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Section 2.05.4(2)(e)

Revegetation

~~SECTION 2.05.4(2)(e)~~

~~REVEGETATION~~

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Section 2.05.4(2)(e)

REVEGETATIONRevegetation

1.0 Introduction

This revegetation plan details the methods and materials required to revegetate and stabilize lands affected by surface mining at the New Horizon 2 area and the amendment area. This revised plan for PR 06 in 2009 incorporates the changes required by the prime farmland soil determination by the NRCS in 2008 and other changes to post-mine uses due to water availability.

2.0 Postmining LandVegetation/Land Use Types

*For the Mid Term Review of 2006, t*The post-mining land uses andpostmine vegetation types have been changed to reflect Rule 1.04. Where existing text refers to the past vegetation studies of Section 2.04.10, these vegetation type names have not been changed. The reclaimed lands have been re-classified according to Rule 1.04 and have new names. A discussion of each post-mining land use/vegetation type is included in this section. Map 2.05.4-5 has been revised to show the new post-mine classifications of land use and vegetation types.

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The postmining land use will be similar to the premining land use - primarily agriculture using irrigation. Irrigated pasture will be the primary postmining vegetation type, but a few areas of dryland pasture on steep slopes or that are out of reach of irrigation sprinklers andin the reclaimed area will consist of the Reclaimed Irrigated Pastureland type, Irrigated Cropland (alfalfa), Dryland Pasture type, and any portions of the Irrigated Pastureland swale/drainage type vegetation adjacent to sediment ponds will also be established. that remain undisturbed or have reestablished naturally during the liability period.

Irrigated pasture ~~was chosen as the primary~~is an important post-mine vegetation type ~~in~~, although dryland pasture is also prevalent. In order to encourage "prompt establishment of vegetative cover and recovery of productivity levels compatible with the approved postmining land use" (4.15.1(2)). ~~-~~, Reclaimed Irrigated ~~pasture~~Pastureland will be established on areas identified ~~as hayland~~ in the ~~baseline vegetation studies, with one exception~~pre-mine studies as Pastureland - Irrigated Grass and Pastureland - Irrigated Hay. The exceptions are the entire Morgan property and a small area on the WFC property, which will be restored to ~~i~~Irrigated ~~c~~Cropland. The various plans for backfilling, grading, and topsoil redistribution (Sections 2.05.4(2)(c) and (d)) will provide the basis for the potential productivity of the reclaimed lands. Upon meeting successful revegetation requirements for the ~~i~~Reclaimed Irrigated ~~pasture~~Pastureland type and release of WFC's liability, these lands may be converted to ~~irrigated hayland~~other uses by the ~~postmine~~ land user or owner. ~~A large portion in the eastern portion of the permit area that is currently in a poor productive state and a portion in the northwestern part of the amendment area will be reclaimed as irrigated pasture. Thus, revegetation activities will return the affected lands to a similar (if currently irrigated and managed) or higher and better use. Successful revegetation of irrigated pasture will show that the reclaimed lands are capable of supporting the uses which they were capable of supporting before mining.~~

Wildlife will continue to make incidental use of the area following reclamation activities. A portion of the swale/drainage type will re-establish naturally adjacent to sediment ponds, continuing to provide habitat to wildlife.

~~Letters were sent to the legal and equitable owners within the permit area, detailing the revegetation plan and proposed postmining land use. Inquiries during 1987 and 1999 baseline studies and discussions with local residents pertaining to Peabody's and WFC's proposed postmining land use, indicated that the proposed postmining land use and establishment of irrigated pasture was compatible with local wishes.~~

~~**Postmining**~~WFC will work with the landowners affected by the changes in the Permit Revision 06. Correspondence with landowners concerning land use changes are included in Attachment 2.05.4(2)(e)-8. The following Table 2.05.4(2)(e)-1 describes the post-mine vegetation and land use category breakdown for the New Horizon #2 Mine.

Table 2.05.4(2)(e)-1

Post-mine Vegetation Types

~~In accordance with Rule 1.04, the postmine vegetation types will consist of the following:~~

~~1) Cropland - irrigated grass hay 22.89 acres~~

~~2) Pastureland - irrigated grass 517.63 acres~~

~~3) Patureland - irrigated swales 5.38 acres~~

~~4) Pastureland - dry 189.63 acres~~

~~5) Rangeland - undisturbed 53.68 acres~~

~~6) Developed Water resource - ponds 6.68 acres~~

~~7) Commercial - roads 11.64 acres~~

~~8) Commercial - facilities 16.03 acres~~

~~Total Permit area = 823.56 acres.~~

~~Much of the previously designated type "Irrigated Hayland" has been re-classified as~~ for Entire Permit Area

IC	IP	IPSW	DP	R-U	P	R	F	Total
107.96	5.02	2.10	28.85	0.80	3.87	5.52	5.75	
3.96	16.03	2.35	20.60	1.08	0.27	12.38	5.38	
	2.87	0.90	2.12	0.12	2.39	0.72		
	3.17		9.49	0.21				
	62.67		1.07	1.22				
	9.24		1.63	2.13				
	35.11		2.00	0.41				
	2.45		1.53	3.18				
	43.53		31.83	16.24				
	51.03		18.72	31.00				
	37.44		26.89	0.96				
	25.62		16.29	5.05				
	12.40		10.64					
			68.26					
			0.03					
			6.25					
			29.73					
			28.98					

IC	IP	IPSW	DP	R-U	P	R	F	Total
111.92	306.58	5.35	304.91	62.40	6.53	18.62	11.13	827.44

This table accounts for the adjusted permit area of 2009 and the various changes to the post-mine land categories. These categories correspond to Map 2.05.4-5 Post-Mine Vegetation/Land Use Map and are further described below.

2.1 Cropland - Irrigated Alfalfa Hay (IC) These areas will have 100% alfalfa (not including the companion crop) which are well-managed, irrigated consistently and harvested. These lands have primarily prime farmland soils, as determined by the NRCS in 2008. See discussion in Section 2.04.3 on Prime Farmlands and Prime Farmland Soils.

2.2 Reclaimed Irrigated Pastureland (IP) These reclaimed areas consist of primarily grasses but can have some alfalfa. This reclamation land use encompasses the pre-mine land use type of Pastureland - Irrigated ~~since it was not consistently baled by the previous owners. One exception to this is a 22.89 acre parcel on the Morgan property which was baled for grass hay with alfalfa prior to mining. This area has been re-designated as Cropland~~Hayland (IPH) and Pastureland - Irrigated Grass ~~Hay (with alfalfa). Morgan historically re-plowed this field from time to time, and the same practice may be employed after reseeding.~~

~~The following discussion on revegetation methods has been split into sections for each major type because of the difference in methods required to establish the irrigated types and dryland pasture type.~~

~~**Revegetation Methods - Cropland Irrigated Grass Hay and Pastureland**~~(IP). The Pastureland - Irrigated Grass ~~and Pastureland~~areas are generally not quite as well managed as Pastureland - Irrigated Hay; they have a lesser percentage of alfalfa, slightly poorer soils and may not yield as much vegetation, but overall, they are similar. The IPH areas were generally baled while the IP areas were generally grazed. In many cases, the field may start out as an IPH field, but over time the alfalfa percentage drops and the field becomes more like a Pastureland - Irrigated Grass field. Both of these pre-mine areas are absorbed into the post-mine use of Reclaimed Irrigated Pastureland (IP). In all cases of discussions of post mine vegetation and land use, Reclaimed Irrigated Pastureland may be referred to as Irrigated Pasture (IP).

2.3 Pastureland - Irrigated Swales (IPSW) These areas are generally low lying areas which drain irrigated fields around them. They are not directly irrigated but usually have substantial water from the surrounding fields. They can have wetland plants and these area are not managed or baled. For post-mine land use success, they are measured in the same manner as Reclaimed Irrigated Pastureland.

2.4 Dryland Pasture (DP) These areas are restored dryland areas that focus toward establishment of adapted dryland grasses, forbs and shrubs, with the intent that these areas will be grazed by livestock animals for their permanent post-mine land use. Much of these areas were either dry pastures or sagebrush rangelands in the pre-mine condition. Some lands that were previously irrigated but do not now have the water needed for irrigation may be converted to Dryland Pasture. There is no sagebrush shrub in the post-mine Dryland Pasture. Two shrubs will be planted from seed for Dryland Pasture tracts west of 2700 Road, which are forage kochia and fourwing saltbush. No shrubs were planted east of 2700 Road.

2.5 Rangeland - Undisturbed (R-U) These areas are natural dry rangeland areas that have not been disturbed. This is a minor portion of the permit area.

2.6 Developed Water Resource - Ponds (P) These areas are mine ponds or restored ponds that will generally be used for stock watering during grazing in or nearby to irrigated pastures or dryland pastures.

2.7 Commercial - Roads (R) This category includes 2700 Road and BB Road through the permit area. 5Th Street Road is also included in this category. These will be removed by mining and rebuilt prior to final bond release of the permit area.

2.8 Commercial Facilities (F) These areas include dwellings, outbuildings, sheds, storage areas, barns, driveways, parking areas, and other miscellaneous related disturbance. All of these areas are related to the post-mining land use of agriculture. A letter from WFC stating that it desires that outbuildings, parking areas, storage areas and other agricultural related areas as shown on Map 2.05.4(2)(e)-5 are to be part of the reclamation plan, is shown in Attachment 2.05.3(3)-8.

In a letter dated January 7, 2007, Jim Boyd of NRCS provided comments and guidance regarding the designation of pre-mine land use and management practices. His letter is attached on the following pages for reference.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
Jim Boyd, Resource Conservationist
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RECEIVED
1-9-08

January 7, 2007

To Whom it May Concern:

I was asked to comment on the Technical Revision No. 55, Section 2.05.4(2)(e) Revegetation for the New Horizon #2 Mine of Western Fuels, Inc. After reading the Revision, the following are my observations and comments intended to clarify what I believe are miscommunications and inaccuracies:

Pages 5 & 6:
It was stated that "irrigated hayland and pastureland are very similar in composition in many cases and may be used interchangeable depending on the operator's needs." This may be true for some fields that are managed for grass or grass/alfalfa hay, and then also grazed by livestock at various times of the year. But there are other instances, quite common, when crop fields are managed solely as hayland, particularly alfalfa hay. This latter condition usually occurs on the better soils, and relies on a high level of management by the operator.

This Revision Document repeatedly uses the terms cropland, hayland, and pastureland almost interchangeably and therefore fails to make the appropriate distinctions between these three agricultural land uses. The following definitions and discussion are intended to clarify these terms and encourage accurate use of them.

Cropland: A broad term used to identify land which produces an agricultural commodity. But for United States Department of Agricultural purposes, it is more specifically used for land that is managed intensively with tillage and other cultural practices to produce commodities such as vegetables, grains, hay, silage, etc. It is considered distinct from pastureland in that periodic re-seeding of a crop is usually necessary to sustain a high level of production. Occasionally, crop aftermath or residue may be grazed after the crop is harvested.

Hayland: A term used to describe land that is used primarily to produce livestock forage that is mechanically harvested and stored for later use. It is considered cropland, and a high level of management (fertilizing, irrigating, pest control, etc.), with periodic re-seeding, is usually necessary to sustain production. As with other cropland, hayland may be grazed at various times of the year depending on the forage grown and the needs of the producer. The common types of hay grown in western Colorado include alfalfa, alfalfa/grass mix, and grass (introduced and/or native species).

Pastureland: Land usually dominated by grasses that is primarily grazed by livestock is considered pastureland. Occasional mechanical harvest may occur at times during the growing season to utilize excess growth. Fields are sustained in permanent grass, or grass/legume mix indefinitely. The level of management is less than hayland, and pasturelands are rarely disturbed with tillage due to poor soil conditions such as shallowness, excessive numbers of rocks, steepness, high water tables, etc.

The important thing to remember is that cropland and hayland are usually established on the better soils; those soils that are deep (at a minimum, three to four feet to bedrock), well drained, reasonably level and on moderate slopes, and containing few rocks. In the San Miguel Soil Survey area, the United States Department of Agriculture has identified soils that meet certain criteria as "Prime Farmland." The following soil map units from the San Miguel Soil Survey are considered Prime Farmland (if irrigated) and may be found in the vicinity of the New Horizon Mine #2:

Map Symbol	Soil Name
1	Abra loam, 1 to 3 percent slopes
2	Abra loam, 3 to 6 percent slopes
14	Barx fine sandy loam, 1 to 3 percent slopes
15	Barx fine sandy loam, 3 to 6 percent slopes

Some producers in the area grow straight alfalfa hay as a cash crop or to feed to their livestock in the winter. The advantage of straight alfalfa hay is that it is very high protein forage for livestock. This is an intensively managed crop and is usually grown on one the above mentioned "Prime Farmland" soils.

Prior to planting alfalfa the soil is well prepared. This will involve tillage, land leveling, rock picking, weed control, fertilizing, etc. In the spring the alfalfa crop is planted, normally with a companion crop of oats, and irrigated well. In the Nucla area, with good management, alfalfa will persist and produce well for seven to ten years, after which production usually declines due to the natural increase of grass and weed competition. It is a common husbandry practice for producers to then plow under the alfalfa and plant small grains (and possibly corn) for a year or two before replanting alfalfa. (Alfalfa produces an autotoxicity that prevents interseeding alfalfa into alfalfa, or following an alfalfa crop immediately with another alfalfa crop, which is why small grains are included in the crop rotation).

The bottom line here is that a clear distinction needs to be made between true "Cropland/Hayland" and "Pastureland." Yes, it is common in the Nucla area for many fields dominated by grass to be hayed in early summer, followed by livestock grazing of regrowth later in the year, so the lines seem to blur. But those fields that are actively managed for hay and/or crop production need to be recognized for their unique value as "Cropland," and preserved, or reclaimed, as such.

Page 7:
A recommended time to seed both dryland and irrigated land in our area is July 15 – Sept. 15, due to the benefit of the monsoonal rains that commonly occur.

3.0 Postmining Land Use

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Land use and baseline vegetation studies (Sections 2.04.3 and 2.04.10) conducted during 1987 and 1999, as well as results from interviews with local operators in the area, show that the pre-mine land use is ~~intensive~~ agriculture based ~~largely~~in part on irrigation. Many of the areas designated as irrigated pasture in the pre-mine vegetation study were abandoned or only partially irrigated. Vegetation types such as the swale/drainage type are present as a result of irrigation in the area and are used, where possible, in a similar fashion to irrigated pasture ~~or irrigated hayland~~. Baseline studies also showed that ~~irrigated hayland and p~~Pastureland Irrigated Hay and Pastureland Irrigated Grass are very similar in composition in many cases and may be used interchangeably depending on the operator's needs. After several years of production following renovation, the hay fields become dominated by grasses and are slowly invaded by species such as Kentucky bluegrass (*Poa pratensis*) and buckhorn plantain (*Plantago lanceolata*). The ~~h~~Pastureland Irrigated Hay fields are used as pasture during various periods in the year based on operator needs. In most cases management is not at a high level. Other than farmsteads, facilities, and a small abandoned orchard, the sagebrush types makes up the balance of the disturbance area. This type reflects disturbance of the original sagebrush type and pinyon-juniper vegetation and the intensity of use from associated agricultural activities. These sagebrush areas are not irrigated and are located on mesa tops where it is impractical to get irrigation water via ditches and on steep mesa sides.

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The postmining land use will be similar to the pre-mining land use - primarily agriculture using irrigation and dryland pasture. These two pasture types will be the highest percentage of any postmining vegetation type. Certain lands, particularly many of those tracts to the north of BB Road and west of 2700 Road, were originally classified to be restored as Reclaimed Irrigated Pastureland, but this was not valid since the water was simply not available to provide proper irrigation on the total area of these lands. For this reason, a portion of these lands have been re-classified as dryland pasture for Permit Revision 06 of 2009-2010.

Permit Revision 06 involves the reclassifying of areas throughout the New Horizon 2 mine area west of 2700 Road. The acreages of post mining land uses have changed significantly. The post mine land use areas were altered due to a reevaluation of water availability. The post mine land use areas now shown in the permit reflect what can be successfully and permanently established on all of the New Horizon 2 mine west of 2700 Road.

The five parcels that have been re-evaluated for the post-mining land use are the 4 separately owned tracts west of 2700 Road and one tract owned by WFC in the extreme southeast corner of the permit area. The four tracts west of 2700 Road are owned by Morgan, Lloyd, Benson and WFC. The tracts east of 2700 Road will not be re-evaluated since they were reclaimed years ago. All of the tracts and the associated water rights available are shown on the revised Map 2.05.4-5 Post Mine Vegetation.

The re-evaluated parcels for the Permit Revision 06 of 2009-2010 are listed below:

1) The parcel of 79.76 acres immediately north of BB Road and west of 2700 Road owned by Benson. This is known as the Benson West parcel.

- This tract was originally classified by Peabody Coal as Irrigated Pasture.
- This tract was "Flood Irrigated" in the past. As described earlier, there were no furrows, gated pipe, side roll sprinkler system or other methods to control water distribution. Irrigation water was allowed to traverse over the land at will.
- Benson has traded coal royalties for land ownership on land (east of 27 Rd) that is currently under Reclamation Bond Liability and is currently planted in Reclaimed Irrigated Pastureland.
- Benson presently owns 44 shares of Colorado Cooperative Company irrigation water. Much of this water has been used to irrigate Benson's acquired lands on the east side of 2700 Road, leaving 12 shares which can be used to irrigate the Benson West property.
- WFC developed a flood irrigation design for the Benson west property. This design can be seen in Attachment 2.05.4(2)(e)-9. It allows for the irrigation of 12.40 acres of Irrigated Pasture (IP) with 12 shares of water. The remaining 55.87 disturbed acres of the Benson west property will be reclaimed as Dryland Pasture (DP). The remaining area of the property consists of 2700 & BB Roads and undisturbed ground.

- The entire site will be graded in a way that will facilitate irrigation across the whole property.

See Map 2.05.4-5 for the location of the irrigated and the dryland pasture portions of this tract. This map also shows the reclaimed surface topography. Additional lands surrounding this 12.40 acre irrigated area can be irrigated in the future if Benson desires to do so. A minimum of 52 acres can be irrigated since the slopes are very mild (approx. 2.5%), which represents the actual surveyed final topography, as seen on Map 2.05.4-5. Since the planned irrigation area (12.40 acres) is at the high point, all lower areas can be easily irrigated if Benson decides to make the water available for this area. The map shows the main pipe that would be used to irrigate the proposed 12.4 acre area. If additional areas are irrigated after bond release, the pipe would be extended to the north or south, as needed.

2) The parcel of 79.74 acres immediately north of BB Road and immediately west of the aforementioned Benson parcel, owned by Lloyd.

- This tract was originally classified by Peabody Coal as Irrigated Pasture.
- The irrigated portions of this tract was "Flood Irrigated" in the past. That is to say, there were no furrows, gated pipe, side roll sprinkler system or other methods to control water distribution. Irrigation water was allowed to traverse over the land at will.
- The Lloyd family owns 24 shares of Colorado Cooperative Company irrigation water and all of it is dedicated to this tract.
- This tract of land has been abandoned from active farming for at least 15 years, according to pre disturbance satellite images and the size and distribution of invasive rose/sage brush and noxious weeds.
- There is no evidence the land was ever developed into a tract suitable to be irrigated by a sprinkler system, but rather a flood irrigation technique was utilized.
- A flood irrigation design was developed by Western Fuels based on accepted NRCS guidance and formulas. This design can be seen in Attachment 2.05.4(2)(e)-9. This design gives a total Irrigated Pasture area of 25.62 acres. The remaining area of disturbance of Lloyd's property will be reclaimed as Dryland Pasture (DP). This is 46.02 acres.

See Map 2.05.4-5 for the location of the irrigated and the dryland pasture portions of this tract. This map also shows the reclaimed surface topography. Additional lands surrounding this 25.62 acre irrigated area can be irrigated in the future if Lloyd desires to do so. A minimum of 62 acres can be irrigated since the slopes are very mild (approx. 4%), which represents the planned final topography, as seen on Map 2.05.4-5. As of May, 2010, most of this area has already been reclaimed to these slopes. Since the planned irrigation area (25.62 acres) is at the high point of the property, all lower areas can be easily irrigated if Lloyd decides to make more water available for this area. The map shows the main pipe that would be used to irrigate the proposed 25.62 acre area. If additional areas are irrigated after bond release, the pipe would be extended to the north or south, as needed.

3) The parcel immediately west of the Lloyd parcel, which is now owned by Western Fuels is a total of 95.89 acres in the permit area. This land was purchased from Johnson.

- This tract was originally classified by Peabody Coal as Irrigated Pasture (IP).
- Portions of these tracts were "Flood Irrigated" in the past. There were no furrows, gated pipe, side roll sprinkler system or other methods to control water distribution. Irrigation water was allowed to traverse over the land at will.
- WFC does not own sufficient water to irrigate this land overall since it has only 12 shares for a total of 95.89 acres.
- Also, most of the 12 shares has been designated by Western Fuels for use on a nearby property outside the permit area and is not available for irrigation on this site.
- An area of 98A soil of 4.76 acres in size on this property was determined to be prime farmland by the NRCS. The construction of Pond 013 disturbed some of this soil (3.96 acres). The prime farmland soil from Pond 013 was excavated in a single lift and stored in a pair of stockpiles near this area. According to CDRMS rules regarding prime farmland, an IC area will be created matching the prime farmland area disturbed as part of the mine's operation. This IC area will be 3.96 acres. Map 2.05.4-8 shows a detail of the area along with an explanation of the post mine land use. The topsoil handling and placement of this area is covered in Section 2.05.4(2)(d).
- WFC will provide water for irrigation of this area based on the ratio used on the Morgan property's flood irrigated fields, which was developed with NRCS and is included in Attachment 2.05.4(2)(e)-7. This ratio is 1.62 acres per share of water of the CC Ditch. WFC will use 2.44 shares of the 12 shares to irrigate this area. The reclaimed area of

Irrigated Cropland (IC) is shown on Map 2.05.4-5. As shown on Map 2.05.4-5, a 4" to 6" HDPE pipe will be used to carry irrigation water to this area from the main pipe near the southern end of the property. A gated pipeline will run along the uphill edge of the field, similar to the Lloyd and Benson fields.

