 5-35. The fill will be placed with end dump haul trucks and lifts will be constructed using dozers. High precision GPS systems will be regularly utilized to check grades and appropriate lift thickness. The geotechnical analysis for this structure can be viewed in Appendix 5-1.

The excess spoil is planned to be placed in an area where natural grades range from 0 to 5%. This is one of the most moderately sloping locations in the Permit Area. Stability of this structure is estimated to be 1.6 to 1.7 based on the Appendix 5-1.

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix 5-1.

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix 5-1 details the stability analysis for the proposed structure.

Excess spoil will not be disposed of in underground mine workings.

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 85% of the standard Procter. The geotechnical analysis (Appendix 5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

A description of the character of the bedrock and any adverse geologic conditions in presented in Appendix 5-1.

Spring and seep survey information is provided on Drawing 7-1. There are no springs or seeps identified in the excess spoil area.

There are no historical underground mining operations in the proposed excess spoil area. There are also no future underground operations proposed.

There are no rock chimneys or drainage blankets proposed.

A stability analysis including strength parameters, pore pressures and long-term seepage conditions is presented together with all supporting data in Appendix 5-1.

Neither rock-toe buttresses nor key-way cuts are required under R645-301-535.112 or R645-301-535.113.

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

No durable rock fills are proposed.

No disposal of waste on preexisting benches is planned

The excess spoil structure and fill above approximate original contour are the only alternative specifications proposed. A geotechnical analysis has been completed for this proposal and can be viewed in Appendix 5-1. All other mined areas will be restored to approximate original contour.

735 Coal Mine Waste

Areas designated for disposal of coal mine waste and coal mine waste structures will be constructed and maintained to comply with R645-301-746.

No structures for the disposal of coal mine waste are planned.

736 Noncoal Mine Waste

Noncoal mine waste will be stored and final disposal of noncoal mine waste will comply with R645-301-747

Noncoal mine waste, including but not limited to grease, lubricants, paints, flammable liquids, garbage, machinery, lumber and other combustible materials generated during coal mining and reclamation operations will be temporarily stored in a controlled manner. Final disposal of noncoal mine wastes will consist of removal from the project area and transportation to a State-approved solid waste disposal area.

Only sizing of the coal is proposed. This process will not produce any waste.

At no time will any noncoal mine waste be deposited in a refuse pile or impounding structure, nor will any excavation for a noncoal mine waste disposal site be located within eight feet of any coal outcrop or coal storage area.

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.

Debris, acid-forming, toxic-forming materials and materials constituting a fire hazard will be identified and 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. Appropriate measures will be implemented to preclude sustained combustion of such materials.

Plans do not include using dams, embankments or other impoundments for disposal of coal, overburden, excess spoil or coal mine waste.

738 Temporary Casing and Sealing of Wells

Wells constructed for monitoring groundwater conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of groundwater and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Drawing 7-11. Monitoring wells will include a protective hydraulic seal immediately above the screened interval, an annular seal plugging the borehole above the hydraulic seal to near the ground surface, and a concrete surface seal extending from the top of the hydraulic seal to the ground surface which is sloped away from the well casing to prevent the entrance of surface flows into the borehole area. Well casings will protrude above the ground surface a sufficient height so as to minimize the potential for the entrance of surface water or other material into the well. A steel surface protector with a locking cover will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, the wells will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of "Administrative Rules for Water Well Drillers", State of Utah, Division of Water Rights or other applicable state regulations. Abandonment of wells will be performed by a licensed water well driller. The wells to be abandoned will be completely filled using neat cement grout, sand cement grout, unhydrated bentonite, or bentonite grout, or other materials approved by the Utah State Engineer's office. Alternatively, the well may be abandoned using a different procedure upon approval from the Utah State Engineer's office.

Abandonment materials will be introduced at the bottom of the well or required sealing interval and placed progressively upward to the top of the well. The casing will be severed a minimum of 2 feet below the ground surface. A minimum of 2 feet of compacted native material will be placed above the abandoned well upon completion.

Within 30 days of the completion of well abandonment procedures, a report will be submitted to the State Engineer by the responsible licensed driller giving data related to the

abandonment of the well. This shall include the name of the licensed driller or other person(s) performing abandonment procedures, name of well owner at the time of abandonment, the address or location of the well by section, township, and range, abandonment materials and equipment used, water right or file number covering the well, the final disposition of the well, and the date of completion.

Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.

If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

Sedimentation Impoundment Capacities				
Structure	Storage Required (ac/ft)	Design Storage* (ac/ft)	Percent of requirement	Additional Storage (ac/ft)
1	2.6	3.1	119	0.5
2	1.7	2.3	135	0.6
3	6.3	7.7	122	1.4
4	5.7	7.5	132	1.8
1B	0.5	0.8	160	0.3

Structure 1 is a rectangular impoundment approximately 136 feet long by 81 feet wide and 9 feet in depth. This impoundment will control storm water run off from the facilities area. The impoundment will be constructed with a 24" drop pipe spillway in order to prevent any oil sheens that may occur from discharging. This impoundment will be incised into the existing ground. Part of the excavated material will be utilized to construct an embankment on the down grade side to provide a minimum of 4 feet freeboard. This pond will control storm water from a watershed of approximately 27 acres. The cleanout and spillway elevation are 6911' and 6920', respectively. The top of the embankment is at elevation 6924'. Details for the design can be viewed on Drawing 5-28.

Structure 1B is a small rectangular impoundment that is approximately 40 feet long by 20 feet wide. This impoundment will control storm water run off from the facilities access road system. The impoundment will be constructed with a 24" drop pipe spillway in order to prevent any oil sheens that may occur from discharging. This impoundment will be incised into the existing ground. Part of the excavated material will be utilized to construct an embankment on the down grade side to provide a minimum of 2 feet freeboard. This pond will control storm water from a watershed of approximately 5 acres. The cleanout and spillway elevation are 6894' and 6906', respectively. The top of the embankment is at elevation 6908'. Details for the design can be viewed on Drawing 5-28B.

Structure 2 is a rectangular impoundment approximately 188 feet long by 36 feet wide and 9 feet in depth. This impoundment will control storm water runoff from the disturbed areas immediately south of Lower Robinson Creek. The impoundment will be constructed with a 24" drop pipe spillway. Part of the excavated material will be utilized to construct an embankment on the down grade side to provide a minimum 3 feet freeboard. This pond will control storm water runoff from a watershed of approximately 74 acres. The cleanout and spillway elevation are 6891' and 6900', respectively. Top of the embankment is at elevation 6903'. Details for the design can be viewed on Drawing 5-29.

Structure 3 is a valley fill impoundment that will impound an area approximately 484 feet long by 229 feet wide and 9 feet deep. The fill for the impoundment will be constructed from an excavation 198 feet wide by 229 feet long and 8 feet deep. The embankment will be constructed in 2 foot lifts utilizing a dozer. The top of the embankment will be a minimum 12 feet wide. The spillway will be an open channel that will have vegetated

742.221.32 The sedimentation ponds are designed to provide detention for a 100 year, 24 hour duration storm event. Calculations for this design can be viewed in Appendix 5-2. This design standard is expected to keep discharges from the structure at a minimum and allow adequate settlement time to meet Utah and federal effluent limitations. In the event it becomes necessary to decant water to satisfy the required storage volumes, ACD will use a 4" gasoline driven pump to decant excess water. Water will be required to remain in the pond for a minimum of 24 hours prior to the beginning of decant operations and be discharged through the discharge point approved under UPEDES permit No. UTG04027 following all applicable monitoring protocol under this permit.

742.221.33 The sedimentation ponds are designed for a 100 year, 24 hour storm event which significantly exceeds a 10 year, 24 hour precipitation event. The 100 year, 24 hour event in the Alton area is 3.1 inches of precipitation. The 10 year, 24 hour precipitation event in this same location is approximately 2.0 inches of precipitation. The design standard used for the Coal Hollow project is 155% of the precipitation for the required "design event".

742.221.34 Each pond will be constructed with an emergency spillway, should the capacities of the ponds ever be exceeded. These spillways will provide a nondestructive route for storm water discharge, though the capacities of the ponds are not expected to be exceeded. The design capacities of the ponds are expected to contain each storm event and therefore will provide sufficient detention time to meet Utah and federal effluent limitations. The following is a description of each spillway:

Impoundments 3 and 4 will be constructed with open channel spillways. These spillways are designed to discharge a 24 hour duration, 100 year storm event even though they are not expected to be used during normal operations. They will have rip-rap min. 6" to minimize erosion and spillway slopes will not exceed 3h:1v. Drawing 5-32 provides the details for the open channel spillways.

Impoundments 1, 1B and 2 will be constructed with a drop pipe spillway system. Storm water and snow melt that occurs within the associated watersheds will be routed to these impoundments to contain sediment. These impoundments will have the drop-pipe spillways installed which will allow removal of any oil sheens that may result from parking lots, primary roads or maintenance activities by using absorbent materials to remove the sheen. The drop-pipe spillways are 24" diameter pipes that are vertical in the impoundment. These pipes have a metal cover over the end. This cover is recessed over the pipe by at least an inch, with a gap between the cover and the pipe. This leaves a route for water to

discharge once the impoundment is full but prevents debris or pollutants located on the water surface from discharging. This system was chosen for these two impoundments based on their locations in relation to the facilities and primary roads. This discharge system will be constructed for precautionary measures only since pollutants are not expected in the impoundments during normal operations.

742.221.35 Regular inspections of the sediment pond system during construction and operations will identify any deficiencies that could cause short circuiting. Design standards for the system will ensure proper functioning during extreme storm events which makes it highly unlikely that issues related to short circuiting could occur during normal operations.

742.221.36 Surveys of the pond system will be conducted at least annually. These surveys will be compared against the required "design event" capacity for each pond. Sediment removal will occur as needed to maintain the required capacity.

742.221.37 Geologic conditions in the areas where sediment ponds will be constructed are suitable to the proposed use. Excessive settling of the ponds is not expected based on the high clay content of the soils. Embankments will be constructed in maximum two foot lifts to promote compaction during the construction process, reducing settling during operations. Supporting data for compaction can be viewed in Appendix 5-1.

742.221.38 Any sod, large roots, and/or frozen soil will be removed from sedimentation ponds. No coal processing will be conducted as part of the Coal Hollow Project; therefore wastes from this type of process will not be present.

742.221.39 Embankments will be constructed in maximum two foot lifts to promote compaction during the construction process, reducing settling during operations. Supporting data for this compaction method can be viewed in Appendix 5-1.

742.222 Sedimentation ponds for the Coal Hollow Project do not meet the size or other qualifying standard for MSHA, 30 CFR 77.216(a).

742.223 Each sedimentation pond will be constructed with a spillway that will function as both the emergency and principle spillway. Each of these spillways will safely discharge a 25 year, 6 hour precipitation event. The following table summarizes the spillway discharge designs in relation to the 25 year, 6 hour precipitation event:

Sediment Impoundment – Spillway Flow Capacities		
Impoundment	Required Spillway Discharge (cfs)	Designed Spillway Discharge (cfs)
1	30.4	37.4
2	0.8	30.5
3	2.8	11.5
4	2.4	11.5
1B	6.06	23.9

The drop pipe spillways for impoundments 1, 1B and 2 will be of nonerodible construction. The open channel spillways for impoundments 3 and 4 will be rip-rap min. 6" and are designed to carry short-term, infrequent flows at non erosive velocities where sustained flows are not expected.

742.224 Either the requirements of 742.223.1 or 742.223.2 will be met for each sediment impoundment.

742.225 No exceptions to the sediment pond location guidance are requested

742.230 Other Treatment Facilities

If other treatment facilities become necessary, they will be designed to treat the 10-year, 24-hour precipitation event unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and a demonstration by the operator that the effluent limitations of R645-301-751 will be met.

No other treatment facilities are planned for the Coal Hollow Project.

742.240 Exemptions

Not Applicable

742.300 Diversions

742.310 General Requirements

742.311 There are no flows from mined areas that have been abandoned prior to May 3, 1978 at the Coal Hollow Project. Diversions at the Coal Hollow Project are planned to minimize water from disturbed areas from directly discharging into drainages without first being treated and to also prevent water from upland, adjacent areas from entering the project area. Four temporary diversion ditches are planned and one temporary diversion of Lower Robinson Creek. Two diversions will be primarily used to route water from upland, undisturbed areas away from the planned disturbed areas. Diversion ditch 2 has been split to minimize the amount of water from upland routed to Pond 2 (see drawing 5-34), 2B will route water

from upland to Lower Robinson Creek and 2A will route water from disturbed area to Pond 2. Diversion ditch 4 is planned to direct water from disturbed areas into sediment impoundment Pond 4. The temporary diversion of Lower Robinson Creek is for maximum recovery of coal and will route flows around the mining area. Each temporary diversion has been designed to only carry runoff from areas that will or potentially could be affected by the mining operations, except Lower Robinson Creek diversion which will carry intermittent flows from the upstream watershed. Diversion locations were selected to generally carry runoff to the drainage paths that the precipitation would originally follow. These parameters were followed in the designs to minimize impacts to the overall hydrological balance within the permit and adjacent areas. Diversions will not be used to route water into underground mines. Specific design parameters are discussed in the following sections (R645-301-742.312.1 to 742.314).

742.312 Each diversion was designed to ensure stability and to minimize erosion. In order to accomplish this standard, the diversions were each designed for peak flows during a 100 year, 24 hour storm event. The following summarizes the steps used:

The channel sizing for the four proposed temporary diversion ditches has been evaluated using the TR-55 method to determine peak flows and the Manning's Equation (ME) to determine appropriate dimensions. The TR-55 method of analysis is the same method used to size impoundments and was utilized in this case to provide a peak flow for each diversion during a 100 year, 24 hour storm event. This peak flow was then input into the ME to determine an appropriate open channel design for minimizing the effects of erosion during peak flows. Similar to the impoundment sizing, the Carlson Software Hydrology module was utilized to perform these calculations. The ditch locations, designs and cross sections can be viewed on Drawings 5-33 and 5-34.

The following table summarizes the inputs and results for each diversion based on flows during a 100 year, 24 hour storm event:

Diversion Ditch Summary							
Ditch	*Base (ft)	Manning's n	Average Slope (%)	Peak Flow (cfs)	Flow Depth (ft)	Velocity (fps)	Freeboard (ft)
1	3.0	0.020	2.8	14.8	0.5	6.8	0.3
2	2.5	0.020	3.5	6.9	0.4	6.0	0.3
3	4.5	0.020	2.4	16.7	0.5	6.3	0.3
4	5.0	0.020	1.8	19.8	0.6	5.4	0.3

*All side slopes are 2h:1v

As shown in the above table, flow depths will be shallow, flow velocity will be manageable for temporary flow conditions and sufficient freeboard will be present during a flood event. These conditions will provide diversion stability, protection against flooding and prevent to the extent possible additional contributions of suspended solids to streamflow outside the permit area. These diversions are designed to comply with all applicable local, Utah and federal laws and regulations. Further details related to the temporary diversion designs can be viewed in Appendix 5-2.

