



State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA
Division Director

Inspection Report

Permit Number:	C0250005
Inspection Type:	PARTIAL
Inspection Date:	Friday, October 26, 2012
Start Date/Time:	10/26/2012 10:00:00 AM
End Date/Time:	10/26/2012 2:00:00 PM
Last Inspection:	Tuesday, October 16, 2012

Representatives Present During the Inspection:	
OGM	Priscilla Burton
Company	Kirk Nicholes

Inspector: Priscilla Burton,

Weather: sun 50 F

InspectionID Report Number: 3272

Accepted by: jhelfric
10/29/2012

Permittee: **ALTON COAL DEVELOPMENT LLC**
 Operator: **ALTON COAL DEVELOPMENT LLC**
 Site: **COAL HOLLOW**
 Address: **463 North 100 West, Suite 1, CEDAR CITY UT 84720**
 County: **KANE**
 Permit Type: **PERMANENT COAL PROGRAM**
 Permit Status: **ACTIVE**

Current Acreages

635.64	Total Permitted
289.00	Total Disturbed
	Phase I
	Phase II
	Phase III

Mineral Ownership

- Federal
- State
- County
- Fee
- Other

Types of Operations

- Underground
- Surface
- Loadout
- Processing
- Reprocessing

Report summary and status for pending enforcement actions, permit conditions, Division Orders, and amendments:

Seven acres on the toe slope of the west end of the Excess Spoils pile had been drill seeded with a mycorrhizae amendment. Straw and Nutri-Mulch, a turkey manure based soil amendment(1%N:1%P:1%K), were being spread over the drilled surface and will be crimped in. Sagebrush and winterfat seeds were included in the drill seeding, but will also be broadcast over the surface. The reclamation work is being done by Kevin Heaton. Seed mix, mychorrhizal tag and nutrimulch information are attached to this report. Refer to Topsoil Handling Dwg 2-2 for topsoil stockpile locations. This report also references Drawings 5-3 and 5-10 of the MRP.

I also observed and photographed the 8 reclaimed drill sites on fee coal north of the permit area. These sites were drilled and seeded in July 2012 (Task 4099). Refer to Map 3 of the exploration application for drill hole locations.

Inspector's Signature:
 Priscilla Burton,
 Inspector ID Number: 37

Date: Monday, October 29, 2012



REVIEW OF PERMIT, PERFORMANCE STANDARDS PERMIT CONDITION REQUIREMENTS

1. Substantiate the elements on this inspection by checking the appropriate performance standard.
 - a. For COMPLETE inspections provide narrative justification for any elements not fully inspected unless element is not appropriate to the site, in which case check Not Applicable.
 - b. For PARTIAL inspections check only the elements evaluated.
2. Document any noncompliance situation by reference the NOV issued at the appropriate performance standard listed below.
3. Reference any narratives written in conjunction with this inspection at the appropriate performance standard listed below.
4. Provide a brief status report for all pending enforcement actions, permit conditions, Divison Orders, and amendments.

	Evaluated	Not Applicable	Comment	Enforcement
1. Permits, Change, Transfer, Renewal, Sale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Signs and Markers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Topsoil	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.a Hydrologic Balance: Diversions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4.b Hydrologic Balance: Sediment Ponds and Impoundments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.c Hydrologic Balance: Other Sediment Control Measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.d Hydrologic Balance: Water Monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.e Hydrologic Balance: Effluent Limitations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Explosives	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Disposal of Excess Spoil, Fills, Benches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Coal Mine Waste, Refuse Piles, Impoundments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Noncoal Waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Protection of Fish, Wildlife and Related Environmental Issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Slides and Other Damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Contemporaneous Reclamation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Backfilling And Grading	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13. Revegetation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14. Subsidence Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Cessation of Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.a Roads: Construction, Maintenance, Surfacing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
16.b Roads: Drainage Controls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Other Transportation Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Support Facilities, Utility Installations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. AVS Check	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Air Quality Permit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Bonding and Insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3. Topsoil

Approximately 7,528 cu yds of topsoil from topsoil stockpile #3 was placed 8 inches deep on top of the 3 ft subsoil cover over the 7 acre area. Plans are to utilize the remaining 23,000 cu yds of topsoil in stockpile #3 before this winter. This stockpile is not long term, but will be reshaped and seeded if it is not utilized in 2012, so as to provide erosion protection, per plan Section 231.100. This situation was not anticipated by the MRP. As I discussed with Mr. Nicholes, I think it is appropriate to seed a single species at the end of 2012 to achieve a quick, effective, short-term cover on what remains of Topsoil pile #3.