- The portion of prime farmland outside the disturbed area boundary, 0.72 acres, will be left in place and will be adjacent to the reclaimed irrigated cropland. It will receive water from the designated irrigation pipe, but will not be sampled since it is outside the disturbed area.

- WFC is reclassifying the rest of this land as Dryland Pasture (DP). This is 95.89 acres - 3.96 acres = 91.93 acres .

Since this tract did include large portions of irrigated land in the pre-mine condition, WFC plans to restore large portions of the tract so that irrigation could be used in the future if additional water were allocated to the tract. The post-mine topography has been calculated using a detailed balance of the overburden available from the remaining mining, while accounting for the pit void, as well as the large overburden stockpile. These calculations are presented in Section 2.05.4(2)(c). Approximately 54 acres of the WFC property in the permit area could be irrigated in the future after bond release if additional water was available and the landowner decided to use it. This is based on the area where slopes are milder than 6H:1V, as seen on Map 2.05.4-5. Since water would be brought from the main pipe on the high point of the property, all lower areas can be easily irrigated if WFC or a future landowner decides to make more water available for this area.

4) The Morgan property south of BB Road and west of 2700 Road of 107.96 acres that has been designated in the pre-mine discussion (Section 2.04.3) as Irrigated Cropland (IC). As discussed previously, the soils in this area are primarily Barx (98E), therefore, all of the land has been considered prime farmland soils and since the water has been made available for irrigation, all of this tract is considered prime farmlanand will be restored to Irrigated Cropland (IC).

- It has been observed that the Morgan's management style for this field before mining commenced was to flood irrigate the field by gated pipe and furrow strips that ran the length of the field. Typically, the watering would take place at the beginning of each harvest cycle. Massive amounts (up to 70 shares of water or 2 CFS for the eastern 22.89 acre field) were used and needed to traverse portions of the field. This is called "Pulse

Flow Irrigation" and it is needed to **push** the water in the furrows to the furthest point in the field. The aerial photo indicates some of the furrows were in excess of 1,280 feet. It was not uncommon for the water to be turned on for ten days or more to totally cover the acreage. Porosity of the soil also plays a big part in how long a watering set will take and how long a field may be.

- According to recent calculations performed by NRCS (See Attachment 2.05.4(2)(e)-7), 60 shares of water would be needed to irrigate 97.5 acres of Morgan property using sideroll sprinklers. This is based on years of NRCS experience in the area. There are a number of variables that are taken into account when determining this ratio, however, the most important item is the management. This results in a ratio of 1.62 acres per water share in the CC Ditch. Based on this ratio, 66.4 shares would be needed to irrigate the entire Morgan property in the permit area (107.96 acres).
- As of April, 2010, Morgan has leased 62 shares of water (or whatever is necessary) to WFC to irrigate all of their property within the permit area. The lease addendum letter concerning the additional water is included in Attachment 2.05.4(2)(e)-6. Therefore, the entire Morgan-owned area in the permit will be reclaimed as Irrigated Cropland (IC) and all areas within the Morgan property will be considered prime farmland. WFC will replace all topsoil in the entire property to its original depth. See revised Section 2.05.4(2)(d) Topsoil Redistribution. All soils replaced on this property will meet the prime farmland soil specifications outlined in Section 2.05.4(2)(d).

5) The parcel of 29.36 acres in the extreme southeast corner of the permit area, which is now owned by Western Fuels. As of the start of 2008, this parcel has not yet been reclaimed since it contains the overburden main stockpile for the mine.

- This tract was originally classified as Irrigated Pasture (IP) in the pre-mine land use but no water came with the WFC purchase of this tract and none is allocated for future use.
- Portions of the tract were "Flood Irrigated" in the past.
- WFC wants to reclassify this land as Dryland Pastureland (DP) since there is no water available for irrigation.

This 29.36 acre area will be graded to a very mild slope which will be planned for future irrigation, if any future landowner decides to irrigate the property. This slope is expected to be 2% to 4%. This can only be done after the overburden is removed for final reclamation.

All of these changes have been made to Map 2.05.4-5 Post Mine Land Use and Vegetation.

In the version of the Map 2.05.4-5 prior to PR-06, an area of 6.73 acres on the Mel Staats property in the southeast corner of the permit was labeled as “Irrigated Farmland Alfalfa Hayland”. This area was incorrectly labeled on the map since the area was actually reclaimed as Reclaimed Irrigated Pastureland (IP) years ago with the seed mix for this land use type. This area was seeded in the year 1995. In fact, Mel Staats had interactions with WFC over the years and attended the Phase 2 bond release and had no objections to the reclamation of the property.

3.1 Dirk Richards Land Use Change

The former James Martin property is now owned by Dirk Richards. This sale took place in 2004.

This land was primarily irrigated in the pre-mine condition. It has come to WFC’s attention via the Colorado Cooperate Company (CCC) (the local irrigation water provider) that the previous landowner of this parcel, James Martin, sold his remaining fifteen (15) shares of CCC ditch water in May of 1988 to another party. These fifteen shares were used in the past to irrigate a portion of his fifty-four (54) acre parcel of pasture land. There has been no other irrigation water allocated to this parcel since this time according to CCC records . This is includes since 1993, when WFC started operations in the immediate vicinity of the Dirk Richards property. Since there is no water available for this parcel, WFC has elected to reclaim the mine disturbance area on Dirk Richards property back to dryland pasture. This was a land use change from Reclaimed Irrigated Pastureland (IP) to Dryland Pasture (DP), which was approved in Technical Revision 49 in December of 2003. See Map 2.03.4-1 for location of Dirk Richards Property. The land was reclaimed in 2004 and was temporarily irrigated in 2004 and 2005 to give the land a good reclamation start. This is the reason that aerial photos after the reclamation date show an area of irrigated pasture. The land is now fully reclaimed as dryland pasture.

The letter on the following page documents the sale of the water rights.

March 18, 2010

RE: Support information for Technical Revision No 49 (James Martin irrigation water sale)

Amanda Odom, from the Colorado Co-operative Company provided the copy of the purchase/sale of water shares from the James Martin family. She said Mr. & Mrs. James Martin sold their "20 shares" of CCC stock on April 21, 1988 (what is hand written across the document & the hand written "Canceled"). The second page shows they purchased the 20 shares on October 21, 1987.

R.L. Gubka
Chief Engineer
Western Fuels Colorado

CERTIFICATE

FOR

SHARES

OF THE

Capital Stock

of

THE COLORADO
CO-OPERATIVE COMPANY

ISSUED TO

James R. Martin and Mariella Martin
in Joint Tenancy or Survivor

DATED

October 21, 1947

NOTICE. THE SIGNATURE OF THIS ASSIGNMENT MUST CORRESPOND WITH THE NAME AS WRITTEN UPON THE FACE OF THE CERTIFICATE, IN EVERY PARTICULAR, WITHOUT ALTERATION OR ENLARGEMENT OR ANY CHANGE WHATEVER

For Value Received, ... hereby sell, assign and transfer unto .... Shares of the Capital Stock represented by the within Certificate, and do hereby irrevocably constitute and appoint ..... Attorney to transfer the said Shares on the books of the within named Corporation with full power of substitution in the premises.

Dated ..... 19..

In presence of

4.0 - Revegetation Methods - Reclaimed Irrigated Pastureland

The majority of the revegetated areas will be returned to a postmining land use of irrigated pasture including lands within the permit area which have not been disturbed, but which have had irrigation water shut-off in order to better control and manage surface and ground water within the mine area during operations. These latter lands occur in the south and north portion of the proposed permit expansion area. Map 2.05.4-5 shows all Reclaimed Irrigated Pasturelands as well as all other post-mine land uses.

4.1 Topsoil Replacement - General Comments

Topsoil replacement operations may be carried out during most of the year, the exception being those periods when wet conditions would preclude handling of the topsoil materials. Prior to replacement of topsoil, the graded spoil will be ripped to reduce compaction. Detailed topsoil handling and replacement plans are provided in Section 2.05.4(2)(d), Topsoil (Redistribution). The optimum seeding season for establishment of irrigated pasture is during the spring as early as soil moisture conditions allow for tillage and seeding operations. As a result of irrigation, seeding may be carried out as late as July 15. This will allow for a 75-90 day growing season, enough time to establish an adequate stand capable of over-wintering. Fall dormant seedings may be made into annual grain stubble if the potential for competition from established weedy species is not great. ~~For situations where temporary stabilization is required outside of the normal seeding periods, and the stabilization period is less than one year, an annual~~During initial seeding of all reclaimed irrigated pasturelands (IP) with the permanent seed mix, an annual companion grain cover crop of ~~barley or winter wheat will be used, Seed Mix #2.~~ oats or barley will be used at the rate of 25 lbs per acre. This will provide rapid growth so little topsoil is lost to erosion while at the same time providing some nitrogen and organic matter to the soil. This practice will help rejuvenate soils that have been in stockpiles for long periods of time. By implementing this practice, the practice of adding manure to these soils will not be implemented.

At times, the size or shape of the retopsoiled areas and shape of the reclaimed area in relation to a management unit may be insufficient to warrant establishment of the perennial irrigated pasture species initially. When this occurs, and the period before establishment of permanent irrigated pasture will extend beyond a year, Seed Mix #3 - Temporary Reclamation, will be used.

This mix will provide interim stabilization as well as organic matter benefits when incorporated during tillage and seedbed preparation prior to seeding of the irrigated pasture seed mixes.

Prior to final seedbed preparation, soil conditioning and weed control tillage will be carried out through the use of chisel plowing and disking. Chisel plowing will relieve any topsoil compaction, will aid in controlling weedy species, and will leave the site in a temporary toughened condition reducing wind and water erosion potential. Disking will be used to condition soil, break up clods, and control weeds through tillage prior to seeding. If annual weeds are a problem, several tillage operations may be required to get adequate control. Harrowing and cultipacking prior to seeding will be conducted as needed in order to provide the smooth, firm seedbed required. In any areas that may be poorly drained, tillage will be timed in order to reduce bogging, excessive compaction and excessive cloddiness caused by tillage when soils are wet. The best period for tillage in these areas may be in the early spring prior to the irrigation season (prior to mid-April). Section 2.05.4(2)(d), Topsoil (Redistribution), contains additional information on subsoil and topsoil conditioning.

~~Seeding will be done either with a cultipacker type seeder or a drill equipped with double-disk openers, depth bands, and packer wheels. A cultipacker may be used behind the drill to also firm the seedbed. Either of these two types of seeding equipment will provide the greatest level of success in terms of proper seed placement and firming of the soil around the seed. Seeding depths are usually about 1/4 inch deep for the species to be seeded, and never more than ½ inch deep. Seeding will primarily be done using the alternate row method where all grasses are seeded in every other row and the legume is seeded in the remaining rows. This method decreases competition, especially for species such as birdsfoot trefoil which can be somewhat difficult to establish and are poor competitors in the seedling stage. This method is an accepted method for establishing good pasture and will assure the desired proportion of grass and legume species over the life of the pasture. If it is determined that the drill seeding method is not desirable for a particular area, then a broadcast seeder will be utilized to distribute the grass seed onto the surface of the ground. A large tractor mounted broadcaster having the capacity of holding several bushels of grass seed will be used and the tractor will traverse the field such that overlapping of the seed will occur. After the seed is broadcasted, a spring tooth harrow will be drug over the field to bury the seed approximately 1/4 inch. Since not all of the seed will be covered, the seed rate will be increased 50% over the drilled seed rate. If the harrow is not utilized, such as in a topsoil stockpile situation, then the broadcast rate will be double the drilled rate.~~

No mulch is to be applied on lands reclaimed to irrigated land use. This would only provide additional opportunities for establishment of competing annual and perennial weedy species and volunteer grain that would negatively impact the stand. The use of irrigation will establish an effective vegetative cover in a relatively short time after seeding. ~~C~~As described earlier in Section 4.0.1Is this section number correct? Should it be 2.04.01?, companion crops of annual grains will also ~~not~~ be used during ~~stand establishment. While some erosion and weed control benefits might be gained, the potential for reduced stand establishment and density is real. A companion crop's greatest importance (or advantage) has been in providing a cash crop to the operator during the first season following pasture seeding. The cover crop, mentioned earlier as a means of temporary stabilization, is not a companion crop.~~

~~Fertilization will be carried out based on the results of soil tests taken in replaced topsoil and recommended rates for stand maintenance and achieving the various production levels desired. Nitrogen is not essential to the establishment of new pasture areas if adequate soil levels exist, higher heavy initial rates may be detrimental to stand establishment. If soils show a low nitrogen fertility, an application of 30-60 pounds/acre of available nitrogen should be adequate for establishment (Ensign 1975). Phosphorus is beneficial both to the establishment of new seedlings and the established legume component. Phosphorus rates will be determined on the basis of the soil test.~~

~~Initial applications, made prior to seeding, will be incorporated. Annual applications of fertilizer will be carried out and will be based on soil tests and achieving the desired production goals.~~

~~Two irrigated pasture mixes and one irrigated alfalfa hayland mix have been developed in order to establish the irrigated pasture or hayland types on the range of site conditions that may be encountered in the areas to be reclaimed. Seed Mix #5 has been developed for upland, well-drained sites for irrigated pasture, while Seed Mix #6 has been developed for lowland areas or other areas that may be poorly drained (swales). Seed Mix #7 is for the cropland - irrigated grass hay with alfalfa mix. The irrigated pasture mix has a fair range of adaptability for drier or wetter sites that may develop in the principal areas where the mix is used.~~

~~**Seed Mix #1 - was an old Peabody mix for dryland areas that has been eliminated for the New Horizon #2 Mine.**~~

Seed Mix #2 - Temporary Reclamation - less than one year of cover, reclaimed land waiting for permanent planting

SpeciesCommon Name	Seeding Rate
1. Barley*	70 lbs/acre
2. Winter Wheat *	70 lbs/acre
3. Oats*	70 lbs/acre

*Note: One species will be used at a time and at the specified rate. Specie selection will be based upon land owner preference and availability of seed.

Seed Mix #3 - Topsoil Stockpiles, Temporary Reclamation, longer than one year, Temporary Diversions, Road Right-of Ways

Species	Scientific Name	Common Name	PLS/Acre*
1.	Agropyron trachycaulum	Slender wheatgrass	8
2.	Agropyron desertorum	Desert wheatgrass	4
3.	Agropyron smithii	Western wheatgrass	8
4.	Dactylis glomerata	Orchardgrass	1.5
5.	Poa compressa	Canada bluegrass	1
Total			**22.5**

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Recommended varieties: See Peabody Tab 22 Seed Mix No. 1 and No. 2.

Site Variations Adaptability of Seed Mix #3:

Dry Sites:	Agropyron, Poa, Dactylis
Moist Sites:	Agropyron smithii, Dactylis
Cool Season:	Agropyron, Poa, Dactylis
Fine Textured Soils:	Agropyron smithii, Agropyron desertorum, Poa, Dactylis

Coarse Textured Soils: Agropyron dasystachyum, Poa, Dactylis.

Comments: Rhizomatous species include:Agropyron smithii, Agropyron dasystachyum. Early spring growth species include: Agropyron desertorum and Poa compressa.

Seed Mix #5 - Pastureland Irrigated Grass Mix, Upland - Well - drained Sites

Species		Drill Rate lbs.
Scientific Name	**Common Name**	**PLS/Acre***
1. Bromus biebersteinii	Meadow brome	6
2. Dactylis glomerata	Orchardgrass	2
3. Medcago Sativa	Alfalfa	2
		10

Note: Alfalfa seed must be inoculated with a specific strain of Rhizobium bacteria.

Seed Mix #5 - Recommended Varieties

Meadow brome - Regar

Orchardgrass - Latar

Alfalfa - Lahonton (AV120, Nomad, Ranger, Lodak, or other recommended flemish variety)*

*Cultivars in parenthesis may be selected as alternates.

Seed Mix #6 - Pastureland Irrigated Swales Mix, Poorly - Drained Sites

Species		Drilled Rate lbs.
Scientific Name	**Common Name**	**PLS/Acres***
1. Alopecurus arundinaceus	Creeping foxtail	2
2. Lotus corniculatus	Birdsfoot trefoil	2
3. Trifolium hybridium	Alsike Clover	2
4. Agrostis alba	Red Top Grass*	2
5. Phleum pratense	Timothy	2
		10

Note: Birdsfoot trefoil seed must be inoculated with a specific strain of Rhizobium bacteria.

Seed Mix #6 - Recommended Varieties

Creeping foxtail - Garrison

Birdsfoot trefoil - Empire (tretana, Carroll, Mackinaw)*

* For extreme saturated soils: Substitute Reed Canarygrass (Phalaris arundinacea) for Red Top Grass and Rabbitfoot Grass (Polypogon nonspeliensis) for Timothy. Same seed rate.

Seed Mix #7 - Cropland - Irrigated Grass Hay with Alfalfa Mix

Species		Drilled Rate lbs.
Scientific Name	**Common Name**	**PLS/Acres***
1. Medicago sativa	Alfalfa	12
2. Dactylis glomerata	Orchardgrass	8
3. Bromus brebersteinii	Meadow Brome	7
		27

Note: Alfalfa seed must be inoculated with a specific strain of Rhizobium bacteria. 70 lbs/acre of oats should also be planted as a first year cover crop when planting this mixture.

Seed Mix #7 - Recommended Varieties

Alfalfa - Lahontan (Vernal, Ladak 65, Dawson or other recommended flemish varieties)*

Orchardgrass - Latar

initial permanent mix seeding to lessen the possibility of erosion, provide nitrogen and organic matter to the soils.

4.2 Irrigation Designs

Areas that are to be returned as Reclaimed Irrigated Pastureland will be irrigated using either sprinkler irrigation or flood irrigation. Map 2.05.4-5 shows all irrigation layouts for the areas west of 2700 Road. All Reclaimed Irrigated Pastureland fields west of 2700 Road will be flood irrigated, but a sideroll sprinkler design for the Benson East property was included as part of determining the amount of water available for Benson West (west of 2700 Road).

All calculations for both flood and sideroll sprinkler irrigation are shown in Attachment 2.05.4(2)(e)-9 for the Reclaimed Irrigated Pastureland reclaimed areas. These calculations were done using irrigation design worksheets from the Colorado Irrigation Guide and National Engineering Handbook Sec. 15, Chap. 11. Flood irrigation will be supplied by 4 inch to 10 inch supply lines. The Lloyd and Benson West properties will have some portions of Reclaimed Irrigated Pastureland, based on the amount of shares that are available for each landowner.

Benson has 12 shares available for the Benson West property, out of the 44 shares total that he owns. The other shares are committed to two other Benson parcels that are in Reclaimed Irrigated Pastureland east of 2700 Road (Benson South and Benson East). The designs are based on the NRCS calculations with accounting for 6 days out of 7 days for operating the system, allowing one day off for rest, unforeseen issues, system maintenance, family commitments, etc. This design can be seen in Attachment 2.05.4(2)(e)-9. According to the design worksheets, the Benson West property will be flood irrigated at a rate of 0.97 shares/acre to cover an area of 12.40 acres from 12 shares.

Lloyd has 24 shares available for Reclaimed Irrigated Pastureland on his property. The designs are based on the NRCS calculations with accounting for 6 days out of 7 days for operating the system, allowing one day off for rest, unforeseen issues, system maintenance, family commitments, etc. This design can be seen in Attachment 2.05.4(2)(e)-9. According to the design worksheets, the Lloyd property will be flood irrigated with a total of 24 shares spread over 25.62 acre. This is a flood irrigation flow of 0.94 shares/acre.

4.3 Seed Mix Information

Seed Mixes #5 and #6 are the Reclaimed Irrigated Pastureland seed mixes depending on whether the site is well drained or poorly drained. All species contained in Seed Mixes #5, #6 and #76 are introduced. The introduced species support the proposed post-mining land use, and the referenced literature and individuals (presented in the following paragraph) support the fact that these species are desirable and necessary to achieve the post-mining land use.

Species selection for the irrigated pasture mixes was based on these items: (1) irrigated pasture mixtures should be simple, with one to two grasses and a legume; (2) the legume should be a persistent, adapted, non-bloating species; and (3) the grass component should be palatable, nutritious, persistent and compatible in the stand. Alfalfa, the desirable legume for Seed Mix #5, is selected for its long history of production and longevity in the local area. Dean Stindt, Soil Conservation Service local Extension Agent (now with the Bureau of Land Management, Norwood Office), recommended varieties shown in Seed Mix #5. Birdsfoot trefoil, selected as the legume for Seed Mix #6, is a long-lived perennial forage legume that is non-bloating, winter hardy, and adapted to a range of site conditions including poorly drained sites. Though a slow starter, once established it is persistent in the stand, particularly if seeded in alternate rows. The seed must be inoculated with a specific strain of Rhizobium bacteria. Other coal companies have used meadow brome in their operations (specifically, Peabody's Big Sky Mine in Montana). The use of meadow brome is supported by the enthusiastic recommendation of its use in irrigated pastures by the Colorado State University Experiment Station and Cooperative Extension Service. Meadow brome is highly palatable but persists well in irrigated pastures and has nutrient qualities at least as high as smooth brome. Orchardgrass has been a common and proven component in irrigated pastures for years because of its palatability, nutrient qualities, compatibility with legumes and other grasses, and productive ability. Creeping foxtail remain the best adapted desirable pasture grasses for poorly drained or wet conditions. Garrison creeping foxtail is a good producer once established, being both highly palatable and nutritious.