Based on the size of the watershed for Lower Robinson Creek, a different method of analysis was used than the method used for the other diversions. The HEC-1 program was used for this analysis and extra erosion protection has been included as part of the design. The channel was designed to safely handle the flows from a 100 year, 6 hour storm event. This diversion will be further discussed in section 742.320 Diversion of Perennial and Intermittent Streams.

742.313 The four temporary diversions will be reclaimed when they are no longer necessary. This will occur once final reclamation is determined to be sufficient within the project area and the sediment impoundments are no longer needed. This is anticipated to occur in the fourth year of operations.

The Lower Robinson Creek temporary diversion will be constructed in a responsible manner. This diversion will experience some erosion during flood events but erosion rates are expected to be generally less than those in the original channel above and below the diversion. The detailed design for this diversion can be viewed in Drawings 5-20 and 21. Calculations related to this diversion design can be viewed in Appendix 5-3.

742.320 Diversion of Perennial and Intermittent Streams.

742.321 Temporary diversion of one intermittent stream is planned for the Coal Hollow Project. The planned diversion is in a length of the stream that appreciable flows only occur during storm events and snow melt periods. This diversion is necessary to recover coal located in the northwest corner of the project area. The diversion would provide mining in an area that is 22 acres and contains approximately 400,000 tons of recoverable coal. Without this diversion, most of this area could not be mined.

742.322 The original unmodified channel immediately upstream and downstream from the Lower Robinson Creek diversion has excessive erosion and is not in stable condition. The channel has incised deeply and has developed into a channel that has a capacity significantly greater than any anticipated

storm events. Since these conditions are not desirable for the area, the diversion design instead has dimensions that are suitable to pass a 100 year, 6 hour storm event in compliance with R645-301-742.323.

742.323 The temporary Lower Robinson Creek diversion has been designed to safely pass a 100 year, 6 hour storm event. The watershed for this drainage is 3.64 square miles and has a peak flow of 83.5 cubic feet per second during a 100 year, 6 hour event. Minimum dimensions for carrying this flow was found to be a channel that has the following dimensions:

Bottom width: 2 feet
Side slopes: 3h:1v
Minimum slope height: 3 feet (1 foot freeboard added)

Details related to the design calculations are provided in Appendix 5-3. Rip-rap will be appropriately placed to minimize erosion of the channel.

Cross sections of the channel design are shown in Drawing 5-21. As shown in the drawing, all sections of the diversions exceed the minimum design standard. A plan view of the diversion design can be viewed in Drawing 5-20.

742.324 Design of the Lower Robinson Creek Diversion has been certified by a qualified registered professional engineer.

742.330 Diversion of Miscellaneous Flows.

742.323

As part of the reclamation process, Lower Robinson Creek will be reconstructed to its approximate original location. The design for this reconstruction is shown on Drawings 5-20A and 5-21A. This design includes considerable improvements to the channel compared to the channel's current condition. The current condition is such that less than 25% of the channel within the disturbed area has a flood plain present and most of the slopes are near the angle of repose with fair to poor vegetative cover. The reconstructed sides of the channel for the entire length reconstructed. Sharp corners in the original alignment have been rounded to sinuous curve shapes and rip-rap will be installed in the bottom section of the channel to minimize erosion. The flood plain will be seeded and covered with erosion matting to control erosion until natural vegetative condition can be attained.

742.331 Diversion of miscellaneous flows is planned using four diversion ditches. Two diversions will be primarily used to route runoff from upland, undisturbed areas away from the planned disturbed areas. Diversion ditch

2 has been split to minimize the amount of water from upland routed to Pond 2 (see drawing 5-34), 2B will route water from upland to Lower Robinson Creek and 2A will route water from disturbed area to Pond 2. Diversion ditch 4 is planned to direct water from disturbed areas into sediment impoundment Pond 4. The locations of these diversions along with the associated watersheds can be viewed on Drawings 5-27, 5-33 and 5-34. Calculations related to the diversions can be viewed in Appendix 5-2.

742.332 Each diversion was designed for stability and to minimize erosion. In order to accomplish this standard, the diversions were each designed for peak flows during a 100 year, 24 hour storm event. The following summarizes the steps used:

The channel sizing for the four proposed temporary diversion ditches has been evaluated using the TR-55 method to determine peak flows and the Manning's Equation (ME) to determine appropriate dimensions. The TR-55 method of analysis is the same method used to size impoundments and was utilized in this case to provide a peak flow for each diversion during a 100 year, 24 hour storm event. This peak flow was then input into the ME to determine an appropriate open channel design for minimizing the effects of erosion during peak flows. Similar to the impoundment sizing, the Carlson Software Hydrology module was utilized to perform these calculations. The ditch locations, designs and cross sections can be viewed on Drawings 5-33 and 5-34.

The following table summarizes the inputs and results for each diversion based on peak flows during a 100 year, 24 hour storm event:

Diversion Ditch Summary							
Ditch	*Base (ft)	Manning's n	Average Slope (%)	Peak Flow (cfs)	Flow Depth (ft)	Velocity (fps)	Freeboard (ft)
1	3.0	0.020	2.8	14.8	0.5	6.8	0.3
2	2.5	0.020	3.5	6.9	0.4	6.0	0.3
3	4.5	0.020	2.4	16.7	0.5	6.3	0.3
4	5.0	0.020	1.8	19.8	0.6	5.4	0.3

*All side slopes are 2h:1v

As shown in the above table, flow depths will be shallow, flow velocity will be manageable for temporary flow conditions and sufficient freeboard will be present during a flood event. These conditions will provide diversion stability, protection against flooding and prevent to the extent possible additional contributions of suspended solids to stream flow outside the permit area. These diversions are designed to comply with all applicable local, Utah and federal laws and regulations. Further

details related to the temporary diversion designs can be viewed in Appendix 5-2.

742.333 All four miscellaneous flow diversions planned for the project are temporary and will be reclaimed when no longer necessary for sediment and storm water control. Therefore, the channels must safely pass the peak runoff from a 2 year, 6 hour event. As previously described, these diversions have been designed to pass a 100 year, 24 hour storm event which significantly exceeds this required design standard. Precipitation from a 100 year, 24 hour storm event for this area is 3.1 inches while precipitation for the 2 year, 6 hour event is less than 1 inch.

742.400 Road Drainage

742.410 All Roads

742.411 To ensure environmental protection and safety appropriate for the planned duration and use, limits have been incorporated in the road designs for the Coal Hollow Project. These limits are applied to drainage control and culvert placement/sizing. These limits take into consideration the type and size of equipment planned for the operation. The following is a description of roads along with the design limits and standards that will be incorporated into construction:

Two primary Mine Haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to pits 1 through 15 (pits shown on Drawing 5-10). This road will be approximately 2,600 feet in length and will be utilized mainly during the first two years of mining. There will be three culverts installed along this road all sized for a 100 year, 6 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix 5-3. The third culvert is a crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe.

The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds south to approximately pit 25. This road is approximately 2,500 feet in length and will be used for the south pits 16 through 30. There is one culvert

crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert.

The following specifications apply to these two Primary Mine Haul roads:

1) Roads will be approximately 80' in width
2) Approximately a 2% crown
3) Approximately one foot deep cut ditches along shoulders for controlling storm water
4) 18" of crushed rock or gravel for road surfacing
5) Cut and fill slopes of 1.5h:1v
6) Minimum fill over each culvert will be 2 times diameter of culvert
7) Berms placed as necessary along fills

The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width.

The location and details for all these roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

In addition to the two primary Mine Haul roads, the road located within the facilities area is also classified as a primary road. This road is planned to be 24 feet wide with 24 inches of compacted sub base and 8 inches of compacted 1 inch minus gravel as surfacing. This road system will have six culverts and selectively located berms to appropriately route water to the two sediment impoundments for the facilities area. The location of these culverts and berms is shown on Drawing 5-3. This road is referred to as "Facilities Roadway" and more details are described in 527.200 along with Drawings 5-22A and 5-22B.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

All roads will be maintained on an as needed basis using motor graders, water trucks for dust suppression, and other equipment as necessary. Crushed stone and/or gravel will be used as a surface course for primary roads outside the active mining area, and may be used as needed for ramps and travelways within the pit. Should the roads be damaged by a catastrophic event, such as an earthquake or a flood, repairs will be made as soon as possible after the damage has occurred or the road will be closed and reclaimed.

Cut and fill slopes along the primary roads will be minimal and are not expected to cause significant erosion. The water from roads in the project area will not directly discharge to drainages outside the project area without first being treated by flowing through a sediment impoundment. In locations where there are culvert crossings (i.e. Lower Robinson Creek), the fills slopes will be stabilized by utilizing standard methods such as grass matting or straw wattles.

742.412 No roads will be located in the channel of an intermittent or perennial stream.

742.413 Primary roads constructed utilized during mining operations have been designed and located to route runoff from the roads to the sediment impoundment system. By routing the runoff to this system, sedimentation and flooding downstream resulting from the roads will be minimized. All other roads located within the active mining area will also follow this standard and runoff from the roads will not be directly discharged to drainages outside the permit area.

742.420 Primary Roads

742.421 To minimize erosion, primary roads will be constructed with a rock surface with minimal cut and fill slopes. These roads are located in the most practicable, stable areas within the permit boundary and mostly outside of the designed pits. These locations can be reviewed on Drawing 5-22 through 5-22G. Further descriptions of these roads can be viewed in Section 742.423.1 and 742.111.

742.422 There are no stream fords by primary roads at the Coal Hollow Project.

742.423 Drainage Control

- 742.423.1 Two primary Mine Haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to pits 1 through 15 (pits shown on Drawing 5-10). This road will be approximately 2,600 feet in length and will be utilized mainly during the first two years of mining. There will be three culverts installed along this road all sized for a 100 year, 24 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix A5-3. The third culvert is crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe.

The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds south to approximately pit 25. This road is approximately 2,500 feet in length and will be used for the south pits 16 through 30. There is one culvert crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert sized for maximum anticipated flows in the diversion.

The following specifications apply to these Primary mine haul roads:

1) Roads will be approximately 80' in width
2) Approximately a 2% crown
3) Approximately one foot deep cut ditches along shoulders for controlling storm water
4) 18" of crushed rock or gravel for road surfacing
5) Cut and fill slopes of 1.5 h:1v
6) Minimum fill over each culvert will be 2 times diameter of culvert
7) Berms placed as necessary along fills

The location and details for Primary Mine Haul roads can be viewed on Drawings 5-3 and 5-22 and 5-23.

In addition to the two roads primary Mine Haul roads, the road located within the facilities area is also classified as a primary road. This road is planned to be 24 feet wide with 24 inches of compacted sub base and 8 inches of compacted 1 inch minus gravel as surfacing. This road system will have four culverts and selectively located berms appropriately placed to route water to the two sediment impoundments for the facilities area. The location of these culverts and berms is shown on Drawing 5-3. This road is referred to as "Facilities Roadway" and more details are described in 527.200 along with Drawings 5-22A and 5-22B.

In addition to the primary roads that will be present during active mining, four additional roads are planned to exist postmining and are also classified as primary roads for this reason.

Roads that will remain postmining are the following:

- Road to Water Well with details shown on Drawing 5-22D
- Road to east C. Burton Pugh property with details shown on Drawing 5-22C
- County Road 136 (K3900) with details on Drawing 5-22E, 5-22F and 5-22G. This County road will be reconstructed within the permit area by Kane County. This reconstruction will occur concurrently with the final stage of reclamation as scheduled on Drawing 5-38 and is expected to be completed by the end of Year 4.
- Road to Swapp Ranch (same specification as the Water Well Road)

The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography. With the exception of the County Road, each road will be graded

to complement the surrounding topography and drainages. Details for these roads are provided in the above referenced drawings.

County Road 136 will have a cut ditch on the up gradient side of the road as appropriate. The culvert located at the crossing of Lower Robinson Creek will remain. One culvert will be added at Station 21+66 as shown on Drawing 5-22E. For further details related to reestablishment of County Road 136, refer Drawings 5-22 through 5-22G and 5-35.

742.423.2 Drainage pipes and culverts will be constructed on a minimum 2% grade to avoid plugging. Minimum fill over culverts will be 2 times the diameter of the culvert itself to avoid collapsing. Grades going in and out of each culvert will be similar to the grade of the culvert itself to avoid erosion at the inlet and outlet.

742.423.3 Drainage ditches have been designed to pass a 100 year 24 hour storm event which will prevent uncontrolled drainage over the road surface and embankment. The watersheds associated with drainage in the project area are each relatively small (less than 400 acres) and are not expected to sustain flows that would carry significant debris through the project area. Therefore, trash racks and debris basins are not expected to be necessary at the Coal Hollow Project.

742.423.4 One natural intermittent stream channel is planned to be diverted. This channel is referred to as Lower Robinson Creek and this diversion will be temporary. A section of this stream runs across an area that is planned for mining.

The Lower Robinson Creek diversion has been designed to safely pass a 100 year, 6 hour storm event. The watershed for this drainage is 3.64 square miles and has a peak flow of 83.5 cubic feet per second during a 100 year, 6 hour event. Minimum dimensions for carrying this flow were found to be a channel that has the following dimensions:

Bottom width: 2 feet
Side slopes: 3h:1v
Minimum slope height: 3 feet (1 foot freeboard added)

Details related for the design calculations are provided in Appendix 5-3. Rip-rap will be appropriately placed to minimize erosion of the channel.

Cross sections of the channel design are shown in Drawing 5-21. As shown in the drawing, all sections of the diversions exceed the minimum design standard. A plan view of the diversion design can be viewed in Drawing 5-20. This diversion design is in accordance with

to complement the surrounding topography and drainages. Details for these roads are provided in the above referenced drawings.

County Road 136 will have a cut ditch on the up gradient side of the road as appropriate. The culvert located at the crossing of Lower Robinson Creek will remain. One culvert will be added at Station 21+66 as shown on Drawing 5-22E. For further details related to reestablishment of County Road 136, refer Drawings 5-22 through 5-22G and 5-35.

742.423.2 Drainage pipes and culverts will be constructed on a minimum 2% grade to avoid plugging. Minimum fill over culverts will be 2 times the diameter of the culvert itself to avoid collapsing. Grades going in and out of each culvert will be similar to the grade of the culvert itself to avoid erosion at the inlet and outlet.

742.423.3 Drainage ditches have been designed to pass a 100 year 24 hour storm event which will prevent uncontrolled drainage over the road surface and embankment. The watersheds associated with drainage in the project area are each relatively small (less than 400 acres) and are not expected to sustain flows that would carry significant debris through the project area. Therefore, trash racks and debris basins are not expected to be necessary at the Coal Hollow Project.

742.423.4 One natural intermittent stream channel is planned to be diverted. This channel is referred to as Lower Robinson Creek and this diversion will be temporary. A section of this stream runs across an area that is planned for mining.

The Lower Robinson Creek diversion has been designed to safely pass a 100 year, 6 hour storm event. The watershed for this drainage is 3.64 square miles and has a peak flow of 83.5 cubic feet per second during a 100 year, 6 hour event. Minimum dimensions for carrying this flow were found to be a channel that has the following dimensions:

Bottom width: 2 feet
Side slopes: 3h:1v
Minimum slope height: 3 feet (1 foot freeboard added)

Details related for the design calculations are provided in Appendix 5-3. Rip-rap will be appropriately placed to minimize erosion of the channel.