Subsoil pile #1 was regraded and drill seeded with the interim mix this fall.

4.a Hydrologic Balance: Diversions

Ditch 4 is in place on the north side of the Excess Spoil pile. The slope below the ditch has been covered with topsoil, but has not been seeded yet.

Water emanating from the alluvium is entering pit #7 at an approx. rate of 15 gpm. This water is being pumped from the pit and is used for dust control.

5. Explosives

Pit 6 coal is exposed and ready for drilling and setting small (less than 0.5 lb) charges to lift the coal and make it easier to load. (See Dwg 5-10 for pit location.)

6. Disposal of Excess Spoil, Fills, Benches

Pits 6 and 7 are open and in various stages of development. The length of the pit wall where coal has been exposed is approximately 1,000 ft. long (see Dwg 5-10). Overburden from pit 6 is being hauled to the Excess Spoil pile.

12. Backfilling And Grading

The respread topsoil was sampled and analyzed. Analytical results are attached. A low nutrient formulation of Nutri-mulch (composted Turkey manure from Manti) is being spread at a rate of 1 ton per acre. Mr Heaton described the Nutri-mulch formulation as 1:1:1 and indicated at that rate the application rate would provide 20 lbs N/acre. (The Nutri Mulch web site guarantees a formulation of 1% N:1% P2O5:1% K2O, but provides analysis with a chemical composition of 2% N :2.6% P2O5 :1.8% K2O, which at 1 ton/ac would apply 40 lbs N/ac.) So the rate of application is not precisely known, because the bags are not labeled except for the minimum 1:1:1 content. One T/ac straw was also applied on the surface of the drill seeded area. This will be crimped into the surface to a depth of approximately 4 inches with another pass of the crimper.

13. Revegetation

Mycorrhizae, the seed mix and supplemental forb mix were drilled using a rangeland drill seeder. Mycorrhizae, mix, and forb supplement are attached. The twenty pound bags of mycorrhizae supplement provided two species of fungus as follows: 50% Glomus intraradices (UT), 25% Glomus intraradices (AZ), 25% Glomus etunicatum (NE). Broadcast seeding of Mountain big sage and winterfat will follow the crimping of the straw/nutrimulch.

16.a Roads: Construction, Maintenance, Surfacing

A haul road will be constructed across ditch DD 4 to provide access to sediment pond #3 when the current access is overtaken by the excess spoil pile (as shown on Dwg 5-3).

22. Other

I photographed 8 exploration holes (#1-5 and #7-10) on fee lands to the north. (Holes 6 and 7 were not drilled.) These holes were drilled and reclaimed in July 2012, see Task 4099 for further information. Holes were marked and identified. In most locations, the disturbance was extremely small (5 ft. x 5 ft.). In a couple locations the disturbance was a bit larger 15 ft. x 15 ft. Where cows have been excluded, the reseeded grass is emerging. Where cows have access (sites 4 & 5), the disturbed soil is preferred by the animals for resting and vegetation can not take hold. These areas may be reseeded when the animals are removed.

Coal Hollow Mine Inspection Report #3272 Attachment

Excess Spoil Pile reclamation



Excess spoil pile in far ground. DD #4 is on the right side of the haul road, next to the graded area in the center of the photo.



Excess Spoil pile: spoil in foreground; three feet of subsoil and 8 inches of topsoil in far ground.



Drill seeded surface of west end of spoil pile.



Tractor scattering straw and nutri-mulch



Nutri-mulch



Straw and nutri-mulch on surface before crimping.

Coal Hollow Mine Inspection Report #3272 Attachment



crimper



Regraded and drill-seeded subsoil stockpile #1



Exploration site 1



Exploration site 2



Exploration site 3



Exploration site 4

Coal Hollow Mine Inspection Report #3272 Attachment



Exploration site 5.



Exploration site 8.