The species in Seed Mix #5 will function equally well for establishing the ~~grass hayland~~irrigated pasture type. Grasses are dominant in the mix and the resulting stand will also be dominated by grasses. See Mix #6 has Alsike Clover, Redtop and Timothy grasses. Alsike Clover is a nitrogen fixing legume that is suited to irrigated, wet conditions. Redtop and timothy are rated "high" for cow, horse and elk feed preference. Feed preference has palatability, nutrition, total digestible nutrients and other factors involve. In other words, livestock will readily go to Redtop and Timothy

grasses for feed. Local ranchers and farmers are accustom to, have used and prefer theses grasses. They are also suited to irrigated conditions. ~~The recommended alfalfa varieties have done well in the region (T. Doherty, personal communication, April 1988). Latar orchardgrass is a very compatible grass when used in an alfalfa-grass hayland stand. Latar orchardgrass is productive, has very good nutritive qualities, and reaches the most desirable harvest stage at the same time as alfalfa (Hafenrichter et al. 1979 and Heath et al. 1985).~~

~~Upon completion of the seeding operations, lands that are to be returned as irrigated pasture will be irrigated using sprinkler irrigation. The irrigation design and application rates will be submitted to CDMG for concurrence.~~

~~Maintenance activities will include the normal monitoring for and repair of excessive rilling or gulling, weed and pest control, and any necessary reseeding. The rill and gully management and stabilization plan is detailed at the end of this section. Weed and pest control management will be conducted as necessary and in accordance with the plan described at the end of this section.~~

~~Management activities will center on proper irrigation water management, fertilization, and grazing or harvest management. Irrigation will be accomplished with side roll sprinklers and water cannons supplied by 12 inch and 6 inch supply lines. Water will be applied at a rate of 2 inches per week. Fertilization requirements will be based on the results of periodic soils tests and NRCS or Extension Service recommended normal application rates, with the rates directed towards maintaining vigor and the required production level of the stand during the bond liability period. Split applications will be considered for maximum effectiveness of the fertilizer applications. Grazing of the established irrigated pastures will not be considered during the first season in order to reduce trampling and pulling of the plants by livestock. Harvesting (mechanical) will be used to remove any significant growth during the first season. After the first season, and depending on the size of the management unit~~

Temporary reclamation may employ seed mixes #2 and #3 as shown below. These mixes may be used for temporary sites regardless of the post-mine use.

Seed Mix #2 - Temporary Reclamation - less than one year of cover, reclaimed land waiting for permanent planting

SpeciesCommon Name	Seeding Rate
1. Barley*	70 lbs/acre
2. Winter Wheat *	70 lbs/acre
3. Oats*	70 lbs/acre

*Note: One species will be used at a time and at the specified rate. Species selection will be based upon land owner preference and availability of ~~additional management units, grazing may be implemented. Harvesting will continue to be considered as a management option if grazing is not implemented in any given year. Harvested hay will be removed from the fields as rapidly as hay quality and weather conditions permit.~~

~~Revegetation Methods - Pastureland - Dry~~

~~The dryland pasture type will be established in areas which were previously sagebrush rangeland on the 1987 Travessitta-Pinon soils and on 1999 soil map units 98B, 98C, and 98H (see Map 2.04.9-1).~~

~~Seed Mix #8 has been developed to provide a mix of species that are compatible with the adjacent irrigated pasture type, has a high level of utility, and will provide long term protection of the resource.~~

~~The above varieties are preferred but do not constitute the only available adapted varieties. Seed availability problems associated with the above recommended~~seed.

Seed Mix #3 - Topsoil Stockpiles, Temporary Reclamation, longer than one year, Temporary Diversions, Road Right-of Ways

Species Scientific Name	Common Name	PLS/Acre*
1. Agropyron trachycaulum	Slender wheatgrass	8
2. Agropyron desertorum	Desert wheatgrass	4

3. Agropyron smithii	Western wheatgrass		8
4. Dactylis glomerata	Orchardgrass		1.5
5. Poa compressa	Canada bluegrass		1
Total			**22.5**

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*Note: ~~D~~The PLS/Acre shown above are drilled rate~~ is half of thes~~. If broadcast ~~species rate~~seeding is used the PLS/Acre will be doubled. Topsoil stockpiles are nearly always broadcast seeded because of steep slopes, general stockpile configuration and smallness of the area.

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Recommended varieties~~ will require that the next best adapted variety or native/common types be used. The alternate selections will be made from regional sources.~~

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~~All species are introduced, however these are the best available species for the post mine land use and are necessary and desirable to achieve the intended use.~~

Seed Mix #8 - Dryland Pasture

Species	Cultivar	Drilled Rate lbs.of PLS/Acre**
Fairway Crested Wheatgrass	Ephriam	0.8
Pubescent Wheatgrass	Luna	2.3
Russian Wildrye	Bozoisky	1.3
*RS Wheatgrass	Newhy	0.8
Alfalfa	Spreador 2	0.5
		5.7

*If RS Wheatgrass is not available, increase Pubescent Wheatgrass by 1.0 pound/acres.

**Broadcast rate is double the drilled rate

Site Variation: See Peabody, Tab 22 Seed Mix No. 1 and No. 2

Site Variations Adaptability of Seed Mix **8** #3:

Dry Sites:	All species. Agropyron, Poa, Dactylis
Moist Sites:	Agropyron hybridsmithii, Medicago. Dactylis
Cool Season:	Agropyron, Elyrnus,.
Warm Season:	Medicago.Poa, Dactylis
Fine Textured SitesSoils:	Agropyron hybridsmithii, ElyrnusAgropyron desertorum, Medicago.Poa, Dactylis
Coarse Textured Sites:	All species except Medicago.

Revegetation methods, includingSoils: Agropyron dasystachyum, Poa, Dactylis.

Comments: Rhizomatous species include:Agropyron smithii, Agropyron dasystachyum. Early spring growth species include: Agropyron desertorum and Poa compressa.

Seed Mix #5 - Reclaimed Irrigated Pastureland Well - drained Sites

Species Scientific Name	Common Name	Drill Rate lbs. PLS/Acre*
1. Bromus biebersteinii	Meadow brome	6
2. Dactylis glomerata	Orchardgrass	2
3. Medcago Sativa	Alfalfa	2
		10

Note: Alfalfa seed must be inoculated with a specific strain of Rhizobium bacteria.

Seed Mix #5 - Recommended Varieties

Meadow brome - Regar

Orchardgrass - Latar

Alfalfa - Lahonton (AV120, Nomad, Ranger, Lodak, or other recommended flemish variety)*

*Cultivars in parenthesis may be selected as alternates.

Seed Mix #6 - Reclaimed Irrigated Pastureland, Poorly - Drained Sites

Species Scientific Name	Common Name	Drilled Rate lbs. PLS/Acres*
1. Alopecurus arundinaceus	Creeping foxtail	2
2. Lotus corniculatus	Birdsfoot trefoil	2
3. Trifolium hybridium	Alsike Clover	2
4. Agrostis alba	Red Top Grass*	2
5. Phleum pratense	Timothy	2
		10

Note: Birdsfoot trefoil seed must be inoculated with a specific strain of Rhizobium bacteria.

Seed Mix #6 - Recommended Varieties

Creeping foxtail - Garrison

Birdsfoot trefoil - Empire (tretana, Carroll, Mackinaw)*

* For extreme saturated soils: Substitute Reed Canarygrass (Phalaris arundinacea) for Red Top Grass and Rabbitfoot Grass (Polypogon nonspeliensis) for Timothy. Same seed rate.

4.4. Seeding Procedures - Reclaimed Irrigated Pastureland

The optimum seeding season for establishment of irrigated pasture is during the spring as early as soil moisture conditions allow for tillage and seeding operations. As a result of irrigation, seeding may be carried out as late as June 15. This will allow for a 100-120 day growing season, enough time to establish an adequate stand capable of over-wintering. During initial seeding of all reclaimed irrigated pasturelands (IP) with the permanent seed mix, an annual companion grain cover crop of oats or barley will be used at the rate of 40 lbs per acre. This will provide rapid growth so little topsoil is lost to erosion while at the same time providing some nitrogen and organic matter to the soil. This practice will help rejuvenate soils that have been in stockpiles for long periods of time. By implementing this practice, the practice of adding manure to these soils will not be implemented.

At times, the size or shape of the retopsoiled areas and shape of the reclaimed area in relation to a management unit may be insufficient to warrant establishment of the perennial irrigated pasture species initially. When this occurs, and the period before establishment of permanent irrigated pasture will extend beyond a year, Seed Mix #3 - Temporary Reclamation, will be used. This mix will provide interim stabilization as well as organic matter benefits when incorporated during tillage and seedbed preparation ~~and seeding, are similar to that presented earlier in the revegetation plan discussion for the New Horizon Mine. Exceptions include the possible use of the grass drill specified in~~prior to seeding of the irrigated pasture ~~revegetation discussion in lieu of the rangeland type drill and the use of cover crop for surface stabilization only on steeper slopes. No mulching is planned for these small areas, however, a cover crop will be seeded as a surface stabilization measure. Management and maintenance activities will include any necessary repair of rills or gullies (detailed at the end of this section), reseeding, or grazing management. Grazing management will be centered on the proper use by livestock of the dryland pasture areas in relation to the associated irrigated pasture. Dryland pasture will only receive an initial fertilizer application at the time of seeding.~~

Additional Revegetation Measures

WFC does anticipate volunteer willows to grow in low lying swales and drainage channels adjacent to sediment ponds. Shrubs will also advance into the reclaimed areas over time, which is normal for the western slope of Colorado.

Table 2.05.4(2)(e)-1 represents the estimated acreage of the various reclaimed land use/vegetation types to be established within the New Horizon 2 Mine area for reclamation under Rule 1.04. These designations and acreages have been modified for the 2006 Mid Term Review. Map 2.05.4-5 shows where the various post-mine vegetation types will occur. Map 2.05.4-4 shows the replacement depths of topsoil in the disturbed area.

TABLE 2.05.4(2)(e)-1

Reclaimed Areas by Type

Area IP DP R-U P IPSW F ICG RWEST38.9714.073.0422.8937.6482.6215.3145.0915.8542.2538.86EAST45.65 2 0 . 7 1 3 1 . 0 1 3 . 8 6 2 . 3 6 1 6 . 0 3 11.6402.122.272.562.1209.561.070.260.95.213.20.9862.751.8135.1331.489.2419.3651.022.8337.841.872.452.8643.643.18Total823.56517.63189.6353.686.685.3816.0322.8911.64

Legend

IP = IRRIGATED PASTURE - GRASS

DP = DRYLAND PASTURE

R-U = RANGELAND UNDISTURBED

P = DEVELOPED WATER RESOURCE - PONDS

IPSW = IRRIGATED PASTURE - SWALES

F = COMMERCIAL FACILITIES

ICG = IRRIGATED CROPLAND - GRASS HAY

R = COMMERCIAL USE - ROADS

~~**Cropland - Irrigated Grass with Alfalfa Type (ICG)** This type was previously called irrigated hayland. One area of irrigated hayland will be established on reclaimed land on the amended area (Morgan property) within the New Horizon permit area. This area occurs in the southwestern portion of the permit area (NE1/4, NE1/4, Sec. 1, T.46N., R.16W.). The area will be reclaimed to a grass dominated irrigated cropland although alfalfa is part of the seed mix. (seed mix #7) as detailed earlier.~~

~~As can be seen in Table 2.05.4(2)(e)-2, there is a wide variation in the number of hay cuttings the local Nucla farmers get~~seed mixes.

Seeding will be done either with a cultipacker type seeder or a drill equipped with double-disk openers, depth bands, and packer wheels. A cultipacker may be used behind the drill to also firm the seedbed. Either of these two types of seeding equipment will provide the greatest level of success in terms of proper seed placement and firming of the soil around the seed. Seeding depths are usually about 1/4 inch deep for the species to be seeded, and never more than ½ inch deep. If it is determined that the drill seeding method is not desirable for a particular area, then a broadcast seeder will be utilized to distribute the grass seed onto the surface of the ground. A large tractor mounted broadcaster having the capacity of holding several bushels of grass seed will be used and the tractor will traverse the field such that overlapping of the seed will occur. After the seed is broadcasted, a spring tooth harrow will be drug over the field to bury the seed approximately 1/4 inch. Since not all of the seed will be covered, the seed rate will be increased 100% over the drilled seed rate. If the harrow is not utilized, such as in a topsoil stockpile situation, then the broadcast rate will be double the drilled rate.

Inter-seeding of Reclaimed Irrigated Pastureland (IP), may occur throughout the bond release period, as this is a normal husbandry practice. See letter on the following page from Jim Boyd, the local NRCS specialist, which substantiates this practice. Western Fuels may employ these practices during the reclamation period.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
Jim Boyd, Resource Conservationist
P. O. Box 29
Norwood, CO 81423

jim.boyd@co.usda.gov
970-327-4245-OFFICE
970-327-4247-FAX

October 17, 2007

To Whom it May Concern:

It is a common agricultural practice to "interseed" legumes into existing irrigated pastureland or hayland to increase the production and protein content of the pasture or hay, and to improve the nitrogen fertility of the soil. Interseeding means that the seed is applied to the existing field using either a drill or by broadcast application, without any mechanical soil preparation conducted prior to seeding. Interseeding of legumes usually occurs when the pastureland or hayland is dominated by grasses, and the producer wants the benefits of a grass/legume mix and/or more production.

Another advantage of the interseeding of legumes into existing grass pastures or hayland, is that broadleaf herbicides can be used to control broadleaf weeds in the grass stands for a few years, before interseeding the legumes, which are susceptible to the aforementioned herbicides.

It is less common to interseed grasses into existing pasture or hayland, unless the initial germination and establishment is poor and further tillage operations are deemed unnecessary. Seedbed preparation is expensive, and furthermore, it dries out the soil and brings new weed seeds to the soil surface; so if the initial seeding is spotty and there is a lot of bare ground, then an interseeding of grasses and/or legumes may be effective. Interseeding grasses into a grass stand tends to be less effective than interseeding legumes into a grass stand, but successes of the former are not unheard of.

If you have questions or would like to discuss this topic further please contact me.

Sincerely,

Jim Boyd

Jim Boyd, NRCS Resource Conservationist

4.5 Reclaimed Irrigated Pastureland Revegetation Success Criteria and Success Demonstration

The revegetation success standards for this type are based on the establishment of Reclaimed Irrigated Pastureland as the postmining land use. Reclaimed Irrigated Pastureland should be able to attain a good level of productivity with only one to two grasses and a legume under continuing and adequate management inputs. This includes scheduled irrigation, annual fertilization based on soils tests and plant needs, and grazing management or proper harvest methods. Annual fertilization of Reclaimed Irrigated Pasturelands is part of the normal husbandry applied to maintain vigor and productivity. The requirements for establishment of woody plant densities, species diversity, and seasonal variety are irrelevant to the Reclaimed Irrigated Pastureland vegetation type and postmining land use. Therefore, the standards of revegetation success for the Reclaimed Irrigated Pastureland type will be based on production and "live cover".

As can be seen in Table 2.05.4(2)(e)-2, all local farmers harvest their irrigated fields at least one time during the year. ~~Everyone gets one cutting and t~~There are a few farmers that attempt a second and third cutting~~. T~~ but the majority of the production comes from the 1st cutting ~~however~~. The success standard for WFC~~'~~'s ~~i~~Reclaimed Irrigated ~~cropland will be based upon 1st cutting production only so our yield can be easily compared with the local farmers. WFC has personally contacted three of the larger farms (Mel Staats, Frank Morgan and Zene Weimer) that surround NH2 for their first cutting production figures in irrigated cropland fields (See Attachment 2.05.4(2)(e)-A). They gladly gave us their estimates based upon a lifetime of experience. All these men have approximately 40+ years apiece of farming experience in the Nucla area and their knowledge of first cutting crop yield for irrigated cropland in the Nucla area is priceless. They gave WFC yields they personally achieved and were representative over many drought-wet harvest seasons. WFC has submitted the yields presented to us by the farmers in Attachment 2.05.4(2)(e)-A to the local NRCS office for their review. WFC will use the average 1st cutting yield from these three farmers for our~~Pastureland will involve statistically adequate sampling based comparison to the approved reference area. The sampling will be conducted a single time during late May-early June (immediately prior to 1st cut harvest of the reclaimed fields; with reference and reclaimed areas to be sampled within a 7 day time frame.) *It needs to be emphasized that these measurements were accurately measured by Peabody in 1987 for fields that contained alfalfa hay and the yield was only 0.82 tons per acre.*

Prior to TR-58 of 2008, the production standard~~. A 1st cutting production of 1.84 tons per acre will be the target yield at New Horizon Mine. During the 1999 baseline vegetation survey (Sec. 2.04.10) the average yield for all pastures was 2.00 tons/acre. The yield ranged from a high of 4.26 tons/acre for highly managed alfalfa to a low of .57 tons/acre for unirrigated grassland. 1999 was a very wet year in western Colorado (177% of normal for 1999 to date, NRCS San Miguel Basin Precipitation Data) and could explain the slight increase in overall production (2.00 tons/acre vs 1.84 tons/acre). Therefore, the 1.84 tons/acre is a the standard to apply to this cropland. We are currently evaluating the past Peabody records of production in 1987, the landowner statements, soil and aspect data as well as NRCS data to confirm if the standards for irrigated cropland are appropriate. As shown in Table 2.05.4(2)(e)-2, the yields for 1st cutting average 1639 lbs per acre or 0.82~~ for Reclaimed Irrigated Pastureland was 1.50 tons per acre.

~~***TABLE 2.05.4(2)(e)-2***~~

~~*WEIGHT AVERAGE OF ANNUAL PRODUCTION FOR IRRIGATED CROPLAND (PREVIOUS HAYLAND) TYPE, NEW HORIZON 2 STUDY AREA 1987*~~

~~*Text Was Moved From Here: 4*~~

~~*YEARLY PRODUCTION (pounds per acre) 2,403 (use 2,400 lb/ac)*~~

~~*Herbaceous production will be measured at reclaimed sites. Statistical comparisons of mean production between the reclaimed areas and the reference standard will be used to determine revegetation success, as described below. Herbaceous production will be measured as current year above-ground biomass of herbaceous vegetation, as defined by CDMG Regulation 4.15.8(4).*~~

~~*Vegetation sampling for measuring reclamation success will be conducted to ensure a repeatable and unbiased estimate of herbaceous production. Measurements will be made at a time during the May through September growing season. Herbaceous production will be measured by either 1) a quadrat sampling method that meets the provisions of CDMG Regulation 4.15.11(1)(b)(I), or 2) a total harvest measurement method.*~~

~~*Quadrat sampling method: The observational unit will be a rectangular or circular plot frame at least ¼ square meter and large enough to encompass individual plants of the larger species being sampled. Sampling points for herbaceous production will be located by using a random number generating procedure to create up to 50 random coordinate pairs within each reclaimed site. A geographic positioning system (GPS) unit will be used to navigate to the sample points, in the order that the points were randomly generated. The sampling frame will be thrown over the shoulder to determine the exact sample location. Current year growth of herbaceous non-woody species will be clipped within each quadrat. The sampled plant material will be bagged, taken to a laboratory, and dried and weighed. Samples will be oven-dried at 105 degrees C to a constant weight. Weights will be divided by the area of the sampling frame, then multiplied by the ratio of the frame area to 1 acre, to determine dry weight per acre.*~~

~~*Harvest measurement method: This method is consistent with the method used in 1987 at the NH 2 site to determine baseline production. Upon completion of a first cutting in a field, the number of bales cut from the field will be counted. A sample of at least 15 bales will be arbitrarily selected and weighed with a portable field scale accurate to 1 pound. Care will be taken to select bales from throughout the field, or if the hay is already stacked, from many locations in the stack. At the time of weighing, a small sub-sample of hay will be collected from each bale, bagged, labeled, and weighed in the field with a Pesola scale. In the laboratory, the sub-samples will be oven dried at 105 degrees C to a constant weight, then re-weighed to determine a fresh weight to dry weight correction factor. Fresh bale weights will be multiplied by the mean correction factor to estimate bale dry weights, and the mean bale dry weight for the field calculated. Herbaceous production*~~

~~*on a dry weight basis for the field will be estimated by multiplying the number of bales counted by the mean bale dry weight, and dividing by the number of acres in the field.*~~

~~*For either method, revegetation will be deemed adequate if herbaceous production at the reclaimed site is equal to or greater than the standard of 1.84 tons per acre in at least 2 of 4 years, in conformance with CDMG Regulation 4.15.9. If the harvest measurement method is used, statistical comparison of the estimated production with the reference standard is not appropriate, and mean production at the reclaimed site must equal of exceed the reference standard for production to be deemed adequate. If the quadrat sampling method is used, one of the three statistical comparison methods in CDMG Regulations 4.15.11(2) subsections (a), (b), or (c) will be used, according to the following procedures.*~~

~~*Sample adequacy will be tested during field sampling using the formula in CDMG Regulation 4.15.11(2)(a):*~~

~~*During field sampling for production, at least 15 samples (observational units) will be made at each site. Sample adequacy will be tested after 15 samples are taken, using a field laptop computer. Sampling may continue if necessary to reach sample adequacy, or sampling may be terminated after at least 15 samples are taken and a statistical method used that does note require demonstration of sample adequacy. Because dry-weight production data will not be available until samples are dried, sample adequacy will initially be calculated on fresh weights of clipped material, then recalculated later for air-dried material and additional field samples will be taken if necessary.*~~

~~*One of the following three methods will be used to compare sample means for herbaceous production between reclaimed sites and the reference standard, depending on the mean values and whether sample adequacy was reached during sampling.*~~

~~*1) If sample adequacy was demonstrated and the reclaimed site mean is equal to or greater than 90% of the reference standard, no statistical comparison is necessary and the estimated production for the reclaimed area will be deemed equal to or greater than the reference standard, with 90% statistical confidence. This complies with the provisions of CDMG Regulation 4.15.11(2)(a).*~~

~~*2) If sample adequacy was demonstrated and the reclaimed site mean is less than 90% of the reference standard, a "standard null" one-sided t-test with alpha error probability of 0.10 will be used, in conformance with CDMG Regulation 4.15.11(2)(b), as follows:*~~

~~*The null hypothesis being tested is that the mean production for the reclaimed site is greater than or equal to 90% of the reference standard, with 90% statistical confidence. If t_c is less than or equal to the 1-tailed t table value for alpha error probability of 0.10, at n-1 degrees of freedom (infinite degrees of freedom may be used if n > 30), then the null hypothesis is not rejected, and revegetation is deemed successful.*~~

~~*3) If the reclaimed area sample mean is greater than 90% of the reference standard, but sample adequacy was not demonstrated, a "reverse null" hypothesis will be tested by using a one-sided t-test with alpha error probability of 0.20, in conformance with CDMG Regulation 4.15.11(2)(c), as follows:*~~

~~*The null hypothesis being tested is that the mean production for the reclaimed site is less than or equal to 90% of the reference standard, with 80% statistical confidence. If t_c is greater than the 1-tailed t table value for alpha error probability of 0.20, at n-1 degrees of freedom (infinite degrees of freedom may be used if n > 30), then the null hypothesis is rejected, and revegetation is deemed successful.*~~

~~***Irrigated Pasture Type***. *The revegetation success standards for this type are based on the establishment of irrigated pasture as the postmining land use. Irrigated pasture should be able to attain a good level of productivity with only one to two grasses and a legume under continuing and adequate management inputs. This includes scheduled irrigation, annual fertilization based on soils tests and plant needs, and grazing management or proper harvest methods. As stated earlier in the discussion on revegetation of the irrigated pasture type, annual fertilization of irrigated pastures is part of the normal husbandry applied to maintain vigor and productivity. The requirements for establishment of woody plant densities, species diversity, and seasonal variety are irrelevant to the irrigated pasture vegetation type and postmining land use. Therefore, the standards of revegetation success for the irrigated pasture type will be based on production and "live cover".*~~

~~*As can be seen in Table 2.05.4(2)(e)-2, all local farmers harvest their irrigated fields one time during the year. There are a few farmers that attempt a second and third cutting but the majority of the production comes from the 1st cutting. The success standard for WFC's irrigated pasture will be based upon 1st cutting production only because we will then be following the local practices and customs. It needs to be emphasized that these measurements were accurately measured by Peabody in 1987 for fields that contained alfalfa hay and the yield was only 0.82 tons per acre.*~~

~~*Based on the following information, the yields for all irrigated pasture east of 2700 Road shall be 1.0 tons per acre:*~~

Considerable evidence shows that this standard is too high. See below.