Cross sections of the channel design are shown in Drawing 5-21. As shown in the drawing, all sections of the diversions exceed the minimum design standard. A plan view of the diversion design can be viewed in Drawing 5-20. This diversion design is in accordance with

R645-301-731.100 through R645-301-731.522, R645-301.600, R645-301-731.800, R645-301-742.300, and R645-301-751.

Design of the Lower Robinson Creek Diversion has been certified by a qualified registered professional engineer.

742.423.5 All stream crossings are planned to be culverts designed to pass the 100 year, 6 hour storm event. There are no plans to use fords as stream crossings.

743 IMPOUNDMENTS

743.100 General Requirements

Five temporary impoundments are planned at the Coal Hollow Project. Design for these structures are shown in Drawings 5-28 through 5-32. These impoundments do not meet the criteria for Class B or C dams as specified in the U.S. Department of Agriculture, Natural Resources Conservation Service Technical Release 60.

743.110 None of the impoundments meet the criteria of MSHA, 30 CFR 77.216(a).

743.120 A professional engineer experienced in the design and construction of impoundments with assistance from a geotechnical expert has used current, prudent, engineering practices to design the proposed impoundments.

The plans have been certified and a detailed geotechnical analysis has been provided in Appendix 5-1. The certifications, drawings and cross sections can be viewed in Drawings 5-25 through 5-31 and Appendices 5-1 and 5-2.

Each impoundment is designed with a minimum freeboard of 2 feet. Based on the size of the impoundments and the relatively small size of the associated watersheds, this amount of freeboard will be sufficient to prevent overtopping from waves and/or storm events. These impoundments do no meet the criteria for Class B or C dams.

743.130

Each impoundment will be constructed with a spillway that will function as both the emergency and principle spillway. Each of these spillways will safely discharge a 25 year, 6 hour precipitation event. The following table summarizes the spillway discharge designs in relation to the 25 year, 6 hour precipitation event:

Sediment Impoundment – Spillway Flow Capacities		
Impoundment	Required Spillway Discharge (cfs)	Designed Spillway Discharge (cfs)
1	30.4	37.4
2	0.8	30.5
3	2.8	11.5

4	2.4	11.5
1B	6.06	23.9

The drop pipe spillways for impoundments 1, 1B and 2 will be of nonerodible construction. The open channel spillways for impoundments 3 and 4 will be grass lined and are designed to carry short-term, infrequent flows at non erosive velocities where sustained flows are not expected.

The impoundments at the Coal Hollow project do not meet the criteria for either Class B or C dams or MSHA CFR 77.216 (a).

743.140

A professional engineer or specialist experienced in the construction of impoundments will inspect impoundments. Inspections will be made regularly during construction, upon completion of 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. A copy of the report will be retained at or near the mine site.

The MRP does not contemplate construction of any impoundments meeting the NRCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Sec. 77.216.

743.200

No permanent impoundments are planned.

743.300

Design capacities for spillways exceed the 25 year, 6 hour event. The design capacities are provided in the table located in section R645-301-743.130.

744 DISCHARGE STRUCTURES

744.100

Each pond will be constructed with an emergency spillway, should the capacities of the ponds ever be exceeded. These spillways will provide a nondestructive route for storm water discharge, though the capacities of the ponds are not expected to be exceeded. The design capacities of the ponds are expected to contain each storm event and therefore will

of the fill; and adequately cover or treat excess spoil that is acid- and toxic-forming with nonacid nontoxic material to control the impact on surface and ground water is accordance with R645-301-731.300 and to minimize adverse effects on plant growth and the approved postmining land use.

If the disposal area contains springs, natural or manmade water courses or wet weather seeps, the fill design will include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill and ensure stability.

Details of proposed excess spoil disposal plans are presented in Chapter 5, Section 535 of this MRP and are summarized below.

A geotechnical analysis has been completed for the proposed excess spoil structure. This analysis estimates the long-term safety factor to be 1.6 to 1.7 based on the proposed design. Following proper construction practices of building the structure in maximum four foot lifts and meeting 85% compaction based on the standard Procter will ensure that the structure will be stable under all conditions of construction. This construction will occur only in the designated excess spoil area as shown on Drawing 5-3 and 5-35. The fill will be placed with end dump haul trucks and lifts will be constructed using dozers. High precision GPS systems will be regularly utilized to check grades and appropriate lift thickness. The geotechnical analysis for this structure can be viewed in Appendix 5-1.

The excess spoil is planned to be placed in an area where natural grades range from 0 to 5%. This is one of the most moderately sloping locations in the Permit Area. Stability of this structure is estimated to be 1.6 to 1.7 based on the Appendix 5-1.

Geotechnical borings were completed in the foundation of the proposed disposal area. Laboratory analysis of these borings has also been completed. Details of this analysis can be viewed in Appendix 5-1.

Permanent slopes for the proposed excess spoil will not exceed 3h:1v (33 percent), therefore no keyway cuts have been proposed in the design. Appendix 5-1 details the stability analysis for the proposed structure.

Excess spoil will not be disposed of in underground mine workings.

Horizontal lifts will not exceed four feet in thickness unless otherwise approved by the Division. The lifts will be concurrently compacted to meet 85% of the standard Procter. The geotechnical analysis (Appendix 5-1), provides information showing that these construction standards will provide mass stability and will prevent mass movement during and after construction. The excess spoil will be graded to provide drainage similar to original flow patterns. Topsoil and subsoil as designated in Chapter 2 will be removed and separated from other materials prior to placement of spoil.

A description of the character of the bedrock and any adverse geologic conditions in presented in Appendix 5-1.

Table 7-9 Estimated rates of groundwater inflows based on drilling and slug testing results.

	Saturated alluvial thickness (feet)	Hydraulic conductivity; Clayey alluvium (cm/sec)	Clayey alluvium thickness (feet)	Hydraulic conductivity; Silty alluvium (cm/sec)	Silty alluvium thickness (feet)	Hydraulic conductivity; Coal burn (cm/sec)	Coarse alluvium thickness (feet)	Hydraulic gradient	Discharge per 100 linear feet over saturated thickness (gpm)
Lower Robinson Creek									
C0 area	34	$< 1 \times 10^{-6}$	34	NA	0	NA	0	0.10	< 1
C1 area	6	$< 1 \times 10^{-6}$	6	NA	0	NA	0	0.10	< 1
Pit 2 area*	---	---	---	---	---	---	---	---	1.54
Sink Valley									
C2 area	40	1.0×10^{-6}	10	5.3×10^{-3}	30	NA	0	0.10	24
C3 area	38	$< 1 \times 10^{-6}$	10	9.4×10^{-4}	28	NA	0	0.10	1.7
C4 area	47	6.0×10^{-4}	10	9.4×10^{-4}	30	NA	0	0.10	6.0
C6 area	0	NA	0	NA	0	NA	0	0.10	<1
C7 area	11	8.3×10^{-4}	11	NA	0	NA	0	0.10	1.3
C8 area	13	3.8×10^{-7}	13	NA	0	NA	0	0.10	<1
C9 area	31	2.5×10^{-5}	10	1.1×10^{-3}	21	NA	0	0.10	3.4
SS area	70	$< 1 \times 10^{-6}$	15	2.1×10^{-5}	40	$> 1 \times 10^{-1}$	15	0.10	> 220

* Value based on measured 13.4 gpm discharge from 870-foot groundwater intercept trench upgradient (east) of Pit 2 location.

Appendix 7-11

Petersen Hydrologic, LLC hydrologic investigation of mine-water inflows and re-evaluation of sediment pond network

PETERSEN HYDROLOGIC

13 June 2011

Mr. Kirk Nicholes
Alton Coal Development, LLC
Coal Hollow Mine
463 North 100 West, Suite 1
Cedar City, Utah 84720

Kirk,

At your request we have performed two hydrologic investigations at the Alton Coal Development, LLC Coal Hollow Mine. These investigations include

1) An investigation of pit mine-water inflows at the Alton Coal Development, LLC Coal Hollow Mine, and

2) An evaluation of the design criteria of the sediment pond network to determine the ponds' adequacy to treat surface waters, mine waters, and groundwater inflow waters with adequate retention time.

These items are addressed herein in response to specific requests made by the Utah Division of Oil, Gas and Mining.

The purpose of this letter report is to summarize the findings of these two investigations.

Please feel free to contact me should you have any questions in this regard.

Sincerely,

Erik C. Petersen, P.G.
Principal Hydrogeologist
Utah PG #5373615-2250

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INVESTIGATION OF PIT MINE-WATER INFLOWS AT THE COAL HOLLOW MINE

Overview

A previous investigation of groundwater and surface-water systems in the Coal Hollow Mine area was performed by Petersen Hydrologic, LLC (2008) prior to the commencement of mining activities at the Coal Hollow Mine. As a part of that investigation, projections of likely groundwater inflow rates into the future mine pit areas from the overburden were provided.

As the mine pits at the Coal Hollow Mine have been developed, as anticipated, various groundwater inflows to the pits have occurred. The purpose of this investigation is to evaluate the nature and magnitude of these recent inflows. Additionally, the Division of Oil, Gas and Mining has requested that Table 7-9 (pit mine-water inflow estimates) be updated as part of this investigation.

Mine Inflow Projections

The overburden at the Coal Hollow Mine consists of Tropic Shale bedrock (a marine shale unit) overlain by unconsolidated alluvial sediments (Petersen Hydrologic, 2008). Within proposed mining areas, the thickness of the alluvial layer ranges from a few to about 40 feet. The Tropic Shale bedrock lies directly on top of the underlying coal seam. The thickness of the Tropic Shale overburden, intervening between the top of the coal seam and the base of the alluvial deposits, ranges from a few feet to more than 150 feet in the Coal Hollow Mine permit area.

Based on the hydrogeologic characteristics of competent Tropic Shale bedrock, it was previously determined that the water transmitting potential of the unit was very poor. Accordingly, appreciable inflows to mine pit areas from the Tropic Shale bedrock were not anticipated (Petersen Hydrologic, 2008).

The alluvial sediments present in the Coal Hollow Mine area show considerable spatial variability in composition. In most areas, the alluvial sediments encountered in drill holes and exposed in outcrop consist of silty, clayey material with varying amounts of fine-grained sands. Generally, these types of alluvial sediments are of relatively low permeability. In other areas, where the fraction of clay and silt is lower, alluvial materials are more permeable.

As part of the previous investigation, in order to provide estimates of likely future groundwater inflow rates into the mine pit areas, a characterization of the physical properties (including information on the hydraulic conductivity, saturated thickness, and hydraulic gradients in the alluvial groundwater systems) was performed. The alluvial groundwater inflow estimates were then determined using Darcy's Law, which may be expressed as

$$Q = KIA,$$

Where

Q = discharge rate
K = hydraulic conductivity
I = hydraulic gradient
A = cross-sectional area

Values for each parameter utilized in these calculations were obtained as follows:

- Hydraulic conductivity values were determined from the results of slug testing of wells in and around the proposed mining areas. It should be noted that values of hydraulic conductivity determined from slug testing methods are generally considered as order-of-magnitude approximations. The values of hydraulic conductivity obtained from the slug testing results were generally in good

agreement with published values for typical ranges of hydraulic conductivity for the sediment types identified in the area (Freeze and Cherry, 1979).

- Hydraulic gradients in the area were evaluated using monitoring well water level information and surveyed well locations and elevations. As a conservative estimate, a hydraulic gradient of 0.10 was used for all calculations.

- Determinations of cross-sectional area were made using monitoring well water level information and geologic information obtained during drilling activities. Using the saturated unit thickness information, a cross-sectional area for a given length of highwall to be evaluated could be determined.

The results of these groundwater inflow estimates are presented in Table 7-9 of the Coal Hollow Mine Mining and Reclamation Plan (MRP). As noted in the MRP, it is acknowledged that the inflow estimates are approximate, and are intended for general purposes only.

Methods of Study

As part of this investigation, an initial site visit to the Coal Hollow Mine (Pit #1 area) was made during mid-February 2011. An additional visit to the mine site (Pit #2 area) was made in early June 2011. During these site visits, observations of hydrogeologic conditions in the pit highwall and surrounding areas were made. The mine pit and surrounding areas were also photographed during these visits.

During the June 2011 site visit, alluvial groundwater discharge rates in the mine area were measured. Discharge measurements were performed using a calibrated container and a stopwatch. The measurements were performed by damming and diverting the discharge stream to be measured through a length of plastic pipe. Using an appropriately sized container, time-to-fill measurements were performed at least 3 times at each

location. An average time-to-fill value was used to calculate the reported discharge measurement.

The locations of the mine pit groundwater discharge measurement sites and the alluvial drainage trench starting and ending locations were determined in the field using a handheld GPS. These locations were then plotted on a USGS topographic base map as shown in Figure 1. Also shown on Figure 1 are the locations of Coal Hollow Mine monitoring well locations, the mine pit locations, and a projection of the approximate extent of the fluvial channel identified during mining operations.

Climatic Conditions

During the period of the initial stripping of topsoil and the excavation of the initial mine pit areas during late 2010, the mine area experienced extremely wet climatic conditions. Precipitation data collected at the Coal Hollow Weather Station during this period indicate that during the month of December 2010 alone, the mine area received 10.29 inches of precipitation (which represents roughly two-thirds of the average annual precipitation for the year). It is also noteworthy that during the 48-hour period from December 19, 2010 2:00 pm to December 21, 2010 2:00 pm, the mine area experienced both the 10-year, 24-hour storm event (on the 19th) immediately followed by the 100-year, 24-hour storm event (on the 20th). The total precipitation received at the mine site during this 48-hour period was 6.37 inches. Appreciable rain, snow, and snowmelt events continued to occur in the subsequent months resulting in very wet ground conditions at the mine site during early 2011.

Description of Mine Pit Inflow Characteristics

Tropic Shale

As anticipated, no appreciable groundwater inflows to the mine pits from the Tropic Shale bedrock have been observed to date at the Coal Hollow Mine.

Alluvial Groundwater

Inflows of groundwater from shallow alluvial sediments were observed by mine personnel during the initial excavations of the Coal Hollow Mine pit areas during late 2010 and early 2011. It was noted that most of the alluvial groundwater inflow appeared to originate from shallow, near-surface unconsolidated sediments west of the Pit #1 area (personal communication, Larry Johnson). It appeared to the mine personnel that the shallow groundwater encountered in the pit areas was water that had recharged during periods of copious precipitation on the surrounding areas that had recently been stripped of the typically clayey soil cover, thus exposing the underlying unconsolidated sediments.