Exploration site 9



Exploration site 10



Kanab Creek at SW 2

From: Granite Seed - Lehi
1697 W 2100 N
Lehi, UT 84043

1-13486

Mix Name: Reclamation Project

Reclamation Project

Mix # 107176

G + D each

Origin

% Pure Component	Name	Variety	G + D each	Origin
13.8	ANTELOPE BITTERBRUSH	VNS	82.7Z	NV
8.90	SLENDER WHEATGRASS	Reverie	91 + 0	CAN
8.53	WESTERN WHEAT GRASS	Ambs	95.7Z	WA
8.31	BLUEBUNCH WHEAT GRASS	Secar	85.7Z	CA
8.18	BLUEBUNCH WHEAT GRASS	VNS	66.7Z	CO
7.11	UTAH BUCKWHEAT	VNS	76.7Z	NM
6.21	WINTERPAT	Temp	87.7Z	CO
5.75	UTAH NORTHERN SWEET VETCH	VNS	73 + 71	UT
5.63	MOUNTAIN LUPINE	VNS	95.7Z	UT
5.51	INDIAN ROEGRASS	Rimrock	88.7Z	TW
1.54	SHOWY GOLDENEYE	VNS	70.7Z	UT
1.33	BLACK SAGEBRUSH	VNS	81.7Z	UT
1.30	SCARLET GLOBEWALLOW	VNS	93.7Z	UT
1.15	BLUEGRASS, SANDEBERG	MT-1	9a.7Z	WA
0.80	KENTUCKY BLUEGRASS	Ginger	90 + 0	WA
0.43	MOUNTAIN BIG SAGEBRUSH	VNS	87.7Z	UT
0.24	LOUISIANA SAGEBRUSH	VNS	89.7Z	WV

29-SEP-11

Date Tested

% Hard Seed 1.25

Refracted Weed None

10.33 inert Matter

0.04 Weed Seeds

Net Weight 26.56

Lbs PLS 35.12

LOS Bulk

NOTICE TO BUYER LIMITATIONS OF WARRANTIES AND REMEDIES

Crop yield and quality are dependent upon many factors beyond the control of the labeled seller and NO WARRANTY is made for crop yield and quality. The labeled seller warrants that all seed sold has been labeled as required under applicable state and federal seed laws and that the seed conforms to the label description, within recognized tolerances. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE LABEL.

No claim shall be asserted against the labeled seller, unless Buyer reports to the labeled seller within a reasonable period after discovery (not to exceed thirty days), any condition that might lead to a complaint. BUYER'S EXCLUSIVE REMEDY FOR ANY CLAIM OR LOSS RESULTING FROM BREACH OF WARRANTY, BREACH OF CONTRACT OR NEGLIGENCE (INCLUDING BUT NOT LIMITED TO INCIDENTAL OR CONSEQUENTIAL DAMAGES) SHALL BE LIMITED TO REPAIRMENT OF THE PURCHASE PRICE.

By acceptance of the seed, Buyer agrees the terms and conditions stated above are a benefit to the bargain and constitute the entire agreement between Buyer and the labeled seller. Buyer shall return the original unopened seed package to the labeled seller within twenty days of receipt for a refund of the purchase price if not accepted under these terms.

NOTICE: REQUIRED ARBITRATION / CONCILIATION / MEDIATION

The seed laws of several states including Arkansas, California, Colorado, Florida, Georgia, Idaho, Illinois, Indiana, Minnesota, Mississippi, North Dakota, South Carolina (Section 46-21-260), South Dakota, Texas and Washington require arbitration, conciliation or mediation of disputes involving alleged defective seed before certain legal actions may be maintained against a seller. North Carolina offers an alternative to court action that allows claims to be investigated by the State Plant Board. A complaint (form for AR, CO, FL, IL, IN, MN, MS, NC, SC, TX, WA, signed only by the Commissioner of Agriculture or the Department of Agriculture or Seed Commissioner (IN) or State Plant Board (AR) or Commissioner of Agriculture (NC) within such time to permit an inspection of seed, crops or plants (by an Arbitration Committee - AR, ID, MS, SC) in NC, failure to follow this procedure will limit the amount of damages recoverable. Certified copy of complaint must be registered mail to the labeled seller as provided in individual state law. Information about these requirements may be obtained from the state Department of Agriculture.

Ship To
Kevin Heaton
30 South Main St.
Panguitch, UT 84749

From: Granite Seed - Lehi
1697 W 2100 N
Lehi, UT 84043

1-14367

palmer perstemon and Arrowleaf balsamroot

PENSTEMON PALMERI - PALMER PENSTEMON

Lot Number: PEPA - INV115895

Variety Unspecified

Pure Seed: 99.42 %

Other Crop: 0.00 %

Inert Matter: 0.58 %

Weed Seed: 0.00 %

G + D each
Origin
Hard Seed 95.7Z
Date Tested 26-JUN-12
% Hard Seed 99.42
Refracted Weed 0.00
Inert Matter 0.58
Weed Seed 0.00

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RTI



Reforestation
Technologies
International

Basin & High Plains Suite

50% *Glomus intraradices* (UT), 25% *Glomus intraradices* (AZ), 25% *Glomus etunicatum* (NE)

Seeding Rates: 60 lbs. per acre (67.5 kg/ha) 1.4 lbs. per 1,000 ft² (0.7 kg/100 m²). Rate provides approximately 3,600,000 living propagules per acre (8,956,000 propagules/ha).