1) The information from Table 2.05.4(2)(e)-~~2~~4, which shows that the yields for 1987 for irrigated hay were only (1639 lbs) 0.82 tons per acre. Although this is only one year of information, it is still carefully collected data that is not based on visual estimates.

2) The fact that most irrigated fields contain alfalfa which is a high production plant, but as years go in a given field, the percentage of alfalfa dwindles, thus lowering the yields. Since the bond release period is 10 years, the mine is handicapped since the sampling can only occur in the 9th and 10th year after seeding.

3) The general aspect of the field is south facing which robs the natural moisture from the land to a far greater degree than a flat or north facing slope. This is crucial in periods when the irrigation water is not running.

4) Recent droughts and increased temperatures have lessened the water availability in the ditch both in quantity and the time that the water starts flowing has been delayed slightly. This affects the yields as well.

5) The soils in the permit area east of 2700 Road are generally poor and are not irrigated anywhere else in Montrose County nor the surrounding counties. These soils are Progresso, Bond, Travessilla and Pinon. See Map 2.04.9 Soil Baseline Map. As seen in ATTACHIMENTAttachment 2.04.9-3 TAXONOMIC UNIT DESCRIPTIONSTaxonomic Unit Descriptions, all of these soils are thin and rocky, are generally found in New Mexico and Arizona in very dry areas, are alkaline and are primarily used for rangeland, not irrigated fields.

65) The NRCS representative of the area, Jim Boyd, has years of experience with iReclaimed Irrigated pasturesPasturelands in the area and confirms that the conditions for the reclaimed area east of 2700 Road do not warrant a yield above 1.0 tons per acre. See his letter in Attachment 2.05.4(2)(e).

7) The landowners have revised their previous letters to specifically address the average yields for mine reclaimed areas east of 2700 Road. These letters are also enclosedon the following page.

Much of this information is well after the landowner yield letters were obtained, which are included in Attachment 2.05.4(2)(e). These letters reflect a standard of 1.00 tons per acre.

It is noted that the soils west of 2700 Road are better than those on the east side, therefore the standard to meet for those areas shall remain at 1.50 tons per acre, which was-3. For these reasons, the standard for all irrigated pasture areas until the east portion was changed in 2006.

production in Reclaimed Irrigated ~~Pasture Success Standards~~

~~The success standard for cover is based on the level of premining ground cover (live vegetation) determined from the 1987 and 1999 baseline studies conducted within the New Horizon 2 study area (see Section 2.04.10). The average live vegetation cover determined from the 1987 study was 71.8 percent. In 1999 the average live vegetation cover was 76.8 percent. These values represent long-term established perennial vegetation, reflecting a reasonably constant value because of historic irrigation and management. The difference in vegetative cover is attributable to the difference in precipitation levels. As referred to earlier, 1999 was a very wet year during the 1999 growing season and the winter of 1998-1999 was mild. NRCS climate data for the San Miguel basin indicates that precipitation is currently 177% of normal. NOAA data, current through April of 1999 (Sec. 2.04.10, Tables 2.04.10-1 and 10-2) indicates a dry mild winter with a large increase in precipitation for April. While the data is not available for May through August this trend of higher than normal was verified by local residents in the Nucla area. Fluctuations in vegetative cover are relatively small because irrigation has eliminated much the precipitation variation from yearly fluctuations normally encountered in the semi-arid climate in the Nucla area. Some fluctuation in live canopy cover is expected as precipitation effects areas inadequately covered by flood irrigation and the resultant effect would be to suppress or promote vegetative cover uniformly over a pasture. Temperature fluctuations have the same relative effect. During colder more severe climate years vegetative cover would be suppressed or promoted with the respective severity or mildness of the climate for a particular year. At the high levels of production achievable under properly managed irrigated pasture, and specified in the production standard, the vegetation and ground cover will be more than adequate to meet the requirements of 4.15.1(2)(b). Since 1999 was an abnormal year climatologically, the success standard for cover will be 71.8 percent ground cover for both the original permit and the proposed permit expansion area.~~

*~~Vegetation cover and herbaceous production will be measured at reclaimed sites and~~Pastureland has been converted to a **reference area** instead of the above mentioned standard as of TR-58 in October of 2008.*

United States Department of Agriculture

NRCS

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July 11, 2006

Ross Gubka
Western Fuels Colorado
P.O. Box 628
Nucla, CO 81424

Dear Mr. Gubka:

Upon assessment of the reclaimed irrigated pastures at the Western Fuels Coal Mine near Nucla, Colorado, it is my professional judgment that the irrigated pastures east of Montrose County 2700 Road have limited production potential due to the following reasons:

1) The soils prior to mining and reclamation were shallow with low water holding capacity, approximately 18 inches to unweathered bedrock.
2) The fields generally have a southern aspect, with a slope ranging from 3 to 30 percent, which increases the plant evapotranspiration rates and the droughtiness of the site.
3) Due to the droughtiness of this site, supplemental irrigation is needed early in the spring in order to satisfy crop water requirements, commonly before the irrigation water is delivered by the Colorado Cooperative Ditch Company.

Because these soil types are limited in their production potential, they are not typically irrigated in the Nucla area. Instead, they are normally managed as rangeland or dryland pasture. As a result, there are few production records for irrigated pasture and hay for these soil types.

The agronomic management of these irrigated pastures by Western Fuels Colorado has been reviewed by me and is consistent with NRCS pasture and hayland management standards.

In the end, a realistic production goal for the above mentioned irrigated pastures is:

one ton/acre of bailed hay in June (first cutting).

If you have any further questions concerning my assessment of the reclaimed irrigated pastures on the Western Fuels Coal Mine, please contact me.

Sincerely,

Jim Boyd

Jim Boyd, NRCS Resource Conservationist

4.5.1 Reclaimed Irrigated Pastureland Soil Analysis

Jim Boyd, the local NRCS representative, reviewed the capability of all soils in the reference area and in the reclaimed area and assigned a relative factor to each of these soils. This letter is included in this subsection. As can be seen from the letter, some soils are more productive than others. The table below shows how the weighted average for the reference area is calculated. The soil types are based on the USDA - NRCS Soil Survey of San Miguel Area, which was compiled in the field from 1978 to 1984. The report was published in 1986. This survey can be obtained on the internet at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map.

In order to further account for differences in soils in the mine reclaimed areas compared to the reference area, a soil productivity factor has been developed by the local representative of the NRCS which makes adjustments to the required levels of production based on the weighted average of these factors in the reclaimed area compared to the reference area.

The table below shows how the weighted average for production from the reference area is calculated.

Table 2.05.4(2)(e)-2

Western Fuels Reclaimed Irrigated Pastureland Reference Area

Western Fuels					
Reclaimed Irrigated Pastureland Reference Area					
New Horizon #2 Mine				Weighted Average	
Soil Type	Area (acres)	% of Total	Assigned Factor		
15	2.4	35.24%	1.20	0.423	
81	1.4	20.56%	1.00	0.206	
10	1.35	19.82%	1.00	0.198	
77	1.66	24.38%	0.80	0.195	
Total	**6.81**	100.00%		1.022	**Base Case Ref Area**

As can be seen from the table above, the weighted average factor for the reference area is 1.022. Map 2.05.4(2)(e)-1 & 2 shows the NRCS soil types for the entire mine permit area. If an area of Reclaimed Irrigated Pastureland is submitted for bond release, the weighted average factor of this area is calculated based on the areas of each soil type multiplied by the associated factor. These numbers are added and divided by the total area to get the weighted average factor. This weighted average factor is then divided by the reference area weighted average adjustment factor (1.022), and the resulting value is multiplied by the reference area production sample mean to obtain the adjusted reference area sample mean. The production standard for that particular reclaimed block is [90% of] the adjusted reference area sample means. For the purpose of statistical comparisons, the reference area production sample standard deviation must be multiplied by the same value as the sample mean.

This method has the advantage of truly accounting for the differences in soil type from one area to another. This may not be necessary in other smaller tracts of Reclaimed Irrigated Pastureland at other mines, but it is important at the New Horizon #2 Mine, since there is substantial variation of soil types. Jim Boyd has stated that a few of the types are poor enough that they are simply not irrigated anywhere else in Montrose County. Others, especially some in the western part of the mine area, are better than those in the reference area.

For cover success standards, the cover in the reference area will be compared to the cover in the reclaimed area with no weighted average adjustments for soil type.

Attachment 2.05.4(2)(e) - 4 shows the location of the new Reclaimed Irrigated Pastureland reference area in addition to the dryland reference areas near the Nucla airport.

Attachment 2.05.4(2)(e) - 5 shows the Statistical Data of the 2007 Sampling of the Reclaimed Irrigated Pastureland Reference Area. Cover and Production data are included.

United States Department of Agriculture

NRCS

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October 2, 2007

To Whom it May Concern:

In regards to determining expected irrigated pasture yields, when compared to the mean of yields on a reference site established on the Western Fuels Mine property in Nucla, Colorado, I have assigned the following production factors to each soil type encountered on the mine property:

*Soil Types in Reclaimed Area		Assigned Production Factor
15		1.2
81		1.0
10		1.0
77		0.8
78		0.7
112	water	0.0
16		1.1
76		0.5
14		1.2
82		0.9
71		1.2
3		0.9

*(Soil types are designated using soil map symbols from the San Miguel Soil Survey)

With all other management practices and chemical properties of the various soils being equal, the inherent production potential of a soil is determined by its depth, texture, water holding capacity, and permeability, as well as topographic features such as slope and aspect. Excluding aspect, I have used the aforementioned soil properties to determine the relative production factors assigned to each soil type. Realize though that their can be a wide range of variability of physical and chemical properties within and among soil types.

Again, the production factors are intended to be used to establish expected yields of each soil type relative to the mean of yields on the established reference area on the Western Fuels Mine property, provided there is similar aspect, management, and plant species present across soil types and the reference area.

If you have any questions regarding this analysis, please feel free to contact me.

Sincerely,

Jim Boyd

Jim Boyd, NRCS Resource Conservationist

For Reclaimed Irrigated Pastureland areas, vegetation cover and herbaceous production will be measured at reclaimed sites and the reference area. Comparisons of the mean parameter values between the reclaimed areas and the reference area will be used to determine revegetation success, as described below. As described above in this section, the production standard is adjusted for soil types in the reclaimed area vs. the reference area.

Vegetation cover will be measured as either canopy cover or basal cover of living herbaceous and woody vegetation, as defined by ~~CDMG~~DRMS Regulation 4.15.8(3)(b). Herbaceous production will be measured as current year above-ground biomass of herbaceous vegetation, as defined by ~~CDMG~~DRMS Regulation 4.15.8(4).

Vegetation sampling for measuring reclamation success will be conducted to ensure a repeatable and unbiased estimate of each vegetation population parameter. Measurements made on the reference area will be done in the same manner and season as measurements made on reclaimed lands, to ensure valid comparisons as specified in DRMS Regulation 4.15.11(1). Measurements will be made ~~at a time during the May through September growing season~~in late May to early June immediately prior to 1st cut harvest of the reclaimed fields and prior to any growing season livestock grazing in the reference area.

Vegetation cover will be measured by a point intercept method that meets the provisions of ~~CDMG~~DRMS Regulation 4.15.11(1)(a)(i). The observational unit will be a series of points along a transect at least 5 meters in length, and at least 50 data points at regular intervals along the transect. A point sampling device supported by a rigid frame will be used to ensure unbiased and vertical point placement. ~~Cover will be calculated as percent total cover, and the mean value calculated.~~

Herbaceous production will be measured by ~~either 1)~~ a quadrat sampling method that meets the provisions of ~~CDMG~~DRMS Regulation 4.15.11(1)(b)(~~i~~i), ~~or 2) a total harvest measurement method.~~

~~Quadrat sampling method:~~. The observational unit will be a rectangular or circular plot frame at least ¼ square meter and large enough to encompass individual plants of the larger species being sampled. ~~If production sampling is done at the same time as cover sampling, quadrat locations for~~Current year growth of herbaceous non-woody species will be clipped within each quadrat. The

sampled plant material will be bagged and taken to the laboratory for drying and weighing. Samples will be oven-dried at 105 degrees C to a constant weight.

Sampling points for cover and herbaceous production ~~sampling will be located at the origin of cover transects on the left of the transect. If production sampling is done independently of cover transects, quadrats~~ will be located by using a random number generating procedure to create up to 50 random coordinate pairs within each ~~reclaimed site. A geographic positioning system (GPS) unit will be used to navigate to the sample points, in the order that the points were randomly generated. The sampling frame will be thrown over the shoulder to determine the exact sample location. Current year growth of herbaceous species will be clipped within each quadrat. The sampled plant material will be bagged, taken to a laboratory, and dried and weighed. Samples will be oven-dried at 105 degrees C to a constant weight. Weights will be divided by the area of the sampling frame in acres to determine dry weight per acre, and the mean production per acre calculated.~~

~~Harvest measurement method: This method is consistent with the method used in 1987 at the NH 2 site to determine baseline production. Upon completion of a first cutting in a field, the number of bales cut from the field will be counted. A sample of at least 15 bales will be arbitrarily selected and weighed with a portable field scale accurate to 1 pound. Care will be taken to select bales from throughout the field, or if the hay is already stacked, from many locations in the stack. At the time of weighing, a small sub-sample of hay will be collected from each bale, bagged, labeled, and weighed in the field with a Pesola scale. In the laboratory, the sub-samples will be oven dried at 105 degrees C to a constant weight, then re-weighed to determine a fresh weight to dry weight correction factor. Fresh bale weights will be multiplied by the mean correction factor to estimate bale dry weights, and the mean bale dry weight for the field calculated. Herbaceous production on a dry weight basis for the field will be estimated by multiplying the number of bales counted by the mean bale dry weight, and dividing by the number of acres in the field.~~

~~If production measured by the harvest measurement method, revegetation will be deemed adequate for herbaceous production if the mean value at the reclaimed site is equal to or greater than the standard of 1.5 tons per acre, in conformance with CDMG Regulation 4.15.8(2) for the~~

~~iirrigated pastures west of 2700 Road and 1.0 tons per acre for the irrigated pastured east of 2700 Road. No statistical comparison of the sample mean to the reference standard will be made. If production is measured by the quadrat sampling method, statistical testing is appropriate and revegetation will be deemed adequate for herbaceous production if the mean value at the reclaimed site is equal to or greater than 90% of the standard of 1.5 or 1.0 tons per acre (depending on location east or west of 2700 Road), in conformance with CDMG Regulation 4.15.8(4). Revegetation will be deemed adequate for cover if the mean value at the reclaimed site is equal to or greater than 90% of the standard of 71.8%, in conformance with CDMG Regulation 4.15.8(3).~~

~~Sample adequacy will be tested during field sampling using the formula in CDMG Regulation 4.15.11(2)(a):~~

~~During field sampling for cover and production, at least 15 samples (observational units) will be made at each site. Sample adequacy will be tested after 15 samples are taken, using a field laptop computer. Sampling may continue if necessary to reach sample adequacy. Sampling may be terminated after at least 15 samples are taken and a statistical method will be used that does note require demonstration of sample adequacy. Because dry-weight production data will not be available until samples are dried, sample adequacy will initially be calculated on fresh weights of clipped material, then recalculated later for air-dried material and additional field samples will be taken if necessary.~~

~~One of the following three methods will be used to compare sample means for cover and production between reclaimed sites and the reference standards, depending on the mean values and whether sample adequacy was reached during sampling.~~

~~1) If sample adequacy was demonstrated and the reclaimed site mean is equal to or greater than 90% of the reference standard, no statistical comparison is necessary and the estimated production for the reclaimed area will be deemed equal to or greater than 90% of the reference standard, with 90% statistical confidence. This complies with the provisions of CDMG Regulation 4.15.11(2)(a).~~

~~2) If sample adequacy was demonstrated and the reclaimed site mean is less than 90% of the reference standard, a "standard null" one-sided t-test with alpha error probability of 0.10 will be used, in conformance with CDMG Regulation 4.15.11(2)(b), as follows:~~

~~The null hypothesis being tested is that the mean value for the reclaimed site is greater than or equal to 90% of the reference standard, with 90% statistical confidence. If t_c is less than or equal to the 1-tailed t table value for alpha error probability of 0.10, at n-1 degrees of freedom (infinite degrees of freedom may be used if n > 30), then the null hypothesis is not rejected, and revegetation is deemed successful for the parameter tested.~~

~~3) If the reclaimed area sample mean is greater than 90% of the reference standard, but sample adequacy was not demonstrated, a "reverse null" hypothesis will be tested by using a one-sided t-test with alpha error probability of 0.20, in conformance with CDMG Regulation 4.15.11(2)(c), as follows:~~

~~<INSERT STATS C.JPG>~~

~~The null hypothesis being tested is that the mean production for the reclaimed site is less than or equal to 90% of the reference standard, with 80% statistical confidence. If t_c is greater than the 1-tailed t table value for alpha error probability of 0.20, at n-1 degrees of freedom (infinite degrees~~

of freedom may be used if n > 30), then the null hypothesis is rejected, and revegetation is deemed successful for the parameter tested.

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The production standard for the dryland pasture type for the New Horizon 2 (NH2) area will be based on a dryland reference area located at the Nucla Airport. This area was originally established in the summer of 2000 and augmented in 2005. The augmentation allows the reference area to be divided into two sections: one for rangeland and the other for dryland pasture. See Section 2.04.10 for more details. The Airport Dryland Reference (ADPR) area is shown in Attachment 2.05.4(2)(e) - 2 as well .

The Airport Dryland Reference area is located within the fenced boundaries of the Nucla Airport and is protected from domestic livestock grazing. Wildlife (deer, elk) winter grazing will still be allowed, as is on the NH2 reclaimed land. If the airport authorities allow domestic grazing, then WFC has an agreement with the airport authorities to fence off the three plus acre reference area so the vegetation will not be affected.

For Dryland Pasture areas, vegetation cover and herbaceous production will be measured at reclaimed sites and the reference area. Comparisons of the mean parameter values between the reclaimed areas and the reference area will be used to determine revegetation success, as described below. Vegetation cover will be measured as either canopy cover or basal cover of living herbaceous and woody vegetation, as defined by CDMG Regulation 4.15.8(3)(b). Herbaceous production will be measured as current year above-ground biomass of herbaceous vegetation, as defined by CDMG Regulation 4.15.8(4).

Vegetation sampling for measuring reclamation success will be conducted to ensure a repeatable and unbiased estimate of each vegetation population parameter. Measurements made on the reference area will be dome in the same manner and season as measurements made on reclaimed lands, to ensure valid comparisons as specified in CDMG Regulation 4.15.11(1). Measurements will be made at a time during the May through September growing season.

~~Vegetation cover will be measured by a point intercept method that meets the provisions of CDMG Regulation 4.15.11(1)(a)(i). The observational unit will be a series of points along a transect at least 5 meters in length, and at least 50 data points at regular intervals along the transect. A point sampling device supported by a rigid frame will be used to ensure unbiased and vertical point placement.~~

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~~Sampling points for cover and herbaceous production will be located by using a random number generating procedure to create up to 50 random coordinate pairs within each~~ study area (reclaimed sites and the reference area). A geographic positioning system (GPS) unit will be used to navigate to the sample points, in the order that the points were randomly generated. A stake or quadrat frame will be thrown over the shoulder to determine the exact sample location. Cover transects will be oriented along a random compass bearing from the point of origin. If production sampling is done at the same time as cover sampling, quadrats will be placed at the transect origin on the left side of the transect. Cover will be calculated as percent total cover for each transect, and the mean calculated for the study area. Production will be calculated by dividing dry weight by the quadrat frame area in acres, and the mean dry weight pr acre calculated.

~~Revegetation Success Criteria and Statistical Procedures~~

4.5.2 New Reclaimed Irrigated Pastureland Reference Area

With TR-58 a new reference area of 6.81 acres immediately south of the mine office was added to evaluate Reclaimed Irrigated Pastureland reclamation success. This reference area is shown on Map 2.05.4(2)(e)-2. The area was selected and deemed appropriate for the following reasons:

1) The water in this reference area and all mine reclaimed areas is from the same ditch of the CC Company, thereby eliminating any differences in water availability during the year. The contractor will be required by Western Fuels to apply the water to the reclaimed areas and the reference area at the same time.

2) Western Fuels owns the reference area and is in charge of the irrigation management of it. The same contractor who manages the reclaimed area will manage the reference area. This is not the case with any other Reclaimed Irrigated Pastureland area within a reasonable distance of the mine permit area.