When, as part of this investigation, the mine pit site was visited in June 2011, alluvial groundwater inflows from areas to the west had become minimal. It was observed that, as anticipated, only minimal amounts of groundwater was seeping from the silty, clayey alluvium exposed in most of the pit highwall areas (See photograph section). However, during mining operations in the Pit 1 and Pit 2 areas, a buried fluvial channel system in the alluvial deposits was encountered (see Figure 1 for an approximate projection of the local extents of the buried fluvial channel; also see the Photograph Section at the end of this report). The fluvial channel deposits consist of silty, sandy, and gravelly sediments with appreciably higher permeability than the silty, clayey alluvial sediments encountered in the vicinity of the C0, C6, and C8 monitoring wells (See Figure 1 and Photograph Section). Due to the higher hydraulic conductivity of the sediments associated with the fluvial channel, higher rates of groundwater inflow to the mine pit areas occurred relative to the clayey, silty alluvium present in the surrounding alluvial sediments.

Pit Mine-Water Inflow Measurements

On 2 June 2011, an inventory of the pit mine-water inflows in the Coal Hollow Mine active mining area (Pit 2) was performed. At the time of the inventory, the excavation of Pit #2 was only partially completed and the length of the exposed highwall was estimated to be about 600 feet. The results of this inventory are summarized in below.

Tropic Shale

No measurable discharge was observed from the Tropic Shale bedrock exposed in the mine pit areas.

Clayey, silty alluvium

Only minor seepage and zones of wetness were observed in the silty, clayey alluvium exposed in the mine pit areas. No measurable discharge was observed during the 2 June 2011 site visit and flow inventory. The total flow from this unit is estimated to be less than 1 gpm.

Fluvial channel alluvium

At the time of the 2 June 2011 inventory, most alluvial groundwater from the buried fluvial channel system intercepted by the Pit 2 mine workings was being routed through two drainage channels to a common sump location (see Photograph Section). The discharges measured from these two channels were 2.6 gpm and 2.9 gpm for the northern and southern channels, respectively, for a combined discharge of 5.5 gpm. Some additional diffuse seepage along the exposed base of the fluvial channel north of the current extent of the Pit #2 highwall was also occurring (expressed at the surface primarily as a damp/wet excavated face).

Up-gradient alluvial water

In an attempt to dewater the alluvial sediments up-gradient of the Pit 2 area, a north-south trending alluvial drainage intercept channel was constructed. The channel was excavated to a depth of approximately 15 feet below the local pre-mining land surface and was

approximately 870 feet in length. The discharge flowing through this intercept trench was measured at 13.4 gpm.

Smirl Coal Seam

At the time of the 2 June 2011 pit mine-water inflow inventory, only minimal quantities of water were believed to be seeping from the coal seam into the pit floor. Measurable, discrete discharges from the coal seam into the pit area were not observed. However, a small impoundment of water was present at the bottom of the pit area (see Photograph Section). This small impoundment likely contained alluvial groundwater from seepage out of the adjacent fluvial channel system in addition to water weeping from the coal seam. The total discharge from the coal seam was estimated to be less than 1 or 2 gpm at the time of the inventory. It should be noted that mine personnel indicate that typically when the coal seam is first excavated, somewhat higher flows have occurred from the coal seam (personal communication, Larry Johnson).

Miscellaneous Inflows

An isolated discharge of approximately 2 gpm was observed diffusely seeping onto the mine floor at the southwestern corner of Pit #2. This flow seeped from the pit floor from the adjadent, now backfilled Pit #1 area located immediately west of Pit #2. It should be noted that the mine floor of the currently mined Pit #2 is an extension of the Pit #1 floor and is topographically below and down-dip stratigraphically of the adjacent previously mined Pit #1 mine floor.

Revisions to Estimates of Groundwater Inflow Rates (Table 7-9)

Previously provided estimates of groundwater inflow rates into the Coal Hollow Mine workings (See Appendix 7-1 and Table 7-9 in the Coal Hollow Mine MRP) were based on the hydrogeologic conditions encountered in nearby monitoring wells. However, no monitoring well was completed in the alluvial fluvial channel deposits that have been intercepted by the Pit #1 and Pit #2 mine workings subsequent to the initial investigation.

Accordingly, the groundwater inflow rate estimates provided in Table 7-9 have been updated to reflect the conditions in the fluvial channel system.

Based on the length of the alluvial drainage channel (870 feet) and the measured discharge of 13.4 gpm, a value of 1.5 gpm per 100 lineal feet of the exposed channel is calculated. It should be noted that it is unclear whether the entire thickness of the alluvial system is exposed in the walls of the excavated alluvial drainage channel. Additionally, it should be noted that alluvial sediments present in the intercept trench include materials other than the fluvial channel sediments. Accordingly, the 1.5 gpm per 100 linear feet inflow estimate should be considered as a composite discharge from all alluvial types present.

It should also be noted that the values listed in Table 7-9 are reported as alluvial groundwater inflow rates per 100 lineal feet of mine opening, oriented perpendicular to the groundwater flow direction. In other words, the values reported represent the volumes of water flowing from the upgradient area into the mine void. The discharges measured in the alluvial drainage channels likely include both upgradient groundwater flow intercepted by the trench as well as water being removed from storage (draining) from the saturated down-gradient side of the trench. Accordingly, the 13.4 gpm likely overestimates the quantity of flow that would actually flow into the mine pit over a corresponding length and thickness of highwall (i.e. at the highwall face, there could obviously be no release of water from storage in down-gradient locations).

The two alluvial trenches constructed in the interior of the fluvial channel system (see Figure 1) are likely primarily removing water in storage in the channel system and discharge at modest flow rates.

The inflow estimate previously reported for the clayey alluvium unit in Table 7-9 of the Coal Hollow Mine MRP (which is present in most locations in the Pit #1 and Pit #2 highwalls) is considered acceptable. The reported value for this unit (<1 gpm per 100 lineal feet of highwall) is in good agreement with the observed lack of appreciable

drainage from that unit where it was exposed and observed in the mine Pit #1 and Pit #2 highwalls.

It should be noted that the alluvial groundwater inflow into Pit #2 measured on 2 June 2011 (which was during the high-flow period following a very wet winter) was only 5.5 gpm, (with some additional diffuse seepage where the channel was excavated and exposed at the surface north of the 600-foot length of exposed highwall). Given the approximately 600-foot length of highwall exposed, this equates to a discharge on the order of <1 gpm per 100 linear feet of pit face exposed, which is not inconsistent with the previously estimated pit inflows in this area (See Table 7-9 in the Coal Hollow Mine MRP). As indicated in the Coal Hollow Mine MRP (Section 728.333) it was anticipated that the rates of pit mine-water inflows would be variable and would likely range from a few tens of gallons per minute in dryer areas and where the mine open pit areas are small, to several hundreds of gallons per minute in wetter areas and where the mine open pit areas are large (see MRP section 728.333). It was also anticipated that if the mine workings were to rapidly expose large areas of water-bearing, coarse-grained sediments, appreciably greater inflows could potentially occur.

SEDIMENT POND DESIGN CRITERIA EVALUATION

Overview

As described in the Coal Hollow Mine MRP, five sediment ponds have been constructed within the mine permit area. The Division of Oil, Gas and Mining has requested that Alton Coal Development, LLC (ACD) reevaluate the "design criteria of all sediment ponds to account for excess groundwater that is being encountered at the site". The findings of our investigation in this regard are presented in the following sections of this report.

Sediment Pond Design

The Utah Coal Mining Rules require that such sediment ponds be designed to contain the 10-year, 24-hour precipitation event. However, as a conservative measure, the Coal Hollow Mine sediment ponds were designed to contain the 100-year, 24-hour precipitation event. An additional capacity of at least 15% was included in the pond design specifications to allow for temporarily diminished capacity resulting from standing water or sediment accumulation or in the pond between pond cleanouts. As indicated in Section 742.221.33 of the Coal Hollow Mine MRP, these conservative design estimates have resulted in sediment pond storage capacities that are at least 155% of the required "design event" (See Section 742.221.33 in the Coal Hollow Mine MRP). Spillways were also included in the structure designs to provide a non-destructive route for discharge should these capacities ever be exceeded. The ponds were designed to keep discharges from the structure at a minimum and allow adequate settlement time to meet Utah and Federal effluent limitations (see Coal Hollow Mine MRP, Section 742.221.31)

As described above, the sediment ponds were designed to provide detention of the runoff from the "design event" with a substantial additional reserve capacity (sized to 155% of the 10-year, 24-hour requirement). However, although a UPDES permit that allows for the discharge of mine groundwater from Pond 3 and Pond 4 (See Drawing 5-3 in the Coal

Hollow Mine MRP for pond locations) was obtained, the pond designs apparently did not explicitly contemplate the storage of groundwater.

As part of this investigation, the procedures used by ACD personnel to determine appropriate storage volumes for sediment ponds were reviewed and evaluated. A discussion of the procedures used by ACD personnel to perform the sediment pond analysis is provided in the Coal Hollow Mine MRP, Appendix 5-2. The watershed analyses from which the appropriate sediment pond capacities were evaluated mainly using the TR-55 method. This method is widely used for evaluating small watersheds. To assist with the calculations and mapping, Carlson 2007 Hydrology software was used in the evaluation. The watershed analysis included determinations of runoff flow paths, watershed boundaries, length and average grade for the longest flow lines, runoff curve number classification, time of concentration and peak discharge. Information from that analysis was then utilized for sediment structure sizing.

Having reviewed the methodologies and assumptions used in the sediment pond design analysis, it appears that the methodologies utilized and the calculation results are reasonable and the resulting ponds design capacities are more than adequate to contain the 10-year, 24-hour precipitation event as required by the Utah Coal Mining Rules.

Handling of Excess Groundwater

As described above, the sediment ponds were designed to contain the runoff from the 100-year, 24-hour precipitation event with a substantial additional reserve capacity (which equates to a storage capacity of approximately 155% of the 10-year, 24-hour precipitation event requirement). However, although a UPDES permit that allows for the discharge of mine groundwater from Pond 3 and Pond 4 was obtained (See Drawing 5-3 in the Coal Hollow Mine MRP for pond locations), the pond designs apparently did not explicitly contemplate the storage or discharge of groundwater from the mine. The reason for this design assumption was because the Coal Hollow Mine MRP envisioned the diversion of alluvial groundwater that would likely be encountered in the mine highwalls away from the mine workings without allowing it to flow into the mine pit

areas. Smaller quantities of groundwater (nuisance water) that might potentially be encountered elsewhere in the mine pits would primarily be managed within the pit areas without the need to discharge large quantities of water from the mine workings (although a UPDES permit to discharge such water from Pond 3 or Pond 4 if necessary was obtained). Accordingly, discharge of appreciable quantities of mine waters was not anticipated. As indicated in the Coal Hollow Mine MRP (Section 728.332):

> *Where possible, groundwater that will be encountered in alluvial sediments along the margins of mine pit areas will be routed through pipes, ditches or other conveyance methods away from mining areas via gravity drainage so as to prevent or minimize the potential for interaction with sediments disturbed by mining operations (including contact with the mined coal seam).*
>
> *The pumping and discharging of mine water from mine pits at the proposed Coal Hollow Mine permit area is not anticipated. The impoundment of substantial quantities of water within the mine pits would likely result in degradation of groundwater quality and is also not compatible with the proposed surface mining technique (the coal extraction operations occur at the bottom of the mine pit and thus they cannot be performed in flooded mine pits). As discussed above, the only likely foreseeable source of appreciable quantities of groundwater is from the alluvial groundwater systems overlying the low-permeability Tropic Shale in proposed mining areas. Where this alluvial groundwater is encountered in mining areas, it will be diverted away from mine workings prior to significant interaction with sediments in disturbed areas. Any discharge from the mine pits that does occur will be regulated under a Utah UPDES discharge permit.*

As indicated in the Coal Hollow Mine MRP (Section 728.333):

> *In the unanticipated event that excessive quantities of water were to flow into the mine pits by any mechanism, the water would be pumped from the pits using a suitable pump and piping equipment that will be located on-site at the Coal*

Hollow Mine for such a contingency. Such water would be managed appropriately as required by all applicable State and Federal regulations.

As noted previously in this report, very large amounts of precipitation were received at the Coal Hollow Mine area during the winter of 2010-2011. The amount of precipitation received on 19 December 2010 equaled the 10-year, 24-hour storm event. Incredibly, the amount of precipitation received on the following day (20 December 2010) exceeded the 100-year, 24-hour storm event. In response to this and subsequent precipitation and snowmelt runoff events, appreciable quantities of water were routed to the sediment ponds. During the winter of 2010-2011, modest amounts of mine groundwater were also routed to Pond 3 and some discharge from the pond subsequently occurred. This discharge occurred under the approved UPDES discharge permit. It is considered likely that under a more normal seasonal precipitation regime, gravity discharge from Pond 3 would likely not have occurred (some water is routinely pumped and will likely continue to be pumped from the mine sediment ponds for use in dust suppression activities).

In preparation for the dewatering of up-gradient alluvial groundwaters that may be encountered near mine pit areas via gravity flow through pipes, ditches, or other conveyance mechanisms (as described in the Coal Hollow Mine MRP), discussions in that regard have been had with personnel from the Utah Division of Water Quality and the Utah Division of Oil, Gas and Mining. During these discussions, the plans for the diverting of shallow groundwaters away from mine workings and the routing of those uncontaminated alluvial groundwaters to discharge points under a UPDES permit as described in the Coal Hollow Mine MRP were discussed. Pending final written authorization from the Utah Division of Water Quality, these plans will be implemented. Accordingly, these uncontaminated alluvial groundwaters will not be routed to the sediment ponds. Therefore, under this water management plan (as previously described in the Coal Hollow Mine MRP) there should be no need to redesign and reconstruct the existing sediment ponds to account for any storage of appreciable quantities of excess groundwater in the ponds.

As described above, the sediment ponds have been designed to contain at least 155% of the required maximum runoff event. Accordingly, there would currently be a designed storage capacity in the ponds that considerably exceeds the minimum design requirement. Consequently, under more normal climatic conditions, appreciable quantities of groundwater could likely be routed to the existing sediment ponds while maintaining the minimum storage capacity required by the Utah Coal Mining Rules.

Accordingly, it is my professional opinion that the existing pond network meets or exceeds the minimum requirements of the Utah Coal Mining Rules. Therefore, construction of new sediment ponds or the addition of additional capacity to the existing ponds at the Coal Hollow Mine is not necessary at this time.

References Cited

Freeze, R.A., and Cherry, J.C., 1979, Groundwater, Prentice-Hall, Inc. Englewood Cliffs, New Jersey, 604 p.

Petersen Hydrologic, 2008, Investigation of groundwater and surface-water systems in the 630-acre proposed Coal Hollow Mine permit and adjacent area; probable hydrologic Consequences of coal mining; recommended monitoring plan; potential alluvial valley floor information; Kane County, Utah, Consulting report for Alton Coal Development, LLC, included as Appendix 7-1 in Coal Hollow Mine MRP.