Hydroseeding: Apply in first pass with seed and a controlled release or organic fertilizer. A second pass with mulch to cover exposed seed and inoculum is recommended.

Seed Drilling: Incorporate into the soil at a depth range at or below the seed.

Broadcast and Till: Evenly distribute across seedbed after seeding. Cover the exposed seed and inoculum by harrowing, chain dragging or applying an organic topdressing. Do not leave inoculum exposed to sunlight for more than four hours.

Row Crop Applications: Side dress seed furrows or transplant at rate of 5 to 8 lbs. per acre (5.61 kg/ha) on 30 inch to 40 inch spaced rows. Rate provides 18 to 28 living propagules per linear foot of row crop (60 to 90 living propagules per meter of row crop). Incorporate at 2 inches to 6 inches (5 to 15 cm) below soil surface.

Nursery Medium: Evenly blend at 5 lbs. per yd³ (3 kg. per m³). 1 lb. (454 grams) contains approximately 60,000 living propagules. Rate provides 300,000 living propagules per yd³ (396,000 living propagules per m³) or 6.5 living propagules per in³.

Caution:

Store under cool dry conditions. Do not expose inoculum to direct sunlight for extended periods of time. Always wear a dust mask when handling.

Statement of Claims: RTI certifies that this product contains one or more species of mycorrhizal fungi at a minimum rate of 50 spores per cubic centimeter. The Mycorrhizal symbiosis is sensitive to environmental conditions and RTI is unable to make any guarantees beyond the above statement.

NON PLANT FOOD INGREDIENT

Batch # **A-15 / A-16 / A-17 / A-18 / L-17 / F-12 / F-21 / F-22 / K-5 / K-11 / K-6 / K-19**

Exp. Date: Oct, 2014

For orders or further technical assistance contact:

Reforestation Technologies International

1341 Dayton St., Unit G

Salinas, CA 93901

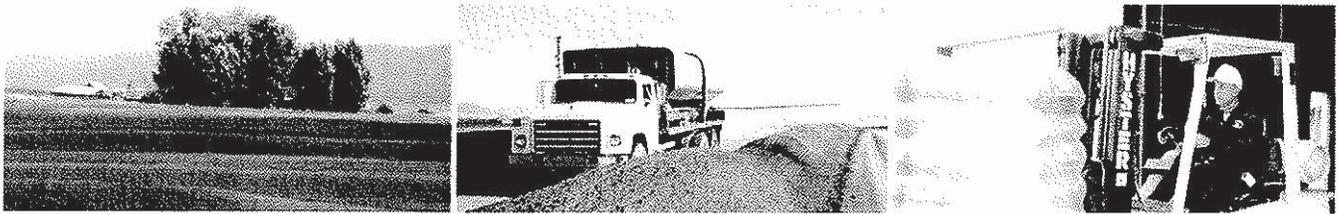
www.reforest.com

e-mail: info@reforest.com

Phone: 1.800.784.4769

Fax: 831.424.1494

Net Weight: 20 lbs (9kg)



Product Overview

Nutri-Mulch® is a natural compost perfected through over 20 years of research and testing. This product provides nutrients which slow release providing longer plant feeding than synthetic fertilizer. In addition, Nutri-Mulch® will loosen tightly bound particles in clay improving root structure, water drainage and air penetration; no need to purchase other products for this purpose. —Wood shavings remain in the compost decompose, which, aided by the abundant, available nitrogen does not compromise plant nutrition.

Nutri-Mulch® is derived from the production of five million turkeys in the Sanpete Valley of Utah by Moroni Feed Company. Used turkey bedding (wood shavings containing their manure) is collected at a central processing facility. This byproduct is placed in long windrows and moistened to an optimal level. The composting process begins and reaches temperatures as high as 150 degrees Fahrenheit. This natural process is accomplished by aerobic bacteria, critical to composting. The result is a weed free compost with no harsh aroma and stellar growing properties.