The contractor will release water into the reclaimed area and the reference area from the CCC ditch at the same time. The flood irrigation of the reference area will be regulated to simulate the same plant application rate and conditions of the side roll irrigation of the reclaimed area. Flood irrigation may also be employed in the reclaimed area. The irrigation method in all Reclaimed Irrigated Pastureland reclaimed areas was flood irrigation prior to mining.

The expected application rate of water: Water will be applied to the reference area based on the ratio used for the irrigation of Reclaimed Irrigated Pastureland on the Lloyd property.

Plans for livestock grazing: The reference area will be grazed by cows in late June, after any vegetation studies are completed. The livestock will be removed by the end of June, and the reference area will not be further grazed by livestock during the growing season. The reclaimed area will be hayed in late June after any vegetation studies are completed. Winter grazing by cows, deer and elk occur on all areas.

Plans for haying: The reclaimed area is hayed in late June after any vegetation studies are completed. The reference area is too small to hay, therefore, it is grazed to simulate the haying. The contractor will be instructed to graze the reference area to this same degree.

Plans for fertilization: Fertilizer may be applied to the reference area and the reclaimed area but must be done at the same time and the same rate per acre on both areas. The application rate will be similar to normal practices in the surrounding area for Reclaimed Irrigated Pastureland. The contractor will be instructed that this practice must be followed. Fertilizer may not be applied every year. It will be applied at the frequency that is normal good practice for the area and the soils, as determined by NRCS.

3) The reference area is adjacent to the mine and contains many of the same soils which are present in the reclaimed area.

4) The site has been inspected by the NRCS and found to be acceptable as a reference area.

5) Characterization of the reference area is as follows:

The Reclaimed Irrigated Pastureland reference area is a typical irrigated pasture in the Nucla area. Vegetation is almost entirely herbaceous species, mainly introduced perennial pasture grasses planted for livestock forage. Flood irrigation results in uneven water application, and as a result the species composition within the reference area varies with soil moisture. On most of the reference area where soil moisture is moderate, at least 8 species of upland perennial grasses are dominant, with Kentucky bluegrass, tall fescue, wheatgrasses, and meadow fescue the most dominant (Attachment 2.05.4(2)(e)-5 shows production and cover summary data from 2007 vegetation sampling, and scientific names of plants). Desirable perennial forbs are much less common, and include mainly Alsike clover with minor amounts of dandelion. In shallow drainageways the soil is saturated during the growing season and wetland plants dominate primarily various species of sedge and rush with minor amounts of tufted hairgrass, buckhorn plantain, common plantain, and rarely cattail.

In June 2007, mean cover of total vegetation measured at 15 transects was 71.9% (see Attachment 2.05.4(2)(e)-5). Most of the remaining cover was litter, with very little bare ground (3.5%). Most of the vegetation is desirable (perennial grasses, grass-like plants, and forbs, excluding noxious weeds), comprising 68.6% cover. Of these, Kentucky bluegrass and tall fescue contribute nearly 48% relative cover (the fraction of total vegetation cover), and sedges, rushes, and wheatgrasses comprise 32% relative cover. Among life forms, desirable perennial grasses (including sedges and rushes) are dominant by far (64% cover, 89% relative cover), and desirable perennial forbs (primarily Alsike clover) are next (4.5% cover, 6.2% relative cover). Undesirable species together comprise total cover of 3.3% and relative cover of 4.6%. These include shrubs (gumweed), a few weedy annual forb species, and the noxious weed field bindweed; each of these life forms contributes 1.5% or less total cover.

Mean total production measured in June 2007 at 44 plots was 2,677 lb/acre for all vegetation, and 2,513 lb/acre for desirable vegetation. Perennial grasses (including sedges and rushes) contribute most of the production, at 2,436 lb/acre (97% of desirable production and 91% of total production). Forbs made up most of the remaining plant production, with a minor contribution from shrubs (gumweed) and the noxious weed species field bindweed.

The reference area pasture is in good ecological condition. Soil erosion is minimal, there are no significant gullies or rills, and very little bare ground. Desirable plant species composition is diverse, which provides a robust vegetation stand able to resist some variability in irrigation water application or grazing regimes. Some drier areas tend to be dominated by weedy annual forbs, gunweed, and occasionally cheatgrass, but these areas make up only a small fraction of the reference area, and are typical of flood-irrigated pastures in the Nucla area.

The reference area vegetation is representative of the pre-mine irrigated pasture type in the permit area. Irrigated pastures in the permit area were originally mostly dominated by native sagebrush shrublands or pinyon-juniper woodlands. When converted to irrigated pasture, trees and shrubs were typically removed mechanically or by flooding, and plant species desired for livestock forage were seeded including perennial grasses and forbs such as alfalfa and clover. These irrigated pastures are intended primarily to provide winter forage for livestock, and secondarily to provide cut hay. Uneven application of flood-applied water is typical because of variable terrain, and wet areas soon become dominated by wetland grasses and forbs, and sometimes Russian-olive or emergent wetland plants such as cattail or bulrushes. Weedy annual forbs and cheatgrass typically become established on drier sites, and many become dominant in disturbed areas. The species composition and ecological condition of pre-mine irrigated pastures in the permit area varies widely depending on irrigation water availability and management history.

A comparison of the 2007 vegetation data in the reference area with pre-mine studies conducted by Peabody Coal Company in 1987 and WFC in 1999 (in Attachment 2.05.4(2)(e)-5) and Attachment 2.05.4(2)(e)-2) shows that the reference area vegetation is similar to pre-mine vegetation in the irrigated pasture type. The 1987 total vegetation cover was 71.8% and dominated by perennial graminoids, mostly seeded pasture grasses with Kentucky bluegrass the most dominant, all similar to the 2007 reference area measurements. See Table 2.05.4(2)(d)-3. Mean herbaceous production was measured at 2,823 lb/acre, similar to the 2007 reference area mean.

In 1999, estimates of mean cover in 2 subjectively selected irrigated pastures (deemed representative of “typical” conditions) were also similar, showing perennial grass cover of 44.5%, perennial forb cover of 33.3%, and total desirable vegetation cover of about 79%. Annual herbaceous production was estimated at 4,153 lb/acre. The 1999 mean is higher than the 2007

mean measured in the reference area, but the irrigated pasture type has been demonstrated in 1987 and 1999 sampling to be extremely variable in production depending on site factors, management, and maintenance.

Table 2.05.4(2)(e)-3

Mean Cover (Percent) and Frequency Values For The Irrigated Pasture Vegetation Type, New Horizon 2 Study Area, 1987

Species	Mean Percent Cover (N=15)	Frequency
Perennial Graminoids		
Agropyron repens	2.8	33
Agrostis alba	1.2	20
Bromopsis inermis ssp. inermis	.1	7
Dactylis glomerata	9.2	67
Eleocharis macrostachya	0.1	7
Festuca arundinacea	3.1	33
Festuca pratensis	0.5	20
Hordeum jubatum	1.1	13
Muhlenbergia asperifolia	1.3	20
Phleum pratense	3.1	60
Poa pratensis	20.5	87
Total Perennial Graminoids	**43.0**	**---**
Perennial Forbs		
Aslepias subverticulata	0.1	7
Convolvulus arvensis	0.4	20
Medicago sativa	0.3	13
Platago lanceolata	14.0	93
Plantago major	0.1	7
Taraxacum officinale	2.7	53
Trifolium pratense	2.0	47
Trifolium repens	8.5	80
Perennial forb (unk)	The 1987 total vegetation cover was 71.8% 0.4	
13		
Total Perennial Forbs	**28.5**	**---**
Annual Forbs		
Erodium cicutarium	0.2	7
Medicago lupulina	0.1	7
Total Annual Forbs	**0.3**	**---**
Total Vegetation (First Hit)	**71.8 s = 11.9**	
Litchen and Moss	0.3	
Litter	22.7	
Bare ground	5.1	
Rock	0.3	

Minimum sample size required (n_{min}) = 8 (based on total vegetation)

=

4.5.3 Revegetation Success Criteria and Statistical Procedures - Reclaimed Irrigated Pastureland

Revegetation will be deemed adequate if vegetation cover and herbaceous production at the reclaimed site is at least 90% of the vegetative cover at the reference area and herbaceous production is at least 90% of the reference area standard, after the weighted average soil adjustment, in conformance with ~~CDMG~~DRMS Regulations 4.15.~~18(3) and (4)~~8. The weighted average factor will be applied to production only. One of the three statistical comparison methods in ~~CDMG~~DRMS Regulations 4.15.11(2) subsections (a), (b), or (c) will be used, according to the following procedures.

For a quality standard, the following is proposed:

At least 75% of the relative production will be comprised of seeded species or species of comparable quality as livestock forage. County listed noxious weed species will **not** be counted toward the success standard for cover or production in any reclaimed or reference areas. For the purposes of this demonstration, a statistically adequate production sample will be taken, or a minimum of 30 observations.

Sample adequacy will be tested during field sampling using the formula in ~~CDMG~~DRMS Regulation 4.15.11(2)(a), as follows:

$$n_m = \frac{t^2 s^2}{(d\bar{x})^2}$$

where:

n_m = minimum sample size

s^2 = Sample variance (n-1 degrees of freedom)

d = Precision (0.10 for cover and production; 0.15 for woody plant density)

$\bar{x}$ = Sample arithmetic mean

t = The (α=.10) t-table value for a 1 tail t-test, n-1 degrees of freedom (infinite degrees of freedom may be used if n>30)

n = Sample size

During field sampling for cover and production, at least 15 samples (observational units) will be made at each site. Sample adequacy will be tested after 15 samples are taken, using a field laptop computer. Sampling may continue if necessary to reach sample adequacy, or sampling may be terminated ~~after at least 15 samples are taken and a~~before sample adequacy is reached if an alternative statistical method (approved by DRMS) can be used that does note require demonstration of sample adequacy. Alternative procedures will require a minimum of 30 samples, as detailed below. Because dry-weight production data will not be available until samples are dried, sample adequacy will initially be calculated on fresh weights of clipped material, then recalculated later for air-dried material and additional field samples will be taken if necessary.

Reclaimed area cover and production will be compared to a standard equal to the mean values measured at the reference area by sampling, as described below. Revegetation will be considered "successful" if the mean value for the reclaimed site can be demonstrated to equal or exceed "*Q*" (*Q*=90% of the standard). One of the following ~~three~~four methods will be used to compare ~~sample means for cover and herbaceous production between~~mean values at reclaimed sites ~~and the reference area~~to *Q*, depending on the mean values and whether sample adequacy was reached during sampling.

1) If sample adequacy ~~was demonstrated~~exists at the reclaimed site and the reference area, and the reclaimed site mean is equal to or greater than ~~90% of the reference area mean~~*Q*, no statistical comparison is necessary and ~~the revegetated area estimate for that population~~

~~parameter~~revegetation at the reclaimed site will be deemed ~~equal to or greater than 90% of the value for the reference area, with 90% statistical confidence~~successful for the parameter in question. This complies with the provisions of ~~CDMG~~DRMS Regulation 4.15.11(2)(a).

2) If sample adequacy ~~was demonstrated~~exists at the reclaimed site and the reference area, and the mean value at the reclaimed site ~~mean~~ is less than ~~90% of the reference area mean~~Q, a "standard null" one-sided t-test with alpha error probability of 0.10 will be used, in conformance with ~~CDMG~~DRMS Regulation 4.15.11(2)(b), using the general form of the one-sided t-test as follows:

$$t_c = \frac{Q - \bar{x}}{S_{\bar{x}}}$$

Where:

$\bar{x}$ = Bond Release Block Sample Mean
Q = 90% of Standard
$S_{\bar{x}}$ = Standard error of mean $[s/\sqrt{n}]$
S = Sample standard deviation
n = Sample size
t_c = Calculated t value
t_t = Table t value

The null hypothesis being tested is that the mean ~~parameter~~ value ~~for~~at the reclaimed site is greater than or equal to ~~90% of the reference area mean parameter value~~Q, with 90% statistical confidence. If t_c is less than or equal to the 1-tailed t table value for alpha error probability of 0.10, at n-1 degrees of freedom (infinite degrees of freedom may be used if n > 30), then the null hypothesis is not rejected, and revegetation is deemed successful ~~for the parameter tested.~~

~~3) If the reclaimed area sample mean is greater than 90% of~~.

3) If sample adequacy is not achieved at the reclaimed site, but is achieved at the reference area ~~mean, but sample adequacy was not demonstrated for the parameter tested~~, and the following 2 conditions are met: 1) a minimum of 30 samples were taken at the reclaimed site, and 2) mean production at the reclaimed site is greater than *Q*, a "reverse null" hypothesis will be tested ~~by~~ using a one-sample one-sided t-test with alpha error probability of 0.20, in conformance with ~~CDMG~~DRMS Regulation 4.15.11(2)(c)~~, as follows~~. The following form of the t-test will be used :

$$t_c = \frac{\bar{x} - Q}{S_{\bar{x}}}$$

Where:

$\bar{x}$ = Bond Release Block Sample Mean
Q = 90% of Standard
$S_{\bar{x}}$ = Standard error of mean $[s/\sqrt{n}]$
S = Sample standard deviation
n = Sample size
t_c = Calculated t value
t_t = Table t value

The null hypothesis being tested is that the mean ~~parameter~~ value ~~for~~at the reclaimed site is less than or equal to ~~90% of the reference area mean parameter value~~*Q*, with 80% statistical confidence. If t_c is greater than the 1-tailed t table value for alpha error probability of 0.20, at n-1 degrees of freedom (infinite degrees of freedom may be used if n > 30), then the null hypothesis is rejected, and revegetation is deemed successful for the parameter ~~tested.~~

in question.

4) If sample adequacy is not achieved in the reference area (regardless of whether sample adequacy is achieved in the reclaimed area), success will be demonstrated by use of the two-sample “reverse null” t-test with Satterthwaite approximation of standard error and degrees of freedom. The test can be used if the following 2 conditions are met: 1) a minimum of 30 sample observations are taken in the reclaimed area and also in the reference area, and 2) the reclaimed area sample mean is greater than *Q*.

To use this test, first the Satterthwaite standard error is calculated as

$$SE_{sat} = \sqrt{\frac{s_{br}^2}{n_{br}} + \frac{\left((0.9)s_{ref}\right)^2}{n_{ref}}}$$

Where:

SE_{sat} = Satterthwaite-approximated Standard Error

s_{br} = bond release site (reclaimed site) sample standard deviation

s_{ref} = reference area sample standard deviation

n_{br} = bond release site (reclaimed site) sample size

n_{ref} = reference area sample size

Next, the Satterthwaite degrees of freedom are calculated as

$$df_{sat} = \frac{\left(SE_{sat}\right)^4}{\left(\frac{\left(SE_{br}\right)^4}{n_{br}-1}\right) + \frac{\left((0.9)\left(SE_{ref}\right)\right)^4}{n_{ref}-1}}$$

Where:

df_{sat} = Satterthwaite-approximated degrees of freedom

Lastly, a one-sided reverse-null t-test with alpha = 0.20 is used as follows:

$$t = \frac{\overline{X}_{br} - \left((0.9)\overline{X}_{ref}\right)}{SE_{sat}}$$

Where:

t = calculated t-value

X_{br} = bond release site (reclaimed site) sample mean

X_{ref} = reference area sample mean

The null hypothesis being tested is that the mean value for the reclaimed site is less than or equal to Q. If the calculated t value is greater than the table t value (alpha = 0.20, df_{sat}), then the null hypothesis is rejected and revegetation is deemed successful for the parameter in question.

4.6 Liability Period Management - Reclaimed Irrigated Pastureland

Maintenance activities will include the normal monitoring for and repair of excessive rilling or gulling, weed and pest control. The rill and gully management and stabilization plan is detailed after the end of this section. Weed and pest control management will be conducted as necessary and in accordance with the plan described after the end of this section.

Grazing of the Reclaimed Irrigated Pastureland will not be considered during the first season in order to reduce trampling and pulling of the plants by livestock. Harvesting (mechanical) will be used to remove any significant growth during the first season. After the first season, and depending on the size of the management unit and availability of additional management units, grazing may be implemented in the winter. Harvesting will continue to be considered as a management option if grazing is not implemented in any given year. Harvested hay will be removed from the fields as rapidly as hay quality and weather conditions permit.

Grazing that occurs on the reclaimed lands will also be duplicated to the same degree and the same time on the Irrigated Pasture reference area.

As shown on the NRCS letter on the following page, interseeding is allowed in Reclaimed Irrigated Pastureland as a normal husbandry practice. This may be utilized during the liability period.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
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October 17, 2007

To Whom it May Concern:

It is a common agricultural practice to "interseed" legumes into existing irrigated pastureland or hayland to increase the production and protein content of the pasture or hay, and to improve the nitrogen fertility of the soil. Interseeding means that the seed is applied to the existing field using either a drill or by broadcast application, without any mechanical soil preparation conducted prior to seeding. Interseeding of legumes usually occurs when the pastureland or hayland is dominated by grasses, and the producer wants the benefits of a grass/legume mix and/or more production.

Another advantage of the interseeding of legumes into existing grass pastures or hayland, is that broadleaf herbicides can be used to control broadleaf weeds in the grass stands for a few years, before interseeding the legumes, which are susceptible to the aforementioned herbicides.

It is less common to interseed grasses into existing pasture or hayland, unless the initial germination and establishment is poor and further tillage operations are deemed unnecessary. Seedbed preparation is expensive, and furthermore, it dries out the soil and brings new weed seeds to the soil surface; so if the initial seeding is spotty and there is a lot of bare ground, then an interseeding of grasses and/or legumes may be effective. Interseeding grasses into a grass stand tends to be less effective than interseeding legumes into a grass stand, but successes of the former are not unheard of.

If you have questions or would like to discuss this topic further please contact me.

Sincerely,

Jim Boyd

Jim Boyd, NRCS Resource Conservationist

5.0 - Revegetation - Irrigated Cropland

5.1 General Information

The Irrigated Cropland (IC) post-mining land use will occur on all lands identified by the NRCS as prime farmlands after their review of the soils in the permit area in 2008. These lands are the entire Morgan property of 107.96 acres in the permit area and an area of 3.96 acres on the western WFC property near Tuttle Draw. Map 2.05.4-5 shows the reclamation land uses of the entire site, including irrigation infrastructure. The species planted will be dominated by alfalfa, as desired by the landowner, Morgans. The entire plan for reclamation of the Morgan fields has been presented to them by WFC by paper copy in June of 2010 and discussed with them in person by mine personnel. The letter showing delivery of the June 2010 relevant sections of the permit revision is included in Attachment 2.05.4(2)(e)-8.

All lands restored to Irrigated Cropland will meet the Prime Farmland requirements under Rule 2.06.6.

5.2 Irrigation Designs

For Irrigated Cropland areas, all irrigation designs have been based on calculations from the local NRCS representative, Jim Boyd. Irrigation will be accomplished with side roll sprinklers and flood irrigation supplied by 4 inch to 10 inch supply lines. Water will be applied at a rate based on the irrigation calculations presented in Attachment 2.05.4(2)(e)-7 (IC). Referenced but not scanned

The irrigation designs for the Morgan property IC areas use a different field labeling than the pre-mine field designations. The post-mine fields and brief descriptions of the irrigation type (sideroll or flood) can be seen on Map 2.05.4-5, with the old Morgan field labels shown for comparison.

Field A Northwest field on Morgan property; irrigated by sideroll; see Sideroll Irrigation Design in Attachment 2.05.4(2)(e)-7.

Field B Southwest field on Morgan property; irrigated by sideroll; see Sideroll Irrigation - Morgan Design in Attachment 2.05.4(2)(e)-7.

Field C North-central field on Morgan property; irrigated by sideroll; see Sideroll Irrigation Design - Morgan in Attachment 2.05.4(2)(e)-7.

Field D Northeast field (Sunshine Corner) on Morgan property; flood irrigated; see Flood Irrigation Design - Morgan Sunshine Corner in Attachment 2.05.4(2)(e)-7.

Field E South-central triangular field on Morgan property; flood irrigated; see Flood Irrigation Design - Morgan Triangle in Attachment 2.05.4(2)(e)-7.

The NRCS supplied full calculations for irrigating 97.5 acres of the Morgan property, using 50 shares of the CCC Ditch. The Morgans have agreed to supply 62 shares of water and supplement it with whatever is needed in a particular year, to ensure that their entire property within the permit area is irrigated. This letter is provided in Attachment 2.05.4(2)(e)-7. Map 2.05.4-5 shows the layout of each of the 3 sideroll irrigated fields proposed for the Morgan property, and the 2 flood irrigated areas on the Moran property.

5.3 Seed Mix Information

Seed Mix #7 has been revised to contain alfalfa for the Irrigated Cropland. Triticale is included as a companion crop in Seed Mix #7 for cover in the any year that the seed mix is planted. The recommended alfalfa varieties have done well in the region (T. Doherty, personal communication, April 1988). This mix is to be applied to all Irrigated Croplands in the fall of Years 1 and 7. Initial seeding of the green manure crop occurs in the Spring of Year 1.

Prior to initial planting of seed mix #7, the 1st year for any reclaimed Irrigated Cropland area will utilize the Green Manure Crop Mix, as defined below:

Green Manure Crop Mix (Spring of 1st year for any reclaimed Irrigated Cropland)

Oats at the rate of 75 lbs per acre
Yellow Sweet Clover at the rate of 2 lbs/acre

Seed Mix #2 is used at the start of Year 7 to allow renovation of any alfalfa planted field in the fall of Year 7.

Seed Mix #2 - Year 7 Annual Small Grain Temporary Crop Mix (Spring planting)
Note: Any one, and only one of the 3 species can be planted at the rate shown.

SpeciesCommon Name	Seeding Rate
1. Barley*	75 lbs/acre
2. Spring Wheat *	75 lbs/acre
3. Oats*	75 lbs/acre

*Note: Species selection will be based upon land owner preference and availability of seed.

Seed Mix #7 - Irrigated Alfalfa Cropland Mix (IC) Land Use

Species Scientific Name	Common Name	Drilled Rate lbs. PLS/Acre*
1. Medicago sativa	Alfalfa	20
2.	Triticale	25

Note: Alfalfa seed must be inoculated with a specific strain of Rhizobium bacteria. The triticale will act as a companion cover crop whenever the planting of the alfalfa occurs in the fall.