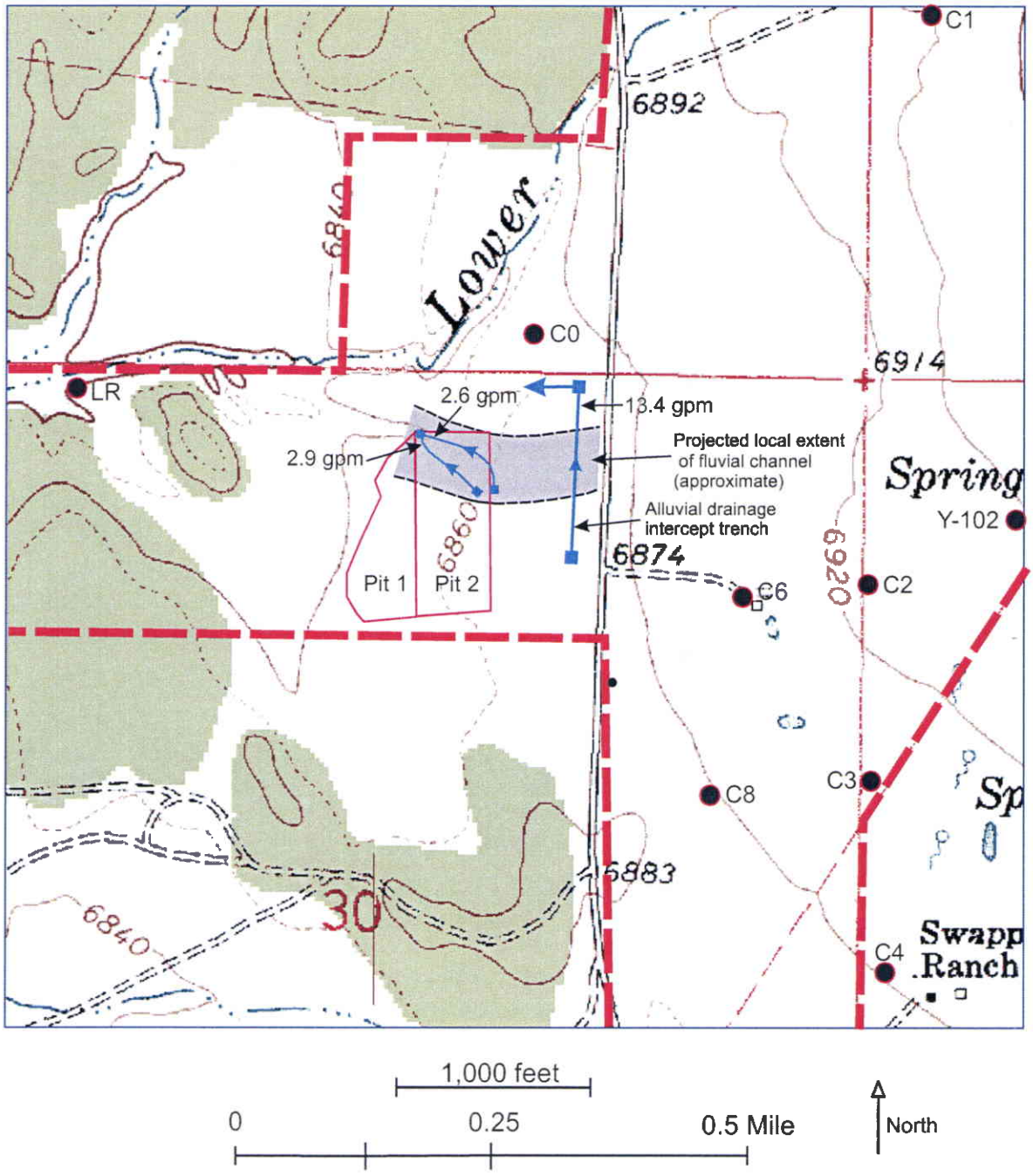


Figure 1 Locations of mine pit inflow measurements at the Coal Hollow Mine.

Photograph Section

Pit #1 highwall, February 2011, note lack of discharge from overburden exposed in highwall and water pooling on pit floor (likely sourced from fluvial channel drainage and minor weeping from coal seam).

Pit #1 south and east highwalls, February 2011, note lack of discharge from overburden.

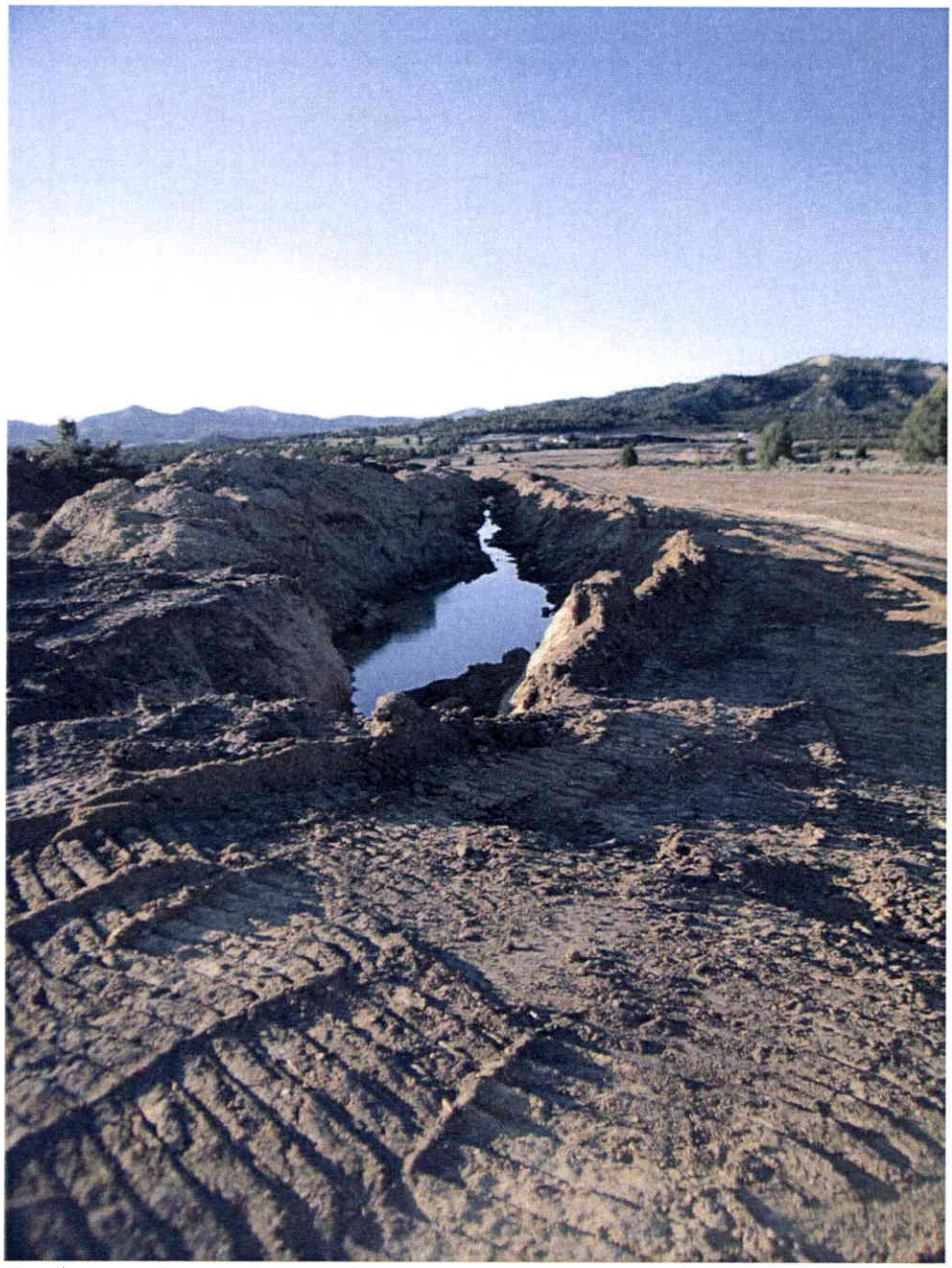
Pit #1 Highwall, February 2011, note seepage from southern margin of fluvial channel in center of photo.

Pit #1 floor area, February 2011, note pool of water which is likely derived largely from alluvial seepage from fluvial channel (discharge from fluvial channel is apparent at far left in photo.

Pit #2 highwall, June 2011, note lack of discharge from overburden.

Area north of Pit #2 highwall, June 2011, note two alluvial drainage trenches at right of photo and diffuse seepage from saturated alluvial sediments at center of photo.

Area north of Pit #2 extent, June 2011, note fluvial channel deposits in trench walls.



South (upper) end of alluvial drainage intercept trench, June 2011.

Southwest corner of Pit #2, June 2011, note minor seepage from mine floor of Pit #1.

Northern extent of Pit #2 highwall, June 2011, showing southernmost extent of fluvial channel in Pit #2 with associated dampness of alluvial sediments.

Appendix 7-12

UPEDS Permit No. UTG040027

State of Utah
JON M. HUNTSMAN, JR.
Governor

GARY HERBERT
Lieutenant Governor

Department of
Environmental Quality

William J. Sinclair
Acting Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

April 23, 2009

CERTIFIED MAIL
(Return Receipt requested)

Chris McCourt, Manager
Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, UT 84720

Dear Mr. McCourt:

Subject: UPDES Coal Mine General Permit Coverage No. UTG040027 for the Alton Coal Development – Coal Hollow Mine Site near Alton, Utah.

Enclosed is a signed copy of the Utah Pollutant Discharge Elimination System (UPDES) General Permit No. UTG040000 for the above referenced facility. Coverage under this general permit for your facility is referred to as application number UTG040027. The conditions and requirements of the permit are effective as of May 1, 2009. Copies of EPA form 3320-1, Discharge Monitoring Reports (DMR) forms, for reporting and self-monitoring requirements as specified in the permit, are available upon request. As a reminder, DMR forms are due in our office by the 28th of each month following each monthly monitoring period.

A fee schedule was included in the Utah Department of Environmental Quality Budget appropriation request at the direction of the Legislature and in accordance with Utah Code annotated 19-1-201. The fee schedule, as approved by the legislature, includes a prescribed fee for specific Industrial Categories. The prescribed fee for this general permit, UPDES General Permit for Coal Mine Facilities, is $1,800.00 for a five-year period from May 1, 2008 to April 30, 2013. A prorated amount of $1,440.00 has been appropriated for your permit coverage from May 1, 2009 to April 30, 2013 and a separate invoice had been included herein. Therefore, please remit $1,440.00 within 30 days from receipt of this letter to:

Department of Environmental Quality
Division of Water Quality
Attn: Nicole Carrell
P.O. Box 144870
Salt Lake City, UT 84114-4870

Please be sure to include the invoice number with you remittance.

Also, as the State agency charged with the administration of issuing UPDES permits, we are continuously looking for ways to improve our quality of service to you. In an effort to improve the State UPDES permitting process, we are asking for your input. Since our customer permittee base is limited, your input is important to us. Please take a few moments to complete the enclosed questionnaire and return it in the postage paid, self-addressed return envelope. The results will be used to improve our quality and responsiveness to our permittees and give us feed back on customer satisfaction. We will address any issues you identify on an ongoing basis.

If you have any questions with regards to this matter, please contact Jeff Studenka of this office at (801) 538-6779 or by e-mail at jstudenka@utah.gov.

Sincerely,

Mike Herkimer

Mike Herkimer, Manager
UPDES IES Section

MH/JS/mc

Enclosures

cc: Qian Zhang, P.E., EPA Region VIII (w/ Encl.)
David Blodgett, SW Utah Public Health (w/ Encl.)
John Chartier, SW District Engineer (w/ Encl.)
Daron Haddock, Utah Division of Oil Gas & Mining (w/ Encl.)
Jim Karpowitz, Utah Division of Wildlife Resources
Nathan Darnall, U.S. Fish & Wildlife Services

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Permit No. UTG040027
Minor Industrial

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

AUTHORIZATION TO DISCHARGE UNDER THE

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM
(UPDES)

GENERAL PERMIT FOR COAL MINING

In compliance with provisions of the Utah *Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended* (the *"Act"*),

Alton Coal Development, LLC – Coal Hollow Project

as identified in the application No. UTG040027 is authorized to discharge from the Coal Hollow Project outfalls to receiving waters named:

Lower Robinson Creek and Sink Valley Wash, tributaries to Kanab Creek and the Colorado River

in accordance with discharge points, effluent limitations, monitoring requirements and other conditions as set forth herein.

This permit shall become effective on May 1, 2009.

This permit and the authorization to discharge shall expire at midnight, April 30, 2013.

Signed this 23rd day of April, 2009

Leah Ann Lamb
Acting Executive Secretary
Utah Water Quality Board

TABLE OF CONTENTS

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Criteria for Inclusion in the General Permit for Coal Mining

This General permit shall apply only to the discharge of treated wastewater from:

Coal mining operations either new or existing in Utah which include or will include in part, or in whole, alkaline mine water drainage, storm water runoff from coal preparation plant associated areas, active mining areas, and post mining areas until the performance bond is released. The total dissolved solids (TDS) are limited to a concentration of 500 mg/L at all discharge points, or one ton per day as a sum from all discharges.

B. Notice of Intent for a General Permit for Coal Mining

Any facility which desires coverage under this general permit for coal mining and meets the requirements of Part I.A. may be issued general permit coverage by submitting a notice of intent (NOI) to the Division of Water Quality.

The NOI shall include:

1. A completed Environmental Protection Agency Application (EPA Form 3510-1) or equivalent information.

2. Location and identification number (such as 001, 002, etc.) of each existing discharge and/or proposed discharge point(s). This includes the latitude and longitude to the nearest 15 seconds and the name of the receiving water(s).

3. A description of the source of the wastewater for each discharge point.

4. A description of the treatment given or proposed for the wastewater at each discharge point and if necessary a justification of why no treatment is required.

5. Flow characteristics for each discharge point such as whether flow is or will be continuous or intermittent and indicate projected and/or actual average and maximum flows in gallons per day (gpd), or million gallons per day (MGD).

6. Data for each discharge point for the following parameters:

    a. Biochemical demand (BOD_5).
    b. Chemical oxygen demand (COD).
    c. Total organic carbon (TOC).
    d. Total suspended solids (TSS).
    e. Flow.
    f. Ammonia (as N).
    g. Oil and grease.
    h. Temperature.
    i. pH.
    j. Total dissolved solids (TDS).
    k. Total iron and metals, cyanide, phenols located in *Table III of UAC R317-8-3.12.*
    l. For discharge(s) of mine water or mine water and mine water mixed with surface runoff one acute whole efficiency toxicity test (WET) using two species and full dilution series

(five dilutions plus a control). Sediment pond discharges which have only surface runoff do not require WET tests.

m. Date and time of sampling for each parameter.

n. Date and time of analysis for each parameter.

o. Utah certified laboratory which has completed the analysis for each parameter.

For each discharge point the presence or absence of any toxic and/or priority pollutants as listed in *Table II, UAC R317-8-3.13.*

C. Description of Discharge Point(s).

The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit is a violation of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

Outfall Number	Location of Discharge Point(s)
001	Storm water runoff from sediment pond #1 to Lower Robinson Creek, Latitude 37° 24' 13" N, Longitude 112°27'13"W.
001B	Storm water runoff from sediment pond #1B to Lower Robinson Creek, Latitude 37° 24' 11" N, Longitude 112°27'16"W.
002	Storm water runoff from sediment pond #2 to Lower Robinson Creek, Latitude 37° 24' 10" N, Longitude 112°27'16"W.
003	Ground water and storm water runoff from sediment pond #3 to Lower Robinson Creek, Latitude 37° 23' 51" N, Longitude 112°27'53"W.
004	Ground water and storm water runoff from sediment pond #4 to Sink Valley Wash, Latitude 37° 23' 01" N, Longitude 112°27'03"W.