Composition and Analysis: Nutri-Mulch® is a superior amendment of neutral pH containing soil enriching nutrients in the form of large organic molecules which remain in the soil where they are placed and are bio-available to the plant roots when needed. Guaranteed to have an N:P:K ratio of 1:1:1, Nutri-Mulch® also contains many other micro-nutrients which greatly enhance plant growth and health.

Suggested use:

- Garden and Plant Bed Usage: Apply 1-2" of Nutri-Mulch® to the ground surface and till to a depth of 4-6". Proceed to plant as normal or add sod on the surface.
- Tree & Shrub Planting: Mix Nutri-Mulch® in a 25-35% ratio with backfill soil to be placed around the roots.
- Top Dressing: Spread Nutri-Mulch® ¼" deep over existing sod and water well. Nutri-Mulch® is not recommended as top dressing in flower beds and gardens because it is so fine that the wind blows it away or water will cause it to float away. For this reason it is recommended it be worked into the soil in around plants in existing beds.

Superior results are reported as gardeners use this product as directed. Healthier yards, more robust vegetable and fruit production and decreased water usage are just a few of the benefits reported by Nutri-Mulch® customers. Don't your customers deserve plants and lawns powered by Nutri-Mulch®?

Chemical Composition

Lab number: 22169
 Date: 3/12/2010

(SAMPLE #1)	PERCENT	(SAMPLE #1)	PARTS/MILLION	(SAMPLE #1)	POUNDS OF NUTRIENTS/TON	
N	Nitrogen	2.040	Fe Iron	3208	N Nitrogen	40.8
P	Phosphorus	1.140	Al Aluminum	3200	P Phosphorus	22.8
P2O5	Phosphate	2.610	Mn Manganese	368	P2O5 Phosphate	52.2
K	Potassium	1.540	Cu Copper	247	K Potassium	30.8
K2O	Potash	1.855	Zn Zinc	307	K2O Potash	37.1
S	Sulfur	0.340	B Boron	26	S Sulfur	6.8
Mg	Magnesium	0.660			Mg Magnesium	13.2
Ca	Calcium	3.910			Ca Calcium	78.2
Na	Sodium	0.220			Na Sodium	4.4
					Fe Iron	6.4
					Al Aluminum	6.4
					Mn Manganese	0.7
					Cu Copper	0.5
					Zn Zinc	0.6
					B Boron	<0.1

*Reported on a Dry Basis
 *Moisture = 29.89%
 *Moisture pH = 6.8
 *To convert pounds of nutrients/ton as received,
 multiply pounds of nutrients/ton as reported by (100 - moisture %) / 100

Tests Conducted By:
 ASL Western Agricultural Laboratories
 1311 Woodland Ave #1
 Modesto, CA 95351





Date: 9/26/2012

CLIENT: Alton Coal Development, LLC
Project: Coal Hollow Mine
Lab Order: S1209052

CASE NARRATIVE
Report ID: S1209052001

Samples North Face West Spoils, North of Ditch 4, and South/Top West Spoils were received on September 5, 2012.

Samples were analyzed using the methods outlined in the following references:

- U.S.E.P.A. 600/2-78-054 "Field and Laboratory Methods Applicable to Overburden and Mining Soils", 1978
- American Society of Agronomy, Number 9, Part 2, 1982
- USDA Handbook 60 "Diagnosis and Improvement of Saline and Alkali Soils", 1969
- Wyoming Department of Environmental Quality, Land Quality Division, Guideline No. 1, 1984
- New Mexico Overburden and Soils Inventory and Handling Guideline, March 1987
- State of Utah, Division of Oil, Gas, and Mining: Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, April 1988
- Montana Department of State Lands, Reclamation Division: Soil, Overburden, and Regraded Spoil Guidelines, December 1994
- State of Nevada Modified Sobek Procedure
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.



Soil Analysis Report
Alton Coal Development, LLC

463 North 100 West
Suite 1
Cedar City, UT 84721

Report ID: S1209052001

Project: Coal Hollow Mine

Date Reported: 9/26/2012

Date Received: 9/5/2012

Work Order: S1209052

Lab ID	Sample ID	Nitrate	Phosphorus	Available
		(as N)		Potassium
		ppm	ppm	ppm
S1209052-001	South/Top West Spoils	13.9	9.0	298
S1209052-002	North Face West Spoils	11.5	9.2	299
S1209052-003	North of Ditch 4	7.5	12.9	374

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H2OSol= 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