Seed Mix #7 - Recommended Varieties

Alfalfa - Lahontan (Vernal, Ladak 65, Dawson or other recommended flemish varieties)*
The Morgans also would like to be able to use AV120 and SS120 alfalfa (Medicago Sativa) from Arkansas Valley Seed Company.
Other varieties may be used, upon approval with the landowner and the NRCS. New species may be developed which are better suited to these site conditions and soils.

5.4 Irrigated Cropland Seeding Procedures

The optimum seeding season for establishment of Irrigated Cropland (alfalfa) is in the late summer, around August 21, provided adequate irrigation water is available. This will allow for 6-8 weeks of growth, which is enough time to establish an adequate stand capable of over-wintering. During seeding of all Irrigated Croplands (IC) with the permanent seed mix, an annual companion grain cover crop of Triticale will be used at the rate of 40 lbs per acre. This will provide rapid growth so little topsoil is lost to erosion while at the same time providing some nitrogen and organic matter to the soil. This practice will help rejuvenate soils that have been in stockpiles for long periods of time.

At times, the size or shape of the retopsoiled areas and shape of the reclaimed area in relation to a management unit may be insufficient to warrant establishment of the perennial irrigated pasture species initially. When this occurs, and the period before establishment of permanent irrigated

pasture will extend beyond a year, Seed Mix #3 - Temporary Reclamation, will be used. This mix will provide interim stabilization as well as organic matter benefits when incorporated during tillage and seedbed preparation prior to seeding of the irrigated pasture seed mixes.

Seeding will be done either with a cultipacker type seeder or a drill equipped with double-disk openers, depth bands, and packer wheels. A cultipacker may be used behind the drill to also firm the seedbed. Either of these two types of seeding equipment will provide the greatest level of success in terms of proper seed placement and firming of the soil around the seed. Seeding depths are usually about 1/4 inch deep for the species to be seeded, and never more than ½ inch deep. If it is determined that the drill seeding method is not desirable for a particular area, then a broadcast seeder will be utilized to distribute the grass seed onto the surface of the ground. A large tractor mounted broadcaster having the capacity of holding several bushels of grass seed will be used and the tractor will traverse the field such that overlapping of the seed will occur. After the seed is broadcasted, a spring tooth harrow will be drug over the field to bury the seed approximately 1/4 inch. Since not all of the seed will be covered, the seed rate will be increased 100% over the drilled seed rate. If the harrow is not utilized, such as in a topsoil stockpile situation, then the broadcast rate will be double the drilled rate.

In order to manage the cropland fields properly, a sequence of operations over the liability period has been developed and is included in Subsection 5.7.1.

In this liability management period, re-plowing of cropland to restore the health of the fields, will occur during the bond release period, which is a normal husbandry practice. The initial use of a green manure crop in the 1st year is also essential since much of the topsoil will be placed from stockpiles that have been in place for a significant amount of time.

See letters in Attachment 2.05.4(2)(e)-11 from Jim Boyd, the local NRCS specialist, which substantiate these practices.

5.5 Irrigated Cropland Success Criteria and Success Demonstration

5.5.1 General

Two areas of irrigated cropland will be established on reclaimed land on the amended area within the New Horizon permit area. One area occurs in the southwestern portion of the permit area (NE1/4, NE1/4, Sec. 1, T.46N., R.16W.). The area (Morgan property) will be reclaimed to an alfalfa irrigated cropland, using Seed mix #7, as detailed earlier. The acreage of the area, based on the water availability calculations, is 107.96 acres.

The second area is located at the northwest corner of the permit area near, as of April 2010, Pond 013. Since Pond 013 will be in place for a lengthy period of time (>5 years) the irrigated cropland area will be built to the southeast of the pond, and will connect to undisturbed areas to the north. This can be seen on Map 2.05.4-5. Since 3.96 acres will be disturbed, the irrigated cropland area built will be 3.96 acres. It is important to note that all reclaimed irrigated cropland is also classified as prime farmland, and, as such, will meet all the requirements of Rule 4.25 and 2.06.6.

5.5.2 Standard for Production for Irrigated Cropland (formerly Irrigated Hayland)

Irrigated Hayland was a former planned post-mine use in the reclamation of the mine. It has been replaced by either Irrigated Cropland (IC) or Reclaimed Irrigated Pastureland (IP), depending upon the soils, past production, and intensity of the management. The Reclaimed Irrigated Pastureland has a higher percentage of grass and the irrigated cropland is mostly alfalfa. The former irrigated hayland was a combination of the two vegetation types. The previous production standard for irrigated hayland is given below.

As can be seen in Table 2.05.4(2)(e)-4, there is a wide variation in the number of hay cuttings the local Nucla farmers get during the year. Everyone gets one cutting and there are a few farmers that attempt a second and third cutting. The majority of the production comes from the 1st cutting however. The success standard for WFC's irrigated cropland will be based upon 1st cutting production only so our yield can be easily compared with the local farmers. WFC personally contacted three of the larger farms (Mel Staats, Frank Morgan and Zene Weimer) that surround NH2 for their first cutting production figures in irrigated cropland fields (See Attachment

2.05.4(2)(e)-3). They gave us their estimates of first cutting crop yield for irrigated cropland in the Nucla area. Since these farmers had no practical way to weigh the bales, the reported yields were based on non-dried bale weights. The approved standard for Irrigated Cropland (previously called Irrigated Hayland) was the average 1st cutting yield from these three farmers. Based on this, a 1st cutting production of 1.84 tons per acre is the target yield at New Horizon Mine. No drying is done for attaining this standard since none was done by the 3 farmers used to determine their yields which is the basis of their letters and consequently the basis of the standard. Drying was employed to determine the 1987 data collected, shown in Table 2.05.4(2)(e)-4, but this data was not used to determine the standard of 1.84 tons per acre. The farmer letters in Attachment 2.05.4(2)(e)-3 were the basis for the standard. During the 1999 baseline vegetation survey (Sec. 2.04.10) the average yield for all pastures was 2.00 tons/acre. The yield ranged from a high of 4.26 tons/acre for highly managed alfalfa to a low of .57 tons/acre for unirrigated grassland. 1999 was a very wet year in western Colorado (177% of normal for 1999 to date, NRCS San Miguel Basin Precipitation Data) and could explain the slight increase in overall production (2.00 tons/acre vs 1.84 tons/acre). Therefore, the 1.84 tons/acre is the standard applied to Irrigated Cropland. Only the 1st cut of the filed will be measured against this standard.

For a quality standard, the following is proposed:

At least 75% of the relative production will be comprised of seeded species or species of comparable quality as livestock forage. County listed noxious weed species will **not** be counted toward the success standard for cover or production in any reclaimed areas. For the purposes of this demonstration, a statistically adequate production sample will be taken, or a minimum of 30 observations.

Table 2.05.4(2)(e)-4

Weighted Average of Annual Production For Irrigated Hayland Type, New Horizon 2 Study Area 1987

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OPERATOR	CUTTING	ACREAGE	PRODUCTION LBS/ACRE	WT AVERAGE	DATA SUMMARY
Garvey	1ST CUTTING	30.1	1,333	40,123	~~Appendix~~*Appendix 10-2 (Table 2-3)
GoForth	1ST CUTTING	10.5	3,021	31,721	~~Appendix~~*Appendix 10-2 (Table 2-4)
San Miguel	1ST CUTTING	31.3	1,168	36,558	~~Appendix~~*Appendix 10-2 (Table 2-5)
Burbridge	1ST CUTTING	26.9	1,758	47,290	~~Appendix~~*Appendix 10-2 (Table 2-6)
Staats	1ST CUTTING	8.4	2,380	19,992	~~Appendix~~*Appendix 10-2 (Table 2-7)
TOTAL		107.2	9,660	175,684	
WT AVE				**1,639**	
Garvey	2ND CUTTING	30.1	1,050	31,605	
GoForth	2ND CUTTING	10.5	3,235	33,968	Peabody Appendices
San Miguel	2ND CUTTING	31.3	0	0	
Burbridge	2ND CUTTING	26.9	0	0	
Staats	2ND CUTTING	8.4	0	0	
TOTAL		107.2	4,285	65,573	
WT AVE				**612**	
Garvey	3RD CUTTING	30.1	0	0	
GoForth	3RD CUTTING	10.5	1,557	16,349	
San Miguel	3RD CUTTING	31.3	0	0	
Burbridge	3RD CUTTING	26.9	0	0	
Staats	3RD CUTTING	8.4	0	0	
TOTAL		107.2		16,349	
WT AVE				**153**	

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YEARLY PRODUCTION (pounds per acre) 2,403 (use 2,400 lb/ac)

* Appendix 10-2 = Attachment 2.04.10-6

5.5.3 Harvest measurement method

A minimum of 3 years of Irrigated Cropland production will be measured in the reclaimed area. This will begin in Year 9 after seeding. For each year, upon completion of a first cutting in a field, the number of bales cut from the field will be counted. A random number generator will be used to select samples. A sample of at least 15 bales will be randomly selected and weighed according to the procedures described below. No drying will take place, since no drying was accounted for when the data was collected to determine the standard.

Bale weight measuring on the Morgan IC areas will be conducted using either a) a truck mounted scale in the field for small bales (<100 lbs) or b) large bales (>100 lbs) loaded onto a semi-truck and weighed at a certified truck scale. The truck scale will be either the existing one at the nearby power plant, or, as an alternative, a local gravel mine, or, if none of these are available, WFC will rent a scale for use on site. Any scale used will be certified with an accuracy of 1 pound or better.

Sample adequacy will be tested during field sampling using the formula in DRMS Regulation 4.15.11(2)(a), as follows:

$$n_m = \frac{t^2 s^2}{(d\bar{x})^2}$$

where:

n_m = minimum sample size

s^2 = Sample variance (n-1 degrees of freedom)

d = Precision (0.10 for cover and production; 0.15 for woody plant density)

$\bar{x}$ = Sample arithmetic mean

t = The ($\alpha = .10$) t-table value for a 1 tail t-test, n-1 degrees of freedom (infinite degrees of freedom may be used if $n > 30$)

n = Sample size

During field sampling for production, at least 15 samples (observational units) will be made at each site to be tested for bond release. Sample adequacy will be tested after 15 samples are taken, using a field laptop computer. Sampling may continue if necessary to reach sample adequacy.

or sampling may be terminated before sample adequacy is reached if an alternative statistical method (approved by DRMS) can be used that does note require demonstration of sample adequacy. Alternative procedures will require a minimum of 30 samples to attain sample adequacy.

Once the bale weighs are obtained, the average weight calculated and is then multiplied by the total number of bales in the field to obtain the estimated full production from the field. This amount is then divided by the total acreage of the field to obtain the average production.

5.5.4 Revegetation Success Criteria and Statistical Procedures - Irrigated Cropland

WFC has addressed these standards to meet the prime farmland requirements of 4.25.5(3).

Three consecutive years of harvest data will be collected starting in Year 9 after initial seeding. An average of the 3 years 1st cut production will be calculated and compared to the fixed production standard of 1.84 tons per acre for the 1st cut. Production success for the reclaimed block will be achieved if direct comparison of the 3 year average 1st cut production equals or exceeds 100% of the of the 1.84 tons per acre standard. This complies with Rule 4.25.5(3)(d) for prime farmland, which takes precedence over Rule 4.15.9 where prime farmland is involved.

If the 3 year average does not meet the above standard, the field will be managed in the 4th year using the same procedures described in the management plan of Subsection 5.7.1 for years 8-11. Production data will be collected as described above for that year. A new average is calculated based on the best 3 years of data. If this 3 year average is equal to or exceeds the fixed production standard of 1.84 tons per acre for the 1st cut, then production success is met. If this 3 year average does not meet the requirement, the 5th year is managed in the same way and the best 3 of 5 years are used to calculate an updated 3 year average, compared to the fixed production standard of 1.84 tons per acre for the 1st cut. Production success for the reclaimed block will be achieved if direct comparison of the updated 3 year average 1st cut production equals or exceeds 100% of the of the 1.84 tons per acre standard.

5.6 Irrigated Cropland Interim Monitoring

For Irrigated Cropland (on Prime Farmland), interim sampling will occur in Years 5and 8 since Year 1 will have a green manure crop and Year 6 will have an annual oats/barley crop. Interim sampling is not the same as the sampling required for a Phase 2 bond release. The interim monitoring is to provide the Division, the landowner and WFC the information needed to assess the progress and make any necessary adjustments, if needed. For the interim monitoring in Years 5 and 8, a qualified professional will make assessment of the following items and provide the results in a report, which will be submitted to the landowner and the Division:

A) Assess species composition to determine the approximate % alfalfa, % weeds, % oats/barley, % annuals and % perennial grasses. This test will be done immediately prior to the 1st cut time frame in Years 5 and 8.

B) Make a determination if the following condition is met: at least 75% of the relative production will be comprised of seeded species or species of comparable quality as livestock forage.

C) If small bales are used (< 100 lbs.) in the harvest in these years, a minimum of 15 samples will be randomly taken and weighed using a portable scale. No drying will be conducted. If the very large bales are used (>500 lbs.), a minimum of 6 bales will be randomly selected and weighed, by taking the bales on a truck for weighing at the truck scale at the local power plant or a nearby gravel pit. If none of these are available, a scale will be rented to conduct the weighing. The bale weights will be converted to a production per acre of the desirable species.

Final monitoring for bond release will occur in years 9, 10, and 11. Final monitoring of Irrigated Cropland will consist of evaluations to meet all requirements in the success standards.

5.7 Irrigated Cropland - Liability Period Management

Irrigated Cropland will be managed to a high level due to the presence of prime farmland soils and water availability. The management of the irrigation system on the Morgan property will be performed by the Morgans themselves at WFC's expense. The Morgans will also receive all crops produced from their property in the permit area.

5.7.1 Management Sequence

The following narrative describes the sequence of steps for the revegetation process of Irrigated Cropland.

Year 1 - In Spring, place topsoil and conduct topsoil preparation and seedbed preparation according to Section 2.05.4 (2)(d). Also in Spring, seed green manure crop of oats which is to be seeded at the rate of 75 lbs/acre with yellow sweet clover at the rate of 2 lbs per acre, which will be drill seeded into the uncompacted topsoil. This seeding will be done during the time interval from April 15 to April 30. Allow green manure crop to grow during this irrigation season. Harvest the crop at the end of June. Soon after harvest, disk in the oat and yellow sweet clover stubble. The yellow sweet clover will help to add organic material to the soil and help it rejuvenate from the stockpiles. Around August 21 of this year, plant seed mix #7, which is 20 lbs per acre alfalfa and 40 lbs per acre triticale. Provide irrigation water to establish the crop before winter. This planting is recommended by the NRCS local office. See letter in Attachment 2.05.4(2)(e)-11.

Year 2-6 - Fertilize and irrigate the land, and harvest according to normal management procedures.

Year 6 - In Fall, plow down the alfalfa crop and let it sit over the winter.

Year 7 - Disk the soil using a disker to a depth of 24 inches, and plant Seed Mix #2 in the Spring. This is an annual small grain crop. Harvest the crop at the end of June. Soon after harvest, disk in the small grain stubble. Around August 21 of this year, plant seed mix #7 (using a high yield

variety), which is 20 lbs per acre alfalfa and 40 lbs per acre triticale. Provide irrigation water to establish the crop before winter.

Years 8-11- Irrigate the land and harvest according to normal management procedures.

Measure production for bond release during Years 9, 10 and 11.

5.7.2 Fertilization Plan

Fertilizer will be used at the New Horizon Mine during reclamation based on good, economical land management practices on Irrigated Cropland post mine land use. It is important to note that fertility testing and fertilization of the soil will occur when the topsoil is initially placed, which is discussed as a soil preparation practice in Section 2.05.4(2)(d). To achieve goal of high management for the irrigated cropland areas, the following fertilization plan is proposed after the 1st year:

1) Sampling of the soil on land with Irrigated Cropland post mine land use will take place in years 3, 5, 7 and 9 after seeding.
2) Three soil samples will be taken over each of the IC areas and analyzed by a lab using the standard soil test for organic matter, nitrogen, potassium, and phosphorous. The lab will be informed that the desired crop is alfalfa and that the desired 1st cut production is 2.00 tons per acre.
3) The lab will produce a recommendation for fertilizer based on soil samples and the recommended production of alfalfa.
4) The fertilizer is in solid form and will be purchased in bulk from the local Co-Op. It will be applied by small tractor with a broadcast spreader pulled behind the tractor. The fertilizer will be applied in the Spring of the same year that each fertility testing is done.

5.7.3 Grazing Plan

The site may not be grazed in any year that the initial planting of the alfalfa seed mix occurs (Seed Mix #7). This is in Years 1 and 7. WFC will not graze domestic animals on the small Irrigated Cropland on its property but the Morgans are allowed to graze horses in the winter in years 2, 3, 4, 5, and 6. Horse grazing will only be allowed when the soils in the winter are hard and will not be damaged by the movement of the animals.

These management practices were discussed with Jim Boyd, of the local NRCS, and he felt they were acceptable.

5.7.4 Irrigation Management

WFC will manage the irrigation of the 3.96 acre parcel on the WFC property in the northwest corner of the permit. There will likely be a subcontractor actually performing the work.

The Morgan family and helpers designated by them will manage the irrigation and harvesting on their property.

On both properties, documentation will be provided to demonstrate that the required # of shares of water were applied to the property to achieve the desired production in the 1st cut.

6.0 Revegetation - Dryland Pasture (DP)

6.1 General Information

The reclaimed dryland pasture type will be established in areas which were previously sagebrush rangeland on the 1987 Travessitta-Pinon soils and on 1999 soil map units 98B, 98C, and 98H (see Map 2.04.9-1). It also will be established on former irrigated lands that do not have sufficient water for future irrigation. Although attempted in the past, irrigation will not be employed on dryland pasture.

Some dryland pastures will be restored such that, if water becomes available in the future, these lands could be irrigated after the liability period.

Seed Mix #8 is specifically designed for has been developed for dryland pasture on this permit area, to provide a mix of species that are compatible with the dryland pasture type, have a high level of utility, and will provide long term protection of the resource.

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~~**Dryland P**~~Some areas will be reclaimed to dryland pasture ~~Type~~where water is not sufficient for irrigation. ~~A~~Other areas reclaimed to the dryland pasture type occupy locations where the Pinon-Progresso loams complex (1987), soil map units 98C, 98B, and 98H (1999), and sagebrush vegetation types occurred prior to mining (see Section 2.04.9 and 2.04.10). Some of these reclaimed areas will have only received ~~associated~~ancillary disturbances during mining activities. The associated disturbance relates to topsoil removal for the location of roads, stockpiles, facilities, and regrading activities during reclamation. These areas were not flood irrigated prior to mining because of shallow soils, rock outcrops, and topography. Since these areas will remain basically unchanged in terms of topography, they will not be irrigated in the postmine land use ~~except as noted for vegetation establishment~~. The establishment of a dryland pasture type is consistent with both the pre- and postmining land uses in the area and best reflects that which is attainable under the expected site conditions and management potential.

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Any dryland pasture reclamation will involve drill seeding of a sterile hybrid annual triticale (Quickguard) in combination with Seed Mix #8. Quickguard will be planted either in the fall preceding a summer perennial planting or in the spring preceding a fall dormant seeding of the perennial species later the same year. The Quickguard application rate will be 20-25 lbs per acre. Seed mix #8 is the permanent seed mix for the dryland pasture. Seeding of dryland pasture will take place during either of the two time frames: 1) between July 15 and September 15, or 2) between October 25 and November 30 of any year after the topsoil has been replaced.

6.2 Seed Mix Information

Seed Mix #8 - Dryland Pasture

Species	Cultivar	Drilled Rate PLS/Acre**
Fairway Crested Wheatgrass	Ephriam	0.6
Thickspike wheatgrass	Critana	1.4
Russian Wildrye	Bozoisky	1.0
Alfalfa	Spreador 2	0.6
Western Wheatgrass	Arriba	1.6
Forage Kochia** (broadcast)	Immigrant	0.3
Fourwing Saltbush	Rincon	0.3
	Total	5.8

**Broadcast rate is doubled what would normally be used and is shown as such. Forage Kochia will only be applied through broadcast seeding therefore, its application rate is double that shown above.

Site Variation Adaptability of Seed Mix #8

Dry Sites:	All species.
Moist Sites:	Agropyron hybrid, Medicago.

Cool Season:	Agropyron, Elyrnus,.
Warm Season:	Medicago.
Fine Textured Sites:	Agropyron hybrid, Elyrnus, Medicago.
Coarse Textured Sites:	All species.

The Seed Mix #8 varieties are preferred but do not constitute the only available adapted varieties. Seed availability problems associated with the above recommended varieties will require that the next best adapted variety or native/common types be used. The alternate selections will be made from regional sources.

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Species selection criteria centered on species that are drought tolerant, reasonably productive under semi-arid conditions, able to provide site stabilization, able to withstand grazing pressure, and have utility for livestock and wildlife. The seed variety and mixture is commonly used in this region and was reviewed by the local Soil Conservation Service.

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For Permit Revision 06, forage kochia and fourwing saltbush have been added to the seed mix for those dryland pastureland areas west of 2700 Road. The shrubs in this mix will only be applied to the area west of 2700 Road. No shrubs were planted east of 2700 Road. Western Fuels has provided the notification letters sent to the landowners west of 2700 Road in Attachment 2.05.4(2)(e)-8. There is no letter from WFC, since they obviously approve the changes to the seed mix presented. The reasons for the addition of the 2 shrubs in the seed mix for dryland pasture are given below:

1) Both shrubs are very palatable to grazing animals, which is desirable for forage, which fits the use of dryland pasture.
2) The shrubs provide shade which allows the grasses to grow better around the shrubs, as was demonstrated in the AML reclamation work immediately north of the New Horizon #2 Mine.
3) The shade lessens the evapotranspiration which results in a better grass stand.
4) Better diversity in the field.

5) Since the shrubs grow taller, they should actually increase the forage in the field.

6) DRMS also concurs that these are good additions for the dryland pasture mix.