D. Narrative Standard.

It shall be unlawful, and a violation of this permit, for the permittee 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.

E. Specific Limitations and Self-monitoring Requirements.

1. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfalls 001, 001B, 002, 003, and 004. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristics	Discharge Limitations a/ Average 30-Day	7-Day	Daily Maximum	Monitoring Requirements Measurement Frequency	Sample Type
Flow, gpd or MGD	N/A	N/A	NA	Monthly	Measured b/
Oil & Grease, mg/L	N/A	N/A	10 c/	Monthly	Visual/Grab
Total Iron, mg/L	N/A	N/A	1.0	Monthly	Grab e/
Total Suspended Solids, mg/L	25	35	70	Monthly	Grab e/
Total Dissolved Solids, mg/L	500 d/	N/A	NA	Monthly	Grab e/

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units in any sample and shall be monitored monthly by a grab sample.

There shall be no visible sheen or floating solids or visible foam in other than trace amounts.

There shall be no discharge of sanitary wastes or process water from coal preparation plants.

N.A. - Not Applicable.

a/ See Definitions, *Part V.A* for definition of terms.

b/ For intermittent discharge, the duration of the discharge shall also be reported.

c/ If a visual sheen for oil and/or grease is observed, or there is another reason to believe oil and/or grease may be present in the discharge, then a grab sample must be taken immediately and the results shall not exceed 10 mg/L.

d/ If each outfall cannot achieve a 30-day average of 500 mg/L, then the permittee is limited to one ton (2000 lbs) per day as a sum from all outfalls.

e/ These samples may also be a composite sample.

2. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): in the final effluent before mixing with any receiving waters.

3. Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) at outfall(s) (from approved decant procedures only) may comply with the following limitations instead of the otherwise applicable limitations for TSS in Part I.E.1:

Effluent Characteristics	Daily Maximum
Settleable Solids	0.5 ml/L

In addition to the monitoring requirements specified under Part I.E.1 all effluent samples collected during storm water discharge events shall also be analyzed for settleable solids. Such analyses shall be conducted monthly by grab samples.

4. Any discharge or increase in the volume of a discharge caused by precipitation within any 24 hour period greater than the 10-year, 24 hour precipitation event (or snowmelt of equivalent volume) at outfall(s) from sedimentation ponds may comply with the following limitations instead of the otherwise applicable limitations:

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units. However as stated in Part I.E.3, all effluent samples collected during storm-water discharge events shall be analyzed for settleable solids and parameters identified under Part I.E.1.

5. The operator shall have the burden of proof that the discharge or increase in discharge was caused by the applicable precipitation event described in Parts I.E.3 and 4. The alternate limitations in Parts I.E.3 and 4 shall not apply to treatment systems that treat underground mine water only.

6. Additional monitoring shall be required for facilities that discharge into waters or watersheds on the Utah 303(d) list of impaired waters. These facilities shall be required to monitor for the pollutant(s) that cause the impairment for these waters. The Division of Water Quality will incorporate any additional sampling requirements for parameters of concern.

F. Storm Water Requirements. It has been determined that the aforementioned permittee has a regulated storm water discharge as per UAC R317-8-3.9., therefore, the following permit conditions governing storm water discharges apply.

1. Coverage of This Section.

a. Discharges Covered Under This Section. The requirements listed under this section shall apply to storm water discharges from this permitted facility, subject to effluent limitations listed in Part I.E. of this permit.

1) Site Coverage. Storm water discharges from the following portions of this permitted facility may be eligible for this permit: haul roads (nonpublic roads on which coal or coal refuse is conveyed), access roads (nonpublic roads providing light vehicular traffic within the facility property and to public roadways), railroad spurs, sidings, and internal haulage lines (rail lines used for hauling coal within the facility property and to offsite commercial railroad lines or loading areas), conveyor belts, chutes, and aerial tramway haulage areas (areas under and around coal or refuse conveyor areas, including transfer stations), equipment storage and maintenance yards, coal handling buildings and structures, and inactive coal mines and related areas (abandoned and other inactive mines, refuse disposal sites and other mining-related areas on private lands).

2. Prohibition of Non-storm Water Discharges.

a. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharge is in compliance with this section; fire fighting activities; fire hydrant flushings; potable water sources including waterline flushings; drinking fountain water; irrigation drainage, lawn watering; routine external building washdown water where detergents or other compounds have not been used in the process; pavement washwaters where spills or leaks of toxic or hazardous materials (including oils and fuels) have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated compressor condensate; uncontaminated springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

3. Storm Water Pollution Prevention Plan Requirements. Most of the active coal mining-related areas, described in paragraph 1. above, are subject to sediment and erosion control regulations of the U.S. Office of Surface Mining (OSM) that enforces the Surface Mining Control and Reclamation Act (SMCRA). OSM has granted authority to the Utah Division of Oil Gas and Mining (DOGM) to implement SMCRA through State SMCRA regulations. All SMCRA requirements regarding control of erosion, siltation and other pollutants resulting from storm water runoff, including road dust resulting from erosion, shall be primary requirements of the pollution prevention plan and shall be included in the contents of the plan directly, or by reference. Where determined to be appropriate for protection of water quality, additional sedimentation and erosion controls may be warranted.

a. Contents of Plan. The plan shall include at a minimum, the following items:

1) Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team that are responsible for developing the storm water pollution prevention plan and assisting the facility manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

2) Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources that may reasonably be expected to add significant amounts of pollutants to storm water discharges or that may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials that may potentially be significant pollutant sources. Each plan shall include, at a minimum:

a) Deadlines for Plan Preparation and Compliance
The permittee shall prepare, implement and/or update a plan in compliance with the provisions of this section within 270 days of the effective date of this permit.

b) Keeping Plans Current

The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified by the plan, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with the activities at the mine.

c) Drainage.

(1) A site map, such as a drainage map required for SMCRA permit applications, that indicate drainage areas and storm water outfalls. These shall include but not be limited to the following:

(a) Drainage direction and discharge points from all applicable mining-related areas described in paragraph 1.a(1). (Site Coverage) above, including culvert and sump discharges from roads and rail beds and also from equipment and maintenance areas subject to storm runoff of fuel, lubricants and other potentially harmful liquids.

(b) Location of each existing erosion and sedimentation control structure or other control measures for reducing pollutants in storm water runoff.

(c) Receiving streams or other surface water bodies.

(d) Locations exposed to precipitation that contain acidic spoil, refuse or unreclaimed disturbed areas.

(e) Locations where major spills or leaks of toxic or hazardous pollutants have occurred.

(f) Locations where liquid storage tanks containing potential pollutants, such as caustics, hydraulic fluids and lubricants, are exposed to precipitation.

(g) Locations where fueling stations, vehicle and equipment maintenance areas are exposed to precipitation.

(h) Locations of outfalls and the types of discharges contained in the drainage areas of the outfalls.

(2) For each area of the facility that generates storm water discharges associated with the mining-related activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow, and an identification of the types of pollutants that are likely to be present in storm water discharges associated with the activity. Factors to consider include the toxicity of the pollutant; quantity of chemicals used, produced or discharged; the likelihood of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified.

d) Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

e) Spills and Leaks. A list of significant spills and leaks of toxic or

hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility beginning 3 years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

f) Sampling Data. A summary of any existing discharge sampling data describing pollutants in storm water discharges from the portions of the facility covered by this permit, including a summary of any sampling data collected during the term of this permit.

g) Risk Identification and Summary of Potential Pollutant Sources. A narrative description of the potential pollutant sources from the following activities: truck traffic on haul roads and resulting generation of sediment subject to runoff and dust generation; fuel or other liquid storage; pressure lines containing slurry, hydraulic fluid or other potential harmful liquids; and loading or temporary storage of acidic refuse or spoil. Specific potential pollutants shall be identified where known.

3) Measures and Controls. The permittee shall develop a description of storm water management controls appropriate for the facility and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the permitted facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls.

a) Good Housekeeping. Good housekeeping requires the maintenance of areas that may contribute pollutants to storm water discharges in a clean, orderly manner. These are practices that would minimize the generation of pollutants at the source or before it would be necessary to employ sediment ponds or other control measures at the discharge outlets. Where applicable, such measures or other equivalent measures would include the following: sweepers and covered storage to minimize dust generation and storm runoff; conservation of vegetation where possible to minimize erosion; watering of haul roads to minimize dust generation; collection, removal, and proper disposal of waste oils and other fluids resulting from vehicle and equipment maintenance; or other equivalent measures.

b) Preventive Maintenance. A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems. Where applicable, such measures would include the following: removal and proper disposal of settled solids in catch basins to allow sufficient retention capacity; periodic replacement of siltation control measures subject to deterioration such as straw bales; inspections of storage tanks and pressure lines for fuels, lubricants, hydraulic fluid or slurry to prevent leaks due to deterioration or faulty connections; or other equivalent measures.

c) Spill Prevention and Response Procedures. Areas where potential spills that can contribute pollutants to storm water discharges can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up shall be available to personnel.

d) Inspections. In addition to or as part of the comprehensive site evaluation required under paragraph 3.a.(4) of this section, qualified facility personnel shall be identified to inspect designated areas of the facility at appropriate intervals specified in the plan. The following shall be included in the plan:

(1) Active Mining-Related Areas and Those Inactive Areas Under SMCRA Bond Authority. The plan shall require quarterly inspections by the facility personnel for areas of the facility covered by pollution prevention plan requirements. This inspection interval corresponds with the quarterly inspections for the entire facility required to be provided by SMCRA authority inspectors for all mining-related areas under SMCRA authority, including sediment and erosion control measures. Inspections by the facility representative may be done at the same time as the mandatory inspections performed by SMCRA inspectors. Records of inspections of the SMCRA authority facility representative shall be maintained.

(2) Inactive Mining-Related Areas Not Under SMCRA Bond. The plan shall require annual inspections by the facility representative except in situations referred to in paragraph 3.a.(4)(d) below.

(3) Inspection Records. The plan shall require that inspection records of the facility representative and those of the SMCRA authority inspector shall be maintained. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections.

e) Employee Training. Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify periodic dates for such training.

f) Record keeping and Internal Reporting Procedures. A description of incidents (such as spills, or other discharges) along with other

information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

g) Non-storm Water Discharges.

(1) Certification. The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges such as drainage from underground portions of inactive mines or floor drains from maintenance or coal handling buildings. The certification shall include the identification of potential significant sources of non-storm water discharges at the site, a description of the results of any test and/or evaluation, a description of the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with Part IV.G.4. of this permit.

(2) Exceptions. Except for flows from fire fighting activities, authorized sources of non-storm water listed in Part I.F.2.a. that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

(3) Failure to Certify. If the permittee is unable to provide the certification required (testing or other evaluation for non-storm water discharges), the Executive Secretary must be notified within 180 days after the effective date of this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water to the storm discharge lines; and why adequate tests for such storm discharge lines were not feasible. Non-storm water discharges to waters of the State that are not authorized by a UPDES permit are unlawful, and must be terminated.

h) Sediment and Erosion Control. The plan shall identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion and reduce sediment concentrations in storm water discharges. As indicated in paragraph I.F.3. above, SMCRA requirements regarding sediment and erosion control measures are primary requirements of the pollution prevention plan for mining-related areas subject to SMCRA authority. The following sediment and erosion control measures or other equivalent measures, should be included in the plan where reasonable and

appropriate for all areas subject to storm water runoff:

(1) Stabilization Measures. Interim and permanent stabilization measures to minimize erosion and lessen amount of structural sediment control measures needed, including: mature vegetation preservation; temporary seeding; permanent seeding and planting; temporary mulching, matting, and netting; sod stabilization; vegetative buffer strips; temporary chemical mulch, soil binders, and soil palliatives; nonacidic road surfacing material; and protective trees.

(2) Structural Measures. Structural measures to lessen erosion and reduce sediment discharges, including: silt fences; earth dikes; straw dikes; gradient terraces; drainage swales; sediment traps; pipe slope drains; porous rock check dams; sedimentation ponds; riprap channel protection; capping of contaminated sources; and physical/chemical treatment of storm water.

i) Management of Flow. The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (other than those as sediment and erosion control measures listed above) used to manage storm water runoff in a manner that reduces pollutants in storm water runoff from the site. The plan shall provide that the measures, which the permittee determines to be reasonable and appropriate, shall be implemented and maintained. Appropriate measures may include: discharge diversions; drainage/storm water conveyances; runoff dispersion; sediment control and collection; vegetation/soil stabilization; capping of contaminated sources; treatment; or other equivalent measures.

4) Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at intervals specified in the plan, but in no case less than once a year. Such evaluations shall provide:

a) Areas contributing to a storm water discharge associated with coal mining-related areas shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. These areas include haul and access roads; railroad spurs, sidings, and internal haulage lines; conveyor belts, chutes and aerial tramways; equipment storage and maintenance yards; coal handling buildings and structures; and inactive mines and related areas. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures, as indicated in paragraphs 3.a.(3)(h) and 3.a.(3)(i) above and where identified in the plan, shall be observed to ensure that they are operating correctly. A visual evaluation of any equipment needed to implement the plan, such as spill response equipment, shall be made.

b) Based on the results of the evaluation, the description of potential

pollutant sources identified in the plan, in accordance with paragraph 3.a.(2) of this section, and pollution prevention measures and controls identified in the plan, in accordance with paragraph 3.a.(3) of this section, shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner. For inactive mines, such revisions may be extended to a maximum of 12 weeks after the evaluation.

c) A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph 3.a.(4)(b) above shall be made and retained as part of the storm water pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part IV.G.4. (Signatory Requirements) of this permit.

d) Where compliance evaluation schedules overlap with inspections required under 3.a.(3)(d), the compliance evaluation may be conducted in place of one such inspection. Where annual site compliance evaluations are shown in the plan to be impractical for inactive mining sites due to the remote location and inaccessibility of the site, site inspections required under this part shall be conducted at appropriate intervals specified in the plan, but, in no case less than once in 3 years.

4. Numeric Effluent Limitations. There are no additional numeric effluent limitations beyond those described in Part I.E. of this permit.

5. Monitoring and Reporting Requirements.

a. Benchmark Analytical Monitoring Requirements. The permittee must monitor their storm water discharges associated with industrial activity at least quarterly (4 times per year) during years 2 and 4 of the permit cycle except as provided in paragraphs 5.a.(3) (Sampling Waiver), 5.a.(4) (Representative Discharge), and 5.a.(5) (Alternative Certification). The permittee is required to monitor their storm water discharges for the pollutants of concern listed in Table E. below. Reports must be made in accordance with 5.b. (Reporting). In addition to the parameters listed in Table E. below, the permittee must provide the date and duration (in hours) of the storm event(s) sampled; rainfall measurements or estimates (in inches) of the storm event that generated the sampled runoff; the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge sampled.