6.3 Dryland Pasture Seeding Procedures

Seeding will be done either with a cultipacker type seeder or a drill equipped with double-disk openers, depth bands, and packer wheels. A cultipacker may be used behind the drill to also firm the seedbed. Either of these two types of seeding equipment will provide the greatest level of success in terms of proper seed placement and firming of the soil around the seed. Seeding depths are usually about 1/4 inch deep for the species to be seeded, and never more than ½ inch deep. If it is determined that the drill seeding method is not desirable for a particular area, then a broadcast seeder will be utilized to distribute the grass seed onto the surface of the ground. A large tractor mounted broadcaster having the capacity of holding several bushels of grass seed will be used and the tractor will traverse the field such that overlapping of the seed will occur. After the seed is broadcasted, a spring tooth harrow will be drug over the field to bury the seed approximately 1/4 inch. Since not all of the seed will be covered, the seed rate will be increased 100% over the drilled seed rate. If the harrow is not utilized, such as in a topsoil stockpile situation, then the broadcast rate will be double the drilled rate.

6.4 Revegetation Success Criteria and Statistical Procedures - Dryland Pasture

Revegetation will be deemed adequate if vegetation cover and herbaceous production at the reclaimed site is at least 90% of the vegetative cover and herbaceous production at the reference area, in conformance with CDRMS Regulations 4.15.8. One of the three statistical comparison methods in CDRMS Regulations 4.15.11(2) subsections (a), (b), or (c) will be used, according to the procedures list in this Sub-section 6.4.

The production standard for the dryland pasture type for the New Horizon 2 (NH2) area will be based on a dryland reference area located at the Nucla Airport. This area was originally established in the summer of 2000 and augmented in 2005. The augmentation allows the reference area to be divided into two sections: one for rangeland and the other for dryland pasture. This Airport Dryland Reference (ADPR) area is shown in a map in Attachment 2.05.4(2)(e) - 4. The map shows the original sagebrush reference area, as well as the former rangeland reference area of 1999, which is no longer used. It also shows the reference area of

2000, which is no longer used. Adjacent to this area, and east of it, is the current reference area, which was established in 2005. Although this area can also be used as a reference area for rangeland, there is no restored rangeland that is planned in the mine reclamation for the New Horizon #2 Mine, as of October, 2009.

The Airport Dryland Reference area is located within the fenced boundaries of the Nucla Airport and is protected from domestic livestock grazing. Wildlife (deer, elk) winter grazing will still be allowed, as is on the NH2 reclaimed land. If the airport authorities allow domestic grazing, then WFC has an agreement with the airport authorities to fence off the three plus acre reference area so the vegetation will not be affected.

For Dryland Pasture areas, vegetation cover and herbaceous production will be measured at reclaimed sites and the reference area. Comparisons of the mean parameter values between the reclaimed areas and the reference area will be used to determine revegetation success, as described below. Vegetation cover will be measured as either canopy cover or basal cover of living herbaceous and woody vegetation, as defined by CDRMS Regulation 4.15.8(3)(b). Herbaceous production will be measured as current year above-ground biomass of herbaceous vegetation, as defined by CDRMS Regulation 4.15.8(4).

Vegetation sampling for measuring reclamation success will be conducted to ensure a repeatable and unbiased estimate of each vegetation population parameter. Measurements made on the reference area will be done in the same manner and season as measurements made on reclaimed lands, to ensure valid comparisons as specified in DRMS Regulation 4.15.11(1). Measurements will be made at a time during the May through September growing season.

Vegetation cover will be measured by a point intercept method that meets the provisions of DRMS Regulation 4.15.11(1)(a)(i). The observational unit will be a series of points along a transect at least 5 meters in length, and at least 50 data points at regular intervals along the transect. A point sampling device supported by a rigid frame will be used to ensure unbiased and vertical point placement.

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Herbaceous production will be measured by a quadrat sampling method that meets the provisions of ~~CDMG~~DRMS Regulation 4.15.11(1)(b)(i). The observational unit will be a rectangular or circular plot frame at least ¼ square meter and large enough to encompass individual plants of the larger species being sampled. Current year growth of herbaceous non-woody species will be clipped within each quadrat. The sampled plant material will be bagged and taken to the laboratory for drying and weighing. Samples will be oven-dried at 105 degrees C to a constant weight.
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Sampling points for cover and herbaceous production will be located by using a random number generating procedure to create up to 50 random coordinate pairs within each study area (reclaimed sites and the reference area). A geographic positioning system (GPS) unit will be used to navigate to the sample points, in the order that the points were randomly generated. A stake or quadrat frame will be thrown over the shoulder to determine the exact sample location. Cover transects will be oriented along a random compass bearing from the point of origin. If production sampling is done at the same time as cover sampling, quadrats will be placed at the transect origin on the left side of the transect. Cover will be calculated as percent total cover for each transect, and the mean calculated for the study area. Production will be calculated by dividing dry weight by the quadrat frame area in acres, and the mean dry weight pr acre calculated.

For a quality standard on Dryland Pasture, the following is proposed:

At least 75% of the relative production will be comprised of seeded species or species of comparable quality as livestock forage. County listed noxious weed species will not be counted towards the success standard for cover or production in any reclaimed area. For the purposes of this demonstration, a statistically adequate production sample will be taken, or a minimum of 30 observations.

The allowable relative cover and production contribution of annual and biennial species should not exceed 10%, or the relative cover and production of such species in the associated reference area or standard, whichever is higher. Annual or biennial cover or production in excess of this threshold should be deleted from the reclaimed area data prior to success comparison. An acceptable

alternative is to delete all annual/biennial cover and production from the reference area prior to success comparison.

Sample adequacy will be tested during field sampling using the formula in DRMS Regulation 4.15.11(2)(a), as follows:

$$n_m = \frac{t^2 s^2}{(d\bar{x})^2}$$

where:

n_m = minimum sample size

s^2 = Sample variance (n-1 degrees of freedom)

d = Precision (0.10 for cover and production; 0.15 for woody plant density)

$\bar{x}$ = Sample arithmetic mean

t = The ($\alpha = .10$) t-table value for a 1 tail t-test, n-1 degrees of freedom (infinite degrees of freedom may be used if $n > 30$)

n = Sample size

During field sampling for cover and production, at least 15 samples (observational units) will be made at each site. Sample adequacy will be tested after 15 samples are taken, using a field laptop computer. Sampling may continue if necessary to reach sample adequacy, or sampling may be terminated before sample adequacy is reached if an alternative statistical method (approved by DRMS) can be used that does note require demonstration of sample adequacy. Alternative procedures will require a minimum of 30 samples, as detailed below. Because dry-weight production data will not be available until samples are dried, sample adequacy will initially

be calculated on fresh weights of clipped material, then recalculated later for air-dried material and additional field samples will be taken if necessary.

Reclaimed area cover and production will be compared to a standard equal to the mean values measured at the reference area by sampling, as described below. Revegetation will be considered "successful" if the mean value for the reclaimed site can be demonstrated to equal or exceed "*Q*" (*Q*=90% of the standard). One of the following four methods will be used to compare mean values at reclaimed sites to *Q*, depending on the mean values and whether sample adequacy was reached during sampling.

1) If sample adequacy exists at the reclaimed site and the reference area, and the reclaimed site mean is equal to or greater than *Q*, no statistical comparison is necessary and revegetation at the reclaimed site will be deemed successful for the parameter in question. This complies with the provisions of DRMS Regulation 4.15.11(2)(a).

2) If sample adequacy exists at the reclaimed site and the reference area, and the mean value at the reclaimed site is less than *Q*, a "standard null" one-sided t-test with alpha error probability of 0.10 will be used, in conformance with DRMS Regulation 4.15.11(2)(b), using the general form of the one-sided t-test as follows:

$$t_c = \frac{Q - \bar{x}}{S_{\bar{x}}}$$

Where:

$\bar{x}$ = Bond Release Block Sample Mean
Q = 90% of Standard
$S_{\bar{x}}$ = Standard error of mean $[s/\sqrt{n}]$
S = Sample standard deviation
n = Sample size
t_c = Calculated t value
t_t = Table t value

The null hypothesis being tested is that the mean value at the reclaimed site is greater than or equal to *Q*, with 90% statistical confidence. If t_c is less than or equal to the 1-tailed t table value for alpha error probability of 0.10, at n-1 degrees of freedom (infinite degrees of freedom may be used if n > 30), then the null hypothesis is not rejected, and revegetation is deemed successful.

3) If sample adequacy is not achieved at the reclaimed site, but is achieved at the reference area, and the following 2 conditions are met: 1) a minimum of 30 samples were taken at the reclaimed site, and 2) mean production at the reclaimed site is greater than *Q*, a "reverse null" hypothesis will be tested using a one-sample one-sided t-test with alpha error probability of 0.20, in conformance with DRMS Regulation 4.15.11(2)(c). The following form of the t-test will be used :

$$t_c = \frac{\bar{x} - Q}{S_{\bar{x}}}$$

Where:

$\bar{x}$ = Bond Release Block Sample Mean
Q = 90% of Standard
$S_{\bar{x}}$ = Standard error of mean $[s/\sqrt{n}]$
S = Sample standard deviation
n = Sample size
t_c = Calculated t value
t_t = Table t value

The null hypothesis being tested is that the mean value at the reclaimed site is less than or equal to *Q*, with 80% statistical confidence. If t_c is greater than the 1-tailed t table value for alpha error probability of 0.20, at n-1 degrees of freedom (infinite degrees of freedom may be used if n > 30),

then the null hypothesis is rejected, and revegetation is deemed successful for the parameter in question.

4) If sample adequacy is not achieved in the reference area (regardless of whether sample adequacy is achieved in the reclaimed area), success will be demonstrated by use of the two-sample "reverse null" t-test with Satterthwaite approximation of standard error and degrees of freedom. The test can be used if the following 2 conditions are met: 1) a minimum of 30 sample observations are taken in the reclaimed area and also in the reference area, and 2) the reclaimed area sample mean is greater than *Q*.

To use this test, first the Satterthwaite standard error is calculated as

$$SE_{sat} = \sqrt{\frac{s_{br}^2}{n_{br}} + \frac{\left((0.9)s_{ref}\right)^2}{n_{ref}}}$$

Where:

SE_{sat} = Satterthwaite-approximated Standard Error

s_{br} = bond release site (reclaimed site) sample standard deviation

s_{ref} = reference area sample standard deviation

n_{br} = bond release site (reclaimed site) sample size

n_{ref} = reference area sample size

Next, the Satterthwaite degrees of freedom are calculated as

$$df_{sat} = \frac{\left(SE_{sat}\right)^4}{\left(\frac{\left(SE_{br}\right)^4}{n_{br}-1}\right) + \frac{\left((0.9)\left(SE_{ref}\right)\right)^4}{n_{ref}-1}}$$

Where:

df_{sat} = Satterthwaite-approximated degrees of freedom

Lastly, a one-sided reverse-null t-test with alpha = 0.20 is used as follows:

$$t = \frac{\overline{X}_{br} - \left((0.9)\overline{X}_{ref}\right)}{SE_{sat}}$$

Where:

t = calculated t-value

X_{br} = bond release site (reclaimed site) sample mean

X_{ref} = reference area sample mean

The null hypothesis being tested is that the mean value for the reclaimed site is less than or equal to Q. If the calculated t value is greater than the table t value (alpha = 0.20, df_{sat}), then the null hypothesis is rejected and revegetation is deemed successful for the parameter in question.

It is requested that the success standards for species diversity, shrub density and seasonal variety be waived for the dryland pasture type. The postmining land use for the New Horizon 2 area is ~~intensive agriculture~~pastureland, which is consistent with the pre-mining land use. This type will occur within the ~~i~~Reclaimed Irrigated ~~pasture~~Pastureland type. In addition, ranchers within the New Horizon 2 study area indicated a desire to replace the present areas containing sagebrush with a more productive community oriented towards livestock . The present sagebrush type (formerly sagebrush and pinyon-juniper dominated vegetation; see Attachment 2.04.10-7,(Peabody Addendum 10-3) is not being reclaimed because it is only a minor type reflecting a vegetative composition that has resulted in a stand dominated by increased and undesirable species. The present stands are not critical or unique habitat for wildlife, nor do they constitute any real wildlife value when one considers the extensive native vegetation in the immediate Nucla area and the habitat resulting from irrigation along with the large trees and shrubs in farmsteads

in the area. ~~During grazing rotations within the irrigated pasture types, there is the potential for periodic heavy concentrations of grazing animals.~~ The dryland pasture areas are composed of species that can withstand natural grazing pressure and continue to protect the resource. Seed Mix #8 has been designed to achieve this. The species present will supply forage during green-up periods early in the spring and later in the fall, though some use may be made during the summer. The productive and desirable forage species in the ~~irrigated~~dryland pasture will be used during the summer and fall months negating the need for seasonal variety in the dryland pasture type. Additionally, the presence of the productive and palatable species in the ~~i~~Reclaimed Irrigated ~~pasture~~Pastureland will concentrate animals there, reducing potential grazing impacts to the dryland pasture type. As discussed earlier, relatively simple mixes are more desirable for pasture than complex mixes.

6.5 Dryland Pasture - Liability Period Management

Dryland Pasture will be managed to much lower level than Reclaimed Irrigated Pasture. Initial fertilizer will be placed on all topsoiled areas prior to initial seeding, as described in Section 2.05.4(2)(d). No water will be applied to the areas after seeding.

6.5.1 Management Items

Management and maintenance activities will include any necessary repair of rills or gullies (detailed in Sub Section 8.0), reseeding, or grazing management. Grazing management will be centered on the proper use by livestock of the dryland pasture areas in relation to the associated Reclaimed Irrigated Pastureland. As described by the local NRCS specialist, interseeding of dryland pasture is a normal husbandry practice, therefore, it is allowed on these lands within the permit reclaimed area.

6.5.2 Fertilization Plan

It is important to note that fertility testing and fertilization of the soil will occur when the topsoil is initially placed, which is discussed as a soil preparation practice in Section 2.05.4(2)(d). To achieve goal of normal management for the irrigated cropland areas, the following fertilization plan is proposed after the 1st year:

1) Sampling of the soil on land with Dryland Pasture (DP) post mine land use will take place in years 3, 7 and 9 after seeding.
2) Three soil samples will be taken over each of the DP areas and analyzed by a lab using the standard soil test for organic matter, nitrogen, potassium, and phosphorous. The lab will be informed that the desired use is dryland pasture with a dry grass, forb and shrub mix.
3) The lab will produce a recommendation for fertilizer based on soil samples and the recommended production of alfalfa.
4) The fertilizer is in solid form and will be purchased in bulk from the local Co-Op. It will be applied by small tractor with a broadcast spreader pulled behind the tractor. The fertilizer will be applied in the Spring of the same year that each fertility testing is done.

6.5.3 Grazing Plan

No domestic grazing will be allowed on any dryland pasture areas.

These management practices were discussed with Jim Boyd, of the local NRCS, and he felt they were acceptable.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
Jim Boyd, Resource Conservationist
P. O. Box 29
Norwood, CO 81423

jim.boyd@co.usda.gov
970-327-4245-OFFICE
970-327-4247-FAX

July 11, 2006

Ross Gubka
Western Fuels Colorado
P.O. Box 628
Nucla, CO 81424

Dear Mr. Gubka:

Upon assessment of the dryland pastures at the Western Fuels Coal Mine near Nucla, Colorado, it is my professional judgment that it would be beneficial to interseed grasses and forbs into the existing vegetation using a no-till drill.

It can be very difficult to establish a dryland seeding in a low precipitation zone such as the Nucla area, which receives approximately 12 inches of precipitation per year. Therefore, it is a common husbandry practice to follow up the initial seeding with additional seeding in subsequent years in order to establish the intended plants in sufficient densities.

To preserve the plants that have become established, interseeding into the existing vegetation with a no-till drill is the best practice for accomplishing this; unless the first seeding was a complete failure, in which case it would be advantageous to prepare a good seedbed by disking and harrowing, and then replant.

It may take three to five years, multiple seeding, and some timely rains before a successful dryland seeding can become established.

If you have any further questions concerning my assessment of the reclaimed dryland pastures on the Western Fuels Coal Mine, please contact me.

Sincerely,

Jim Boyd

Jim Boyd, NRCS Resource Conservationist

7.0 Interim Revegetation Monitoring - ~~All Areas~~

~~**Areas which have been reclaimed and have entered into the bond liability period will be periodically monitored. During the liability period revegetated areas will be monitored at least twice. The first monitoring will be conducted during the second full growing season. The second monitoring will be conducted approximately mid-way through the liability period. A subsequent monitoring will be conducted during years 9 and 10 to assess post-mining land use success and to provide information necessary for**~~**Reclaimed irrigated Pastureland and Dryland Pasture**

For Reclaimed Irrigated Pastureland and Dryland Pasture, interim sampling will occur in Years 3 and 7. The Year 3 sampling will allow all parties to evaluate progress for a Phase 2 bond release. The Year 7 sampling will allow evaluation prior to final bond release. ~~Monitoring~~The interim monitoring is to provide the Division, the landowner and WFC the information needed to assess the progress and make any necessary adjustments, if needed. For the interim monitoring, a qualified professional will make assessment of the following items and provide the results in a report, which will be submitted to the landowner and the Division:

A) Assess species composition to determine the approximate % alfalfa, % weeds, % oats/barley, % annuals and % perennial grasses. This test will be done immediately prior to the 1st cut time frame.

B) Make a determination if the following condition is met: at least 75% of the relative production will be comprised of seeded species or species of comparable quality as livestock forage.

C) For Reclaimed Irrigated Pastureland, if the reclaimed area is harvested and if small bales are used (< 100 lbs.), a minimum of 15 samples will be randomly taken and weighed using a portable scale. No drying will be conducted. If the very large bales are used (>500 lbs.), a minimum of 6 bales will be randomly selected and weighed, by taking the bales on a truck for weighing at the truck scale at the local power plant or a nearby gravel pit. If none of these are available, a scale will be rented to conduct the weighing. The bale weights will be converted to a production per acre of the desirable species.

Final monitoring for bond release will occur in years 9 and 10. Final monitoring of Reclaimed Irrigated Pastureland Dryland Pasture will consist of evaluations to ~~document the various cover~~

~~components and productivity. Productivity will be measured from the reclaimed area sampled during mid-summer of the growing season to estimate the total annual production achieved. The methods employed for monitoring may be different from baseline sampling or that which will be used during bond release evaluations. In addition, statistical adequacy will be demonstrated so the information could be utilized for the various phases of bond release although statistical summaries will accompany any data submitted to the Division. Standards for sampling for bond release will be those Outlined in Guideline Regarding Selected Coal Mine Bond Release Issues, CDMG 1995.~~

meet all requirements in the success standards.

8.0 Regrading or Stabilizing Rills and Gullies - All Areas

After an area has been backfilled, graded, and topsoiled, Western Fuels Colorado will monitor the area following any heavy spring snow melt or heavy rains. If, upon observation, excessive rills and gullies do occur or there is an indication they may occur in areas that have been reclaimed, closer observation of the area will begin to determine, if possible, the cause of the gulling. The natural geomorphic processes of the reclaimed area will be given a great deal of consideration; taking into account the slope and climatic conditions of the site.

Monitoring for rills and gullies will be carried out on a periodic basis; the monitoring being geared to those periods after spring snow melt and following any significant storm events which may occur in the vicinity of the mine site. The results of any rill and gully monitoring will be documented in the administrative files located on site at the New Horizon mine office. Also contained in the files will be a map showing the location of those areas requiring repair. When the occurrence of excessive rills and gullies necessitates implementation of the following rill and gully plan, CDMG will be notified prior to any corrective action being taken.

After observation, WFC will have a few options to correct the situation. These options will be a direct result of studying the situation and selecting the option that, in the opinion of WFC, will rectify the erosional problem.

One of, or a combination of, the following options and corrective methods will be employed.

8.1 Improved Channel - If it is determined that the topography of the regraded area is such that drainage is concentrated in a particular area, then this area will be improved to accept the runoff. The drainage bottom or channel will be reshaped if needed. This will be done with either a motor grader or dozer, making the channel flatter and or wider. The channel bottom will either be seeded, covered with erosion matting and seeded, or rip-rapped with energy dissipating rocks. The method used will of course depend on site conditions. Continued observations will be made of this area for problems or necessary maintenance.

8.2 No Defined Channel - On slopes where no swale or defined channel exists, a number of operations will be performed, depending on the extent of the erosion. The area will be disced and

retopsoiled if needed. The site will then be mulched and crimped or erosion matting will be placed on the area, depending again on site specifics. Reseeding will then take place.

In addition to the above, contour furrows in and above the erosion area may be constructed to trap and slow down the runoff. Straw dikes will also be used where appropriate to control runoff and promote revegetation.

8.3 Other Methods If corrective measures described under No Defined Channel fail, WFC proposes to observe and reevaluate the situation. A combination of the first two methods described or some variation therein will be applied. Methods such as, but not limited to rock channels, contour furrows or laterals with rock or matting bottoms, V ditches made with the dozer or motor grader, and methods described above to reestablish vegetation.

8.4 Head Cutting Stabilization Head cutting will be controlled by a number of methods. If the area is at a point that concentrates runoff, the area will be improved to accept this runoff. This would include reshaping the channel and channel bottom, covering with erosion matting, seeding, or rocking.

In other areas, depending on the extent of erosion and time of year, the area will be disced, mulched and seeded as needed. Straw bales, erosion matting, or rock fill may also be used to stabilize the area.

9.0 Weed and Pest Control Plan - All Areas

A number of noxious weeds occur in the region surrounding the New Horizon Mine area. Specifically, the following noxious weeds (as listed in Section V, CDMG Guideline for the Management of Noxious Weeds on Coal Mine Permit Areas) were identified on the mine permit area during various baseline and monitoring studies:

Canada thistle
Jointed goatgrass

Musk thistle
Field bindweed
Russian knapweed
Hairy white top
Russian Olive*

* Russian Olive has been put onto the target for management by the San Miguel Basin Weed Advisory Commission.