The results of benchmark monitoring are primarily for the permittee's use to determine the overall effectiveness of the SWPPP in controlling the discharge of pollutants to receiving waters. Benchmark values are not viewed as permit limitations. An exceedence of a benchmark value does not, in and of itself, constitute a violation of this permit. While exceedences of a benchmark value does not automatically indicate a violation of a water quality standard has occurred, it does signal that modifications to the SWPPP or

more specific pollution prevention controls may be necessary.

Table E.
Monitoring Requirements for Coal Mining Facilities

Pollutants of Concern	Cut-Off Concentration
Total Recoverable Aluminum	0.75 mg/L
Total Recoverable Iron	1.0 mg/L
Total Suspended Solids	100 mg/L

1) Monitoring Periods. The permittee shall monitor samples collected during the sampling periods of: January through March, April through June, July through September, and October through December during the second and fourth years of this permit cycle.

2) Sample Type. A minimum of one grab sample shall be taken. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where the permittee documents that less than a 72-hour interval is representative for local storm events during the season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the non-storm water discharge.

3) Sampling Waiver.

a) Adverse Conditions. If the permittee is unable to collect samples within a specified sampling period due to adverse climatic conditions, thus a substitute sample shall be collected from a separate qualifying event in the next monitoring period and the data submitted along with the data for the routine sample in that period. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricanes, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

b) Low Concentration Waiver. When the average concentration for a pollutant calculated from all monitoring data collected from an outfall during the second year monitoring is less than the corresponding value for that pollutant listed in Table E. under the column Monitoring Cut-Off Concentration, the permittee may waive monitoring and reporting requirements for the fourth year monitoring period. The permittee

must submit to the Executive Secretary, in lieu of the monitoring data, a certification that there has not been a significant change in industrial activity or the pollution prevention measures in area of the facility that drains to the outfall for which sampling was waived.

c) Inactive and Unstaffed Site. If the permittee is unable to conduct quarterly chemical storm water sampling at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirements as long as the facility remains inactive and unstaffed. The permittee must submit to the Executive Secretary, in lieu of monitoring data, a certification statement on the Storm Water Discharge Monitoring Report (SWDMR) stating that the site is inactive and unstaffed so that collecting a sample during a qualifying event is not possible.

4) Representative Discharge. If the permittee has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan. The permittee shall include the description of the location of the outfalls, explanation of why outfalls are expected to discharge substantially identical effluents, and estimate of the size of the drainage area and runoff coefficient with the SWDMR.

5) Alternative Certification. The Permittee is not subject to the monitoring requirements of this section provided that certification is made for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring reports required under paragraph b. below, under penalty of law, signed in accordance with Part IV.G.4. (Signatory Requirements). The Certification shall state that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan, and submitted to DWQ in accordance with Part II.D. of this permit. In the case of certifying that a pollutant is not present, the permittee must submit the certification along with the monitoring reports required under paragraph b. below. If the permittee cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations.

b. Reporting. The permittee shall submit monitoring results for each outfall associated with

industrial activity [or a certification in accordance with Sections (3), (4), or (5) above] obtained during the second year reporting period, on Storm Water Discharge Monitoring Report (SWDMR) form(s) postmarked no later than the 31st day of the following March. Monitoring results [or a certification in accordance with Sections (3), (4), or (5) above] obtained during the fourth year reporting period shall be submitted on SWDMR form(s) postmarked no later than the 31st day of the following March. For each outfall, one signed SWDMR form must be submitted to the Executive Secretary per storm event sampled. Signed copies of SWDMRs, or said certifications, shall be submitted to the Executive Secretary at the address listed in Part II.D. of the permit.

c. Visual Examination of Storm Water Quality. The permittee shall perform and document a visual examination of a representative storm water discharge at the following frequencies: quarterly for active areas under SMCRA bond located in areas with average annual precipitation over 20 inches; semi-annually for inactive areas under SMCRA bond, and active areas under SMCRA bond located in areas with average annual precipitation of 20 inches or less; visual examinations are not required at inactive areas not under SMCRA bond.

1) Visual Monitoring Periods. Examinations shall be conducted in each of the following periods for the purposes of visually inspecting storm water runoff or snow melt: Quarterly-January through March; April through June; July through September; and October through December. Semi-annually—January through June and July through December.

2) Sample and Data Collection. Examinations shall be made of samples collected within the first 60 minutes (or as soon thereafter as practical, but not to exceed two hours) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well-lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual will carry out the collection and examination of discharges for the life of the permit.

3) Visual Storm Water Discharge Examination Reports. Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10*, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The *Act* provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. Reporting of Monitoring Results. Monitoring results obtained during the previous month shall be summarized for each month and reported monthly on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. The first report for the May 2009 monitoring period is due on June 28, 2009. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part IV.G)*, and submitted to the Director, Division of Water Quality at the following address:

original to: Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870

E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* or as otherwise specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

G. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements:
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

H. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location.

I. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall (orally) report any noncompliance which may seriously endanger health or environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 538-6146, or 24 hour answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

   a. Any noncompliance which may endanger health or the environment;

   b. Any unanticipated bypass which exceeds any effluent limitation in the permit (See *Part III.G, Bypass of Treatment Facilities.)*;

   c. Any upset which exceeds any effluent limitation in the permit (See *Part III.H, Upset Conditions.*); or,

   d. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit.

3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

   a. A description of the noncompliance and its cause;

   b. The period of noncompliance, including exact dates and times;

   c. The estimated time noncompliance is expected to continue if it has not been corrected; and,

   d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

   e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Executive Secretary may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 538-6146.

5. Reports shall be submitted to the addresses in *Part II.D, Reporting of Monitoring Results.*

J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part II.D* are submitted. The reports shall contain the information listed in *Part II.I.3*.

K. Inspection and Entry. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The *Act* provides that any person who violates a permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions of the Act is subject to a fine not exceeding $25,000 per day of violation; Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at *Part III.G, Bypass of Treatment Facilities* and *Part III.H, Upset Conditions*, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. Removed Substances. Collected screening, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to parts 2. and 3. of this section.

2. Prohibition of Bypass.

   a. Bypass is prohibited, and the Executive Secretary may taken enforcement action against a permittee for bypass, unless:

      (1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;

(2) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and

(3) The permittee submitted notices as required under section G.3.

b. The executive Secretary may approve an anticipated bypass, after considering its adverse effects, if the Executive Secretary determines that it will meet the three conditions listed in sections G.2a. (1), (2) and (3).

3. Notice.

a. Anticipated bypass. Except as provided above in section G.2. and below in section G. 3.b, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Executive Secretary:

(1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages:

(2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Executive Secretary in advance of any changes to the bypass schedule;

(3) Description of specific measures to be taken to minimize environmental and public health impacts;

(4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

(5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and

(6) Any additional information requested by the Executive Secretary.

b. Emergency Bypass. Where ninety days advance notice is not possible, the permittee must notify the Executive Secretary, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Executive Secretary the information in section G.3.a.(1) through (6) to the extent practicable.

c. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass to the Executive Secretary as required under Part II.I., Twenty Four Hour Reporting. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2. of this section are met. Executive Secretary's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that the permittee can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. The permittee submitted notice of the upset as required under Part II.I, Twenty-four Hour Notice of Noncompliance Reporting; and,

   d. The permittee complied with any remedial measures required under Part III.D, Duty to Mitigate.

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Toxic Pollutants. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of *The Water Quality Act of 1987* for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

J. Changes in Discharge of Toxic Substances. Notification shall be provided to the Executive Secretary as soon as the permittee knows of, or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

   a. One hundred micrograms per liter (100 ug/L);

   b. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

   c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(7)* or (10); or,

   d. The level established by the Executive Secretary in accordance with *UAC R317-8-4.2(6)*.

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

a. Five hundred micrograms per liter (500 ug/L);

b. One milligram per liter (1 mg/L) for antimony:

c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(9)*; or,

d. The level established by the Executive Secretary in accordance with *UAC R317-8-4.2(6)*.

K. Industrial Pretreatment. Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of *The Water Quality Act of 1987*, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at *40 CFR 403*, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with *40 CFR 403.12(p)(1)*, the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under *40 CFR 261*. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

V. GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Executive Secretary of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official

2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under paragraph IV.G.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph IV.G.2 must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports. The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Executive Secretary. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Executive Secretary at least 20 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

N. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117.*

O. Water Quality-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. A revision to the current Water Quality Management Plan is approved and adopted which calls for different effluent limitations than contained in this permit.

P. Toxicity Limitation-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include whole effluent toxicity (WET) testing, a WET limitation, a compliance schedule, a compliance date, additional or modified numerical limitations, or any other conditions related to the control of toxicants if toxicity is detected during the life of this permit.

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GLOSSARY OF TERMS

A. Definitions.

1. The "30-day (and monthly) average" is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

2. The "7-day (and weekly) average" is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self- monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains the Saturday.

3. "Daily Maximum" ("Daily Max.") is the maximum value allowable in any single sample or instantaneous measurement.

4. "Composite samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the composite sample period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

   a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

   b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

   c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,

   d. Continuous collection of sample, with sample collection rate proportional to flow rate.

5. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

6. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

7. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

8. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

9. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. "Executive Secretary" means Executive Secretary of the Utah Water Quality Board.

11. "EPA" means the United States Environmental Protection Agency.

12. "Act" means the "*Utah Water Quality Act*".

13. "Best Management Practices" ("*BMPs*") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. *BMPs* also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

14. "Coal pile runoff" means the rainfall runoff from or through any coal storage pile.

15. "*CWA*" means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.

16. "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agriculture storm water runoff.

17. "Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under *Section 311* of the *Clean Water Act* (see *40CFR 110.10* and *40 CFR 117.21)* or *Section 102* of the *CERCLA* (see *40 CFR 302.4)*.

18. "Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

19. "Waste pile" means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage.

20. "10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in *Weather Bureau Technical Paper no. 40,* May 1961 and *NOAA Atlas 2,* 1973 for the 11 Western States, and may be obtained from the National Climatic center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

21. The term "coal preparation plant" means a facility where coal is crushed, screened, sized and cleaned, dried, or otherwise prepared and loaded for transit to a consuming facility.

22. The term "coal preparation plant associated areas" means the coal preparation plant yards, immediate access roads, coal refuse piles, and coal storage piles and facilities.

Appendix 7-13

Petersen Hydrologic, LLC hydrologic investigation to evaluate the acid/neutralization behavior of groundwater in the coal seam

PETERSEN HYDROLOGIC

26 August 2011

Mr. Kirk Nicholes
Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, Utah 84721

Kirk,

At your request, we have investigated the groundwater quality of wells completed in the Smirl coal seam in the Coal Hollow Mine area. The purpose of this investigation is to evaluate the acid/neutralization behavior of groundwater in the coal seam. As part of this investigation we have evaluated water quality in groundwaters sampled from coal monitoring wells Y-36, Y-38, Y-45, and Y-49. Monitoring well Y-99 (A2) is screened in alluvium and has consistently been dry. Accordingly, no analysis of water quality in that monitoring well may be performed. Monitoring well locations are shown on Figure 1.

Water quality information for these wells is presented in Table 1. Information in Table 1 was obtained from a mining and reclamation plan (MRP) previously submitted to the Utah Division of Oil, Gas and Mining (Division) by Utah International, Inc. The Utah International permit application (which was determined to be administratively complete) was obtained from the files of the Division in Salt Lake City.

It is apparent from the data in Table 1 that the groundwater monitored in the Smirl coal seam is consistently neutral to alkaline in character, with pH values ranging from 7.2 to

9.3. The average pH of all samples analyzed is 7.8. The alkalinity of the groundwater sampled in the Smirl coal seam is substantial (Table 1). The average alkalinity (expressed in milligrams per liter as $CaCO_3$ in Table 1) for all samples analyzed is 1,039 mg/L.

No information on acidity is provided in the Utah International data set presented in Table 2. However, an evaluation of the solute chemical composition of the groundwater in the coal seam suggests that elevated acidity is likely not present. For acidity to be present in a water sample, an anion of an acid stronger than carbonic acid must be present. In natural waters, that anion is commonly sulfate (Drever, 1988). As shown in Table 1, sulfate concentrations of groundwaters in the coal seam are generally relatively low, with the average sulfate concentration for all samples analyzed being about 12 mg/L. Hydrolyzable cations such as aluminum and iron contribute to acidity because they are titratable by base (Drever, 1988). As shown in Table 1, concentrations of iron and aluminum are generally low.

It is noteworthy that, using analytical method ASTM D-1067 for acidity determinations, a sample is titrated using a basic solution to a pH endpoint of 8.3 (the calculated acidity value is a function of the amount of base required to titrate the pH to 8.3). Accordingly, by definition a sample with a pH of 8.3 or greater would have no appreciable acidity. Thus, it is apparent that *no* acidity would be present in the groundwater sampled from coal monitoring well Y-38 had that water been analyzed for acidity.

References Cited

Drever, James I., 1988, The geochemistry of natural waters, second edition, Prentice Hall, Inc., Englewood Cliffs, New Jersey.

PETERSEN HYDROLOGIC

Please feel free to contact me should you have any questions in this regard.

Regards,

Erik C. Petersen, P.G.
Principal Hydrogeologist
Utah PG #5373615-2250

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

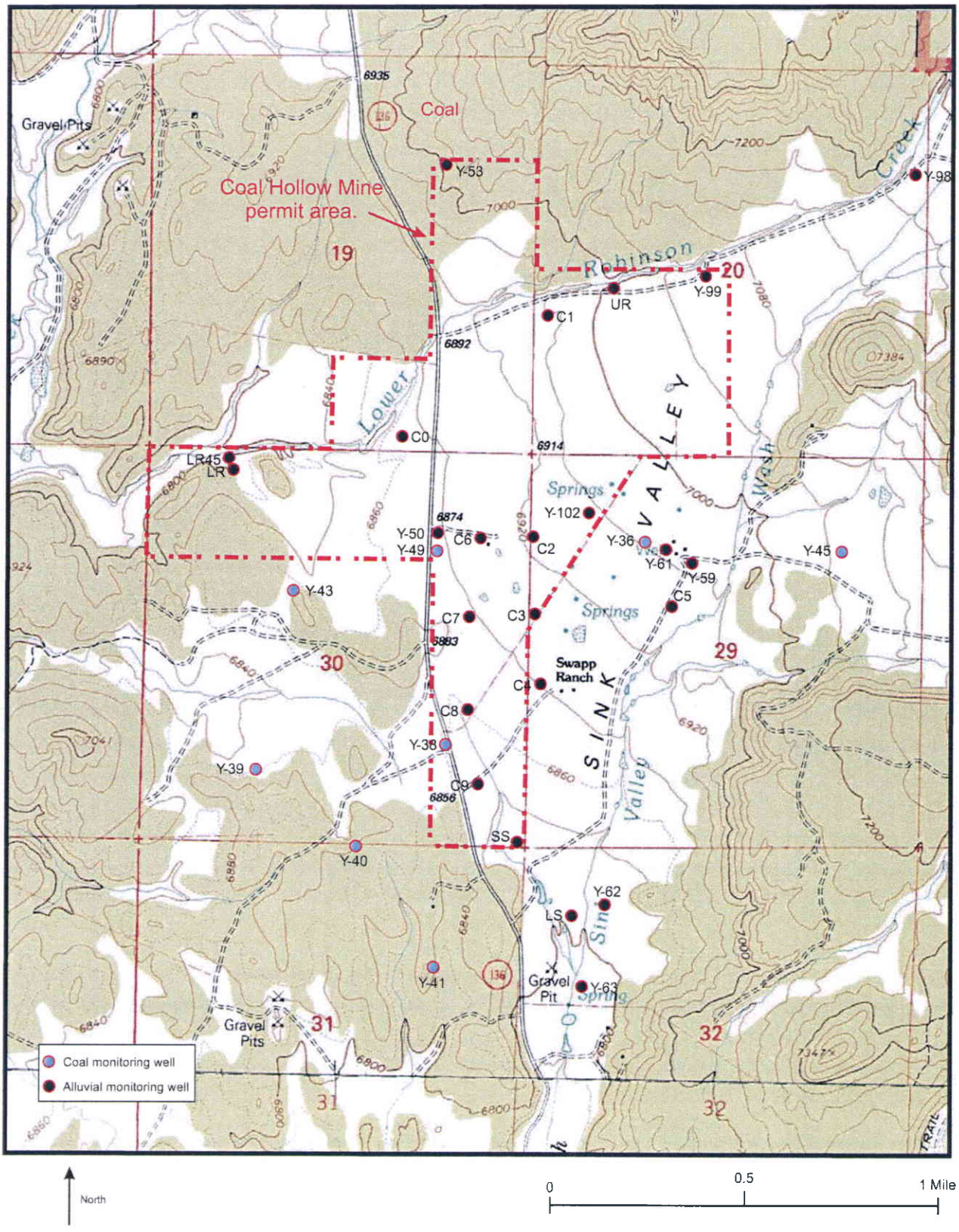


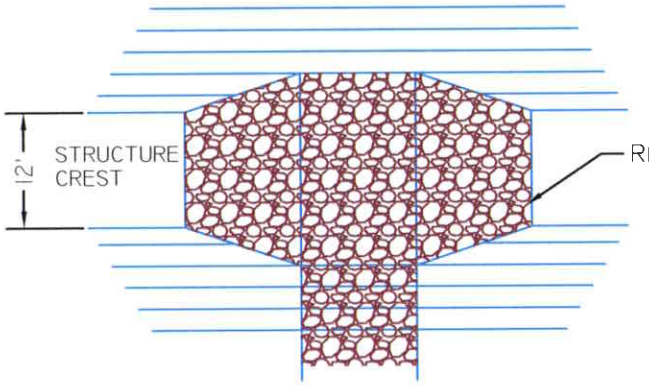
Figure 1 Monitoring well locations.

Field and laboratory water quality data for selected wells in the Coal Hollow Mine area.

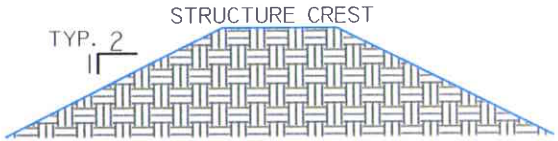
	Date	Water elev. feet	pH (S.U.)	Sp. Cond. (uS/cm)	TDS (mg/L)	Temp. (Deg.C)	D-Ca (mg/L)	D-Mg (mg/L)	D-Na (mg/L)	D-K (mg/L)	HCO_3 (mg/L $CaCO_3$)	CO_3 (mg/L $CaCO_3$)	Cl (mg/L)	SO_4 (mg/L)	Fl (mg/L)	D-Al (mg/L)	D-As (mg/L)	D-Ba (mg/L)	D-B (mg/L)	D-Cd (mg/L)	D-Cr (mg/L)	D-Cu (mg/L)	D-Fe (mg/L)	D-Pb (mg/L)	D-Mn (mg/L)	D-Hg (mg/L)	D-Mo (mg/L)	D-Ni (mg/L)	D-Se (mg/L)	D-Zn (mg/L)	Hardness (mg/L $CaCO_3$)	NH_4 (mg/L)	NO_3 (mg/L)	NO_2 (mg/L)	O-PO_4 (mg/L)	Sulfide (mg/L)
Coal Wells																																			
Y-36	11/1980		8.0	1260	1010		24	5	350	5	791	0	41	85	3.84	11	0.003		2.8	<0.01	<0.01	0.05	0.11	0.04	<0.01	<0.0005	0.1	0.02	0.001	3.83	95		0.5	<0.01	0.44	
Y-36	7/28/1986	6876.2	8.25	1234	835	14.0	4	1	368	2	670	16	47	6	4	0.08	<0.001	0.25	1.65	<0.005	<0.01	<0.01	0.04	<0.02	0.04	<0.0002	<0.05	<0.02	<0.001	0.22	14	0.51	<0.02	0	0.05	0.3
Y-36	8/27/1986	6876.2	8.15	1250		13.5																													
Y-36	9/19/1986	6876.3	8.2	1225	796	11.1	3	1	363	2	660	10	45	4	4.4	<0.05	0.001	0.14	1.57	<0.005	<0.01	0.02	0.02	<0.02	0.02	<0.0002	<0.05	<0.02	<0.001	0.12	12	0.42	<0.02	<0.02	0.08	<0.2
Y-36	10/27/1986	6876.4	8.1	1335		8																													
Y-36	11/14/1986	6876.4	8.00	1205		9.5																													
Y-36	12/10/1986	6876.7	7.8	1230	784	10.5	3	1	339	2	650	0	46	<2	4	0.06	<0.001	0.14	1.63	<0.005	<0.01	<0.01	0.06	<0.02	0.02	<0.0002	<0.05	<0.02	0.001	0.05	12	0.5	0.02	<0.02	0.05	<0.2
Y-36	1/9/1987	6876.8	8.1	1185		8.0																													
Y-36	7/4/1987	6876.70	8.15	1360		12																													
Y-36	8/6/1987	6876.70	8.05	—		12.6																													
Y-36	9/17/1987	6876.33	7.2	1320	815	10.2	4	1	397	2	630	0	50	<2	3.9	<0.05	<0.001	0.22	1.69	<0.005	<0.01	0.01	0.05	<0.02	0.02	<0.002	<0.05	<0.02	<0.001	0.02	14	0.54	0.02	<0.01	0.03	0.3
Y-36	11/20/1987	6876.50	8.1	1580		6																													
Y-36	12/15/1987	6876.60	7.9	1320	784	9.9	3	1	316	2	616	0	54	10	3.9	0.08	<0.001	0.14	1.49	<0.005	<0.01	0.01	0.05	<0.02	0.1	<0.002	<0.05	<0.02	<0.001	0.01	12	0.49	<0.02	<0.01	<0.01	<0.2
Y-36	12/15/1987	6876.50	7.9	1320		9.9																													
Y-38	11/1980		9.3	2805	1810		61	3	700	19			230	80	1.56	2.3	0.003		3.1	<0.01	0.05	0.04	0.02	0.02	0.01	0.0008	0.1	0.03	0.001	0.25	179		0.2	<0.01	0.27	
Y-38	6/24/1986	6812.30	9.1	2695		11.5																													
Y-38	9/3/1987	6811.20	8.7	3310		11.4																													
Y-38	12/13/1987	6811.40	8.5	3090		9.9																													
Y-45	11/1980		7.8	3000	2390		39	8	990	14	1350	0	690	22	1.46								0.11		0.03						89		0.2	0.08		
Y-45	7/22/1986	6796.17	7.65	4430	2730	14	15	7	1310	6	1110	0	888	<2	1.5	<0.05	<0.001	0.7	2.2	<0.005	<0.01	<0.01	0.02	<0.02	<0.01	<0.0002	<0.05	<0.02	<0.001	0.37	66	1.91	<0.02	<0.02	<0.02	<0.2
Y-45	9/22/1986	6796.12	7.55	4300	2650	12.1	16	7	1150	6	1205	0	890	4	1.5	<0.05	0.001	0.77	2.2	<0.005	<0.01	<0.01	0.03	<0.02	<0.01	<0.0002	<0.05	<0.02	<0.001	0.01	69	1.83	<0.02	<0.02	0.02	<0.2
Y-45	12/31/1986	6796.14	7.6	4375	2658	11.9	16	7	1147	5	1168	0	918	8	1.5	0.06	<0.001	0.72	2.43	<0.005	<0.01	<0.01	<0.02	<0.02	<0.01	<0.0002	<0.05	<0.02	<0.001	0.1	69	1.97	<0.02	<0.02	0.03	<0.2
Y-45	7/4/1987	6796.60	7.7	5250		13.3																													
Y-45	8/5/1987	6796.50	7.6	5750		13.9																													
Y-45	9/17/1987	6796.61	7.7	5015	3200	12.8	15	6	1150	7	1068	0	908	<2	1.8	<0.05	<0.001	0.8	2	<0.005	<0.01	0.02	0.05	<0.02	<0.01	<0.0002	<0.05	<0.02	<0.001	0.02	62	2.02	<0.02	<0.01	0.02	<0.2
Y-45	11/20/1987	6797.50	7.7	4665		12.5																													
Y-45	12/15/1987	6800.15	7.5	4790	2606	13.8	16	7	1070	8	1127	0	867	4	1.4	0.1	<0.001	0.7	1.97	<0.005	<0.01	0.01	0.03	0.03	<0.01	<0.0002	<0.05	<0.02	<0.001	0.01	69	1.87	<0.02	<0.01	<0.01	0.5
Y-45	3/21/1988	6796.82	7.6	5550	2816	14	19	8	1210	7	1233	0	960	<2	1.5	<0.05	<0.001	0.7	2.25	<0.005	<0.01	<0.01	0.02	<0.02	<0.01	<0.002	<0.05	<0.02	<0.001	0.01	80	1.86	0.02	<0.01	0.02	0.2
Y-49	11/1980		8.4	3860	3250		45	12	1100	14			510	7	129	0.7	0.001		4.2	<0.01	0.07	0.04	<0.01	0.03	0.11	<0.0005	0.1	0.04	0.001	0.5	190		0.1	0.09	0.12	
Y-49	6/24/1986	6832.60	7.5	4020	2635	13	19	8	1029	7	1272	0	785	<2	1.31	<0.05	0.001	0.27	1.45	<0.005	<0.01	<0.01	0.03	<0.02	<0.01	<0.0002	<0.05	<0.02	<0.001	0.02	80	1.61	0.02	<0.02	0.05	
Y-49	8/3/1986	6831.40	7.6	4135		13.5																													
Y-49	9/7/1986	6831.10	7.45	3980		12.5																													
Y-49	10/2/1986	6831.40	7.45	4470	2748	10	20	5	1200	6	1304	0	830	<2	1.4	<0.05	<0.001	0.26	1.71	<0.005	<0.01	<0.01	0.03	<0.02	<0.01	<0.0002	<0.05	<0.02	0.001	<0.01	71	1.62	<0.02	<0.02	0.07	1.3
Y-49	10/24/1986	6831.20	7.45	4270		11.9																													
Y-49	11/12/1986	6831.00	7.55	4335		10.7																													
Y-49	12/6/1986	6830.30	7.4	4185	2644	8.8	19	8	1152	6	1302	0	816	<2	1.3	<0.05	<0.001	0.25	1.64	<0.005	<0.01	<0.01	0.02	<0.02	<0.01	<0.002	<0.05	<0.02	0.001	<0.01	80	1.75	<0.02	<0.02	0.06	0.7
Y-49	1/10/1987	6831.10	7.5	4190		9.9																													
Y-49	1/31/1987	6831.00	7.5	4190		9.5																													
Y-49	7/3/1987	6830.70	7.55	5015		11																													
Y-49	8/5/1987	6830.60	7.55	5360		11.7																													
Y-49	9/18/1987	6830.44	7.5	4760	2514	10.9	19	8	1120	6	1220	0	788	<2	1.5	<0.05	<0.001	0.28	1.53	<0.005	<0.01	<0.01	0.04	<0.02	0.01	<0.0002	<0.05	<0.02	<0.001	<0.01	80	1.68	<0.02	<0.01	0.02	0.8
Y-49	11/22/1987	6830.60	7.5	4770		11																													
Y-49	12/8/1987	6830.44	7.5	4705	2636	10.0	20	8	1160	7	1288	0	780	<2	1.4	0.12	<0.001	0.24	1.6	0.006	0.01	<0.01	0.07	<0.02	0.02	<0.0002	<0.05	<0.02	<0.002	0.01	83	1.69	<0.02	<0.02	0.04	0.2
Y-49	3/11/1988	6830.46	7.8	4745	2678	9.9	15	7	1110	7	1081	0	816	4	1.3	<0.05	<0.001	0.22	1.49	<0.005	<0.01	<0.01	0.03	<0.02	<0.01	<0.0002	<0.050	<0.02	<0.001	<0.01	66	1.72	0.08	<0.01	0.07	<0.2

Alluvial Wells

Y-99 (A2)	7/2/1987	Well is dry
Y-99 (A2)	8/4/1987	Well is dry
Y-99 (A2)	9/16/1987	Well is dry
Y-99 (A2)	10/27/1987	Well is dry
Y-99 (A2)	11/15/1987	Well is dry
Y-99 (A2)	12/4/1987	Well is dry
Y-99 (A2)	1/5/1988	Well is dry
Y-99 (A2)	2/20/1988	Well is dry
Y-99 (A2)	3/18/1988	Well is dry
Y-99 (A2)	5/27/2005	Well is dry
Y-99 (A2)	11/4/2005	Well is dry
Y-99 (A2)	5/29/2006	Well is dry
Y-99 (A2)	9/8/2006	Well is dry
Y-99 (A2)	12/21/2006	Well is dry
Y-99 (A2)	3/28/2007	Well is dry
Y-99 (A2)	6/21/2007	Well is dry
Y-99 (A2)	9/29/2007	Well is dry
Y-99 (A2)	11/29/2007	Well is dry
Y-99 (A2)	6/18/2008	Well is dry
Y-99 (A2)	8/20/2008	Well is dry
Y-99 (A2)	3/19/2009	Well is dry
Y-99 (A2)	5/25/2009	Well is dry



PLAN



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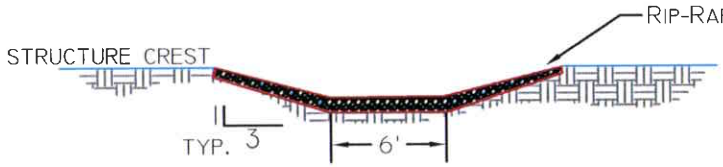

PROFILE

DRAWN BY: J. STANSFIELD	CHECKED BY: CRM	IMPOUNDMENT SPILWAY DETAIL COAL HOLLOW PROJECT ALTON, UTAH DRAWING: 5-32	STATE OF UTAH No.167590 LarryJ.Adams REGISTERED PROFESSIONAL ENGINEER 6/14/11
DRAWING: 5-32	DATE: 4/20/07 Revised 6/14/11		
	SCALE: 1" = 20'		
JOB NUMBER: 1400	SHEET		

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