Reclaimed areas or mine related associated disturbances such as roadsides and facilities will be monitored for noxious weed infestations. Monitoring will be conducted either through the formal revegetation monitoring program or as qualitative observations by WFC inspection teams. If noxious weed infestations occur at levels which may interfere with successful reclamation, or are detrimental to stand quality, weed control using herbicides will be implemented. A number of herbicides are available on the market at this time. The Colorado State University Cooperative Extension Service, or representative agent in Montrose County, will be contacted for recommendations as to specific herbicides and application rates for the targeted weeds. Recommendations specified on the herbicide label will also be strictly followed.

Herbicides will be applied either by contracted outside services or by WFC personnel. Outside services will consist of either the County Weed Control District resources or a private commercial herbicide applicator.

All applicators will be properly licensed and/or certified to apply restricted or general use herbicides as per Colorado statute and certification and licensing procedures administered through the Division of Plant Industry, Colorado Department of Agriculture.

Controlled areas will be monitored for effectiveness of the treatments. Follow-up treatments will be conducted as necessary. Because of the aggressiveness of certain weeds and other variables that may impact the effectiveness of the control program, monitoring for level of control and needed retreatment are critical aspects of the overall control program. Ongoing revegetation monitoring and qualitative observation of reclaimed areas by reclamation personnel will identify retreatment areas and any new areas of established weeds requiring control. The qualitative

monitoring will be conducted annually in order to evaluate progress being made towards control of identified noxious weed areas. This information will be provided to the Division by March 15 of each year as part of the Annual Reclamation Report. Finally, as new or improved methods of controlling noxious weeds through the use of herbicides (either existing or new products) become available, they will be evaluated for incorporation into the control program. In treatment areas where herbicidal control has been effective but the density of desirable perennial species is too low to reestablish an effective vegetative cover, the area will be reseeded using the approved permanent seed mix.

A record will be maintained of areas where herbicides are sprayed, the types and mixture of herbicides used, and the date of treatment. This information will be reported in the Annual Reclamation Report.

Gunnison's Prairie dog numbers in the Nucla area are great enough that colony extension into reclaimed areas is a real threat. Colony establishment in current fields is an ongoing problem for local operators, with the colonies causing significant damage to these fields. If the need for a prairie dog control plan develops, a detailed mitigation plan will be prepared in consultation with the CDMG and appropriate State and Federal wildlife agencies prior to implementation of any activities. Control of insect pests will follow the specifications and guidelines spelled out in the CSU Cooperative Extension Service's most current Colorado Pesticide Guide - Field Crops. Only registered chemicals specific to the intended use will be applied by a certified applicator with strict adherence to the requirements of the current label. Prior to implementation, pesticides to be used will be submitted to the Division for approval.

10.0 Annual Reporting

An annual reclamation report will be submitted by March 15 of each year, unless cessation requirements dictate otherwise, and will report those items required by 2.04.13(1). The following will also be included:

- Annual weed and pest control activities (when conducted)
- Revegetation monitoring reports
- Soil Fertility Testing reports and fertilizer application details
- Wildlife monitoring reports (when conducted)

~~**James Martin Land Use Change**~~

~~It has come to WFC's attention via the Colorado Cooperate Company (CCC) (the local irrigation water provider) that James Martin sold his remaining fifteen (15) shares of CCC ditch water in May of 1990 to another party. These fifteen shares were used to irrigate a portion of his fifty-four (54) acre parcel of pasture land. There has been no other irrigation water allocated to this parcel since this time according to CCC records . Especially since 1993, when WFC started operations in the immediate vicinity of the James Martin property. WFC has elected to reclaim the mine disturbance area on James Martin property back to dryland pasture. This will be a land use change from Irrigated Pasture to Dryland. See Exhibit 2.05.4-5 for location of James Martin Property.~~

~~**Literature Cited**~~

- The species, location and number of acres of vegetation planted that year, including any augmented seeding or cultural practices. Discrete areas planted with specific seed mixes should be indicated, and seedtags, invoices or other comparable documentation should be included (See Section 2.04.13(1)(e))

All post-mine topsoil testing and reporting is addressed in Section 2.05.4(2)(d).

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~~ATTACHMENT 2.05.4(2)(e)-1~~

~~NATURAL RESOURCE CONSERVATION SERVICE (NRCS)~~

~~SOIL INTERPRETATION RECORD~~

~~(FORM 5'S)~~

Attachment 2.05.4(2)(e)~~-A~~

~~**SUMMARY OF YIELDS FROM 1ST CUTTING***~~ **- 1**

Natural Resource Conservation Service (NRCs)

Soil Interpretation Record (Form 5's) & Soil Quality Designation Correspondence

(1)

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL INTERPRETATIONS RECORD

MLRA(S) 34, 35 39
STATE NEW MEXICO | RECORD NO. | AUTHOR(S) WSH | DATE 6-86 | REVISED | KIND OF UNIT SERIES | UNIT NAME PINON | UNIT MODIFIER COOL

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

THE PINON SERIES CONSISTS OF SHALLOW, WELL DRAINED SOILS FORMED IN RESIDUUM DERIVED FROM SANDSTONE ON MESAS, BENCHES, UPLAND HILLS, AND RIDGES. TYPICALLY, THE SURFACE LAYER IS LOAM ABOUT 5 INCHES THICK. THE UNDERLYING MATERIAL TO A DEPTH OF 16 INCHES IS LOAM. HARD SANDSTONE IS AT A DEPTH OF 16 INCHES. NAT. VEG. IS PINYON PINE AND UTAH JUNIPER, GRASSES, AND SHRUBS. ELEVATION IS 5,500 TO 7,400 FEET. FFS IS 90 TO 130 DAYS. AAP IS 10 TO 15 INCHES. AAAT IS 45 TO 47 DEGREES F. SLOPES ARE 1 TO 30 PERCENT.

STONE OR TEF UNDERLYING UTAH PINE AND TO 15 INCHES.

ESTIMATED SOIL PROPERTIES

DEPTH (IN)	USDA TEXTURE	UNIFIED	AASHO	FRACT. > 3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE				LIQUID LIMIT	PLASTICITY INDEX
					4	10	40	200		
0-5	L	CL-ML	A-4	0-5	90-100	85-100	70-95	50-75	25-35	5-10
0-5	SL	SM-SC, SC	A-2, A-4	0-5	90-100	85-100	50-70	25-40	20-30	5-10
5-16	L, GR-L	CL-ML, SM-SC, SC	A-4	0-10	80-100	70-100	60-95	40-75	25-35	5-10
16	UWB									

DEPTH (IN)	CLAY (PCT OF <2MM)	MOIST BULK DENSITY (G/CM³)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CORROSIVITY CONCRETE
SAME DEPTH AS ABOVE	18-27	1.25-1.35	0.6-2.0	0.12-0.14	7.4-8.4	—	LOW	.20	1	4L	1-3	MODERATE	LOW
	15-29	1.35-1.45	2.0-6.0	0.09-0.11	7.4-8.4	—	LOW	.17	1	3	1-3		
	18-29	1.25-1.35	0.6-2.0	0.11-0.13	7.9-8.4	<2	LOW	.15					

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
NONE			>6.0			—		10-20	HARD	—		D	LOW

SANITARY FACILITIES

FOOTNOTES

	KEYING ONLY		FOOTNOTES	CONSTRUCTION MATERIAL
SEPTIC TANK ABSORPTION FIELDS	FILL	191	ROADFILL	
SEWAGE LAGOONS	SAND	201	SAND	
SANITARY LANDFILL (TRENCH)	GRAVEL	211	GRAVEL	
SANITARY LANDFILL (AREA)	SOIL	221	TOPSOIL	

(2)

UNIT NAME PENON — RECREATIONAL DEVELOPMENT
UNIT MODIFIER. CARL

	FOOTNOTE	KEYING ONLY			FOOTNOTE
CAMP AREAS		PLAYGD	321	PLAYGROUNDS	
			2		
			3		
			4		
			5		
PICNIC AREAS		PATHS	321	PATHS AND TRAILS	
			2		
			3		
			4		
			5		

FOOTNOTE — CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CLASS-DETERMINING PHASE	CAPABILITY												
	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR
1-6 o/o	6S												
6-25 o/o	6E												
25+ o/o	7S												

FOOTNOTE — WOODLAND SUITABILITY

CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY	
		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	COMMON TREES	SITE INDEX
ALL	2D	MODERATE	MODERATE	MODERATE	SEVERE	MODERATE	PENYON POLE	75
							UTAH JUNIPER	

FOOTNOTE — WINDBREAKS

CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE					

FOOTNOTE — WILDLIFE HABITAT SUITABILITY

CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS								POTENTI	
	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLAND WILDLIFE	WOODL WILDL
1-25 o/o	POOR	POOR	POOR	—	V. POOR	FAIR	V. POOR	V. POOR	POOR	V. Po
25+ o/o	V. POOR	V. POOR	POOR	—	V. POOR	FAIR	V. POOR	V. POOR	V. Poor	V. Po

FOOTNOTE — POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION) A

COMMON PLANT NAME	PLANT SYMBOL (NLSPM)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS-DETERMINING PHASE	
		COOL	MOIST
MUTTONGRASS	POFE	15	
ELK SEDGE	CAGE2	10	
INDIAN RICEGRASS	ORHY	10	5
GAMBEL OAK	QUGA	15	
SASKATOON SERVICEBERRY	AMAL2	5	
TRUE MOUNTAIN MAHOGANY	CEMO2	5	
SALINA WILDRYE	ELSA		5
GALLETA	HIJA		15
WYOMING BIG SAGEBRUSH	ARTR		5
CHESSEED JUNIPER	JUMO	10	20
PENYAN	PIED	15	15

POTENTIAL PRODUCTION (LBS. AC. DRY WT.)

FAVORABLE YEARS	650	500
NORMAL YEARS	500	300
UNFAVORABLE YEARS	350	100

FOOTNOTES

STK
A MOIST = PENYAN JUNIPER IN SAN MIGUEL CO.

(ALBANY): 36, 49, 39, 34, 35
REV. LJM, 7-86
USTOLLIC HAPLARGIDS, FINE-LOAMY, MIXED, MESIC

PROGRESSO

THE PROGRESSO SERIES CONSISTS OF MODERATELY DEEP WELL DRAINED SOILS. THEY FORMED IN MATERIAL WEATHERED FROM SANDSTONE ELEVATION IS ABOUT 6400 FEET. MAP IS ABOUT 13 INCHES. MEAN ANNUAL AIR TEMPERATURE IS ABOUT 49 F. TYPICALLY, THE SURFACE LAYER IS DARK BROWN FINE SANDY LOAM ABOUT 6 INCHES THICK. THE SUBSOIL IS BROWN SANDY CLAY LOAM ABOUT 16 INCHES THICK. THE LOWER PART IS HIGH IN LIME. THE SUBSTRATUM IS WHITE SANDY LOAM ABOUT 10 INCHES THICK. SANDSTONE BEDROCK IS AT 32 INCHES. SLOPES ARE 1 TO 15 PERCENT.

ESTIMATED SOIL PROPERTIES

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3" (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
0-6	FSL	CL-ML	A-4	0	100	100	85-95	60-75	25-30	5-10
0-6	SL, FSL	SM-SC	A-4, A-2	0	100	100	60-85	30-50	20-30	5-10
6-10	FSL	SM-SC, CL-ML	A-4	0	100	100	70-85	40-55	25-30	5-10
10-22	SCL, CL	SC, CL	A-6	0	100	100	80-90	40-70	30-40	10-20
22-32	SL	SM-SC	A-4, A-2	0	100	100	60-70	30-40	20-25	5-10
>32	UNR									

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CONCRETE
0-6	15-25	1.40-1.50	0.6-2.0	0.13-0.17	6.6-7.8	-	LOW	1.37	2	5	.5-.9	HIGH	LOW
0-6	10-20	1.45-1.55	2.0-6.0	0.10-0.14	6.6-7.8	-	LOW	1.28	2	3	.5-.9		
6-10	13-20	1.45-1.55	2.0-6.0	0.13-0.15	6.6-7.8	-	LOW	1.28					
10-22	20-35	1.40-1.50	0.6-2.0	0.14-0.16	6.6-9.4	<2	MODERATE	.32					
22-32	13-18	1.45-1.55	2.0-6.0	0.10-0.13	7.9-8.4	<2	LOW	.24					
>32													

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	HYDROLOGIC GRP	FROST ACTION
NONE			>6.0			-		20-40	HARD	-		C	LOW

SANITARY FACILITIES

SEPTIC TANK ABSORPTION FIELDS	SEVERE-DEPTH TO ROCK
SEWAGE LAGOON AREAS	1-7%: SEVERE-SEEPAGE,DEPTH TO ROCK 7+%: SEVERE-SEEPAGE,DEPTH TO ROCK,SLOPE
SANITARY LANDFILL (TRENCH)	SEVERE-DEPTH TO ROCK
SANITARY LANDFILL (AREA)	1-8%: SLIGHT 8-15%: MODERATE-SLOPE
DAILY COVER FOR LANDFILL	POOR-DEPTH TO ROCK

CONSTRUCTION MATERIAL

ROADFILL	POOR-DEPTH TO ROCK
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	FAIR-DEPTH TO ROCK,TOO CLAYEY,THIN LAYER

WATER MANAGEMENT

POND RESERVOIR AREA	1-8%: SEVERE-SEEPAGE 8+%: SEVERE-SEEPAGE,SLOPE
EMBANKMENTS DIKES AND LEVEES	SEVERE-THIN LAYER
EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DRAINAGE	DEEP TO WATER
IRRIGATION	1-3% L: DEPTH TO ROCK 3+% L: SLOPE,DEPTH TO ROCK 1-3% SL,FSL: SOIL BLOWING,DEPTH TO ROCK 3+% SL,FSL: SLOPE,SOIL BLOWING,DEPTH TO ROCK
TERRACES AND DIVERSIONS	1-8% SL,FSL: DEPTH TO ROCK 8+% SL,FSL: SLOPE,DEPTH TO ROCK 1-8% L: DEPTH TO ROCK,ERODES EASILY 8+% L: SLOPE,DEPTH TO ROCK,ERODES EASILY
GRASSED WATERWAYS	1-8% SL,FSL: TOO ARID 8+% SL,FSL: TOO ARID,SLOPE 1-8% L: TOO ARID,ERODES EASILY 8+% L: TOO ARID,SLOPE,ERODES EASILY

BUILDING SITE DEVELOPMENT

SHALLOW EXCAVATIONS	SEVERE-DEPTH TO ROCK
DWELLINGS WITHOUT BASEMENTS	1-8%: MODERATE-SHRINK-SWELL,DEPTH TO ROCK 8-15%: MODERATE-SHRINK-SWELL,SLOPE, DEPTH TO ROCK
DWELLINGS WITH BASEMENTS	SEVERE-DEPTH TO ROCK
SMALL COMMERCIAL BUILDINGS	1-4%: MODERATE-SHRINK-SWELL,DEPTH TO ROCK 4-8%: MODERATE-SHRINK-SWELL,SLOPE, DEPTH TO ROCK 8+%: SEVERE-SLOPE
LOCAL ROADS AND STREETS	MODERATE-DEPTH TO ROCK,SHRINK-SWELL, LOW STRENGTH
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	1-8%: MODERATE-DEPTH TO ROCK 8-15%: MODERATE-SLOPE,DEPTH TO ROCK

REGIONAL INTERPRETATIONS

REV. 12-85
LITHIC TORRIORTHENTS, LOAMY, MIXED (CALCAREOUS), MESIC

TRAVESSILLA SERIES

TRAVESSILLA (1)

THE TRAVESSILLA SERIES CONSISTS OF SHALLOW AND VERY SHALLOW WELL DRAINED SOILS. THEY FORMED IN MATERIAL WEATHERED FROM SANDSTONE. ELEVATION IS ABOUT 5540 FEET. MEAN ANNUAL PRECIPITATION IS ABOUT 15 INCHES. MEAN ANNUAL AIR TEMPERATURE IS ABOUT 54°F., AND THE FROST-FREE SEASON IS ABOUT 150 DAYS. TYPICALLY, THE SOIL IS A SANDY LOAM AND LOAM WITH 0 TO 35 PERCENT ROCK FRAGMENTS ABOUT 8 INCHES DEEP OVER SANDSTONE BEDROCK. SLOPES RANGE FROM 0 TO 75 PERCENT.

ESTIMATED SOIL PROPERTIES

DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT >3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO. 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
0-4	SL, FSL	SM	A-2, A-4	0-5	85-100	80-100	50-80	25-40	15-25	NP-5
0-4	L	CL-ML	A-4	0-5	85-100	80-100	70-90	50-70	20-25	5-10
0-4	SCL, CL, GR-SL, GR-FSL	SM, SC, GM, GC, SM, SC	A-1, A-2, A-4	0-5	55-80	55-75	35-60	20-45	15-25	NP-10
4-8	L, CL-L, ST-L	CL-ML, GR-SC, SM-SC	A-4	0-20	50-80	50-75	50-75	35-55	20-25	5-10
8	BDRK									

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM3)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHO/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSIVITY STEEL	CORROSIVITY CONCRETE
0-4	5-15	1.35-1.45	2.0-6.0	0.11-0.13	6.6-8.4	-	LOW	.24	1	3	1-2	HIGH	LOW
0-4	10-18	1.35-1.45	0.6-2.0	0.16-0.16	6.6-8.4	-	LOW	.37	1	5	1-2		
0-4	5-19	1.35-1.45	0.6-2.0	0.13-0.15	6.6-8.4	-	LOW	.20	1	5	1-2		
4-8	10-18	1.35-1.45	0.6-2.0	0.13-0.15	6.6-8.4	<1	LOW	.20					
8													

FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INIT. (IN)	SUBSIDENCE TOTAL (IN)	WEI GRP	POTENTIAL FROST ACTION
NONE			>6.0					5-20	HARD			D	LOW

SANITARY FACILITIES

SEPTIC TANK ABSORPTION FIELDS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE
SEWAGE LAGOON AREAS	0-7%: SEVERE-DEPTH TO ROCK 7+%: SEVERE-DEPTH TO ROCK, SLOPE
SANITARY LANDFILL (TRENCH)	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE
SANITARY LANDFILL (AREA)	0-8%: SLIGHT 8-15%: MODERATE-SLOPE 15+%: SEVERE-SLOPE
DAILY COVER FOR LANDFILL	0-15%: POOR-DEPTH TO ROCK 15+%: POOR-DEPTH TO ROCK, SLOPE

BUILDING SITE DEVELOPMENT

SHALLOW EXCAVATIONS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK, SLOPE

CONSTRUCTION MATERIAL

ROADFILL	0-25%: POOR-DEPTH TO ROCK 25+%: POOR-DEPTH TO ROCK, SLOPE
SAND	IMPROBABLE-EXCESS FINES
GRAVEL	IMPROBABLE-EXCESS FINES
TOPSOIL	0-15%: POOR-DEPTH TO ROCK, SMALL STONES 15+%: POOR-DEPTH TO ROCK, SMALL STONES, SLOPE

WATER MANAGEMENT

POND RESERVOIR AREA	0-8%: SEVERE-DEPTH TO ROCK 8+%: SEVERE-DEPTH TO ROCK, SLOPE
EMBANKMENTS DIKES AND LEVEES	SEVERE-THIN LAYER

1 NOT USUALLY UTILIZED BY CATTLE, SHEEP OR HORSES.
2 NOT USUALLY UTILIZED BY CATTLE.

TRAVESILLA (2)

DWELLINGS WITHOUT BASEMENTS	0-15%: SEVERE DEPTH TO ROCK 15+%: SEVERE-SLOPE-DEPTH TO ROCK	EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DWELLINGS WITH BASEMENTS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK,SLOPE	DRAINAGE	DEEP TO WATER
SMALL COMMERCIAL BUILDINGS	0-6%: SEVERE-DEPTH TO ROCK 6+%: SEVERE-SLOPE,DEPTH TO ROCK	IRRIGATION	0-3% L,CN-L,CH-L,CH-SL,GR-FSL: DEPTH TO ROCK 3+% L,CN-L,CH-SL,GR-FSL: SLOPE,DEPTH TO ROCK 0-3% SL,FSL: SOIL BLOWING,DEPTH TO ROCK 3+% SL,FSL: SLOPE,SOIL BLOWING,DEPTH TO ROCK
LOCAL ROADS AND STREETS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-DEPTH TO ROCK,SLOPE	TERRACES AND DIVERSIONS	0-8% SL,FSL,CN-L,CN-SL,GR-FSL: DEPTH TO ROCK 8+% SL,FSL,CN-L,CN-SL,GR-FSL: SLOPE, DEPTH TO ROCK 0-8% L: DEPTH TO ROCK,ERODES EASILY 8+% L: SLOPE,DEPTH TO ROCK,ERODES EASILY
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-SLOPE,DEPTH-TO-ROCK	GRASSED WATERWAYS	0-8% SL,FSL,SIL-L,CN-SL,GR-FSL: TOO ARID 8+% SL,FSL,CN-L,CN-SL,GR-FSL: TOO ARID,SLOPE 0-8% L: TOO ARID,ERODES EASILY 8+% L: TOO ARID,SLOPE,ERODES EASILY

PERTURAL INTERPRETATIONS

TRAVESSILLA (3)

RECREATIONAL DEVELOPMENT

CAMP AREAS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-SLOPE,DEPTH TO ROCK	PLAYGROUNDS	0-6% SL,FSL,L: SEVERE-DEPTH TO ROCK 6+% SL,FSL,L: SEVERE-SLOPE,DEPTH TO ROCK 0-6%: SEVERE-SMALL STONES,DEPTH TO ROCK 6+%: SEVERE-SLOPE,SMALL STONES,DEPTH TO ROCK
PICNIC AREAS	0-15%: SEVERE-DEPTH TO ROCK 15+%: SEVERE-SLOPE,DEPTH TO ROCK	PATHS AND TRAILS	0-15% SL,FSL,CN-L,CN-SL,GR-FSL: SLIGHT 15-25% SL,FSL,CN-L,CN-SL,GR-FSL: MODERATE 25+% SL,FSL,CN-L,CN-SL,GR-FSL: SEVERE-SLOPE 0-25% L: SEVERE-ERODES EASILY 25+% L: SEVERE-SLOPE,ERODES EASILY

CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CLASS-DETERMINING PHASE	CAPABILITY	NIRR	IRR	NIRR	IRR	NIRR	IRR	NIRR	IRR	NIRR	IRR	NIRR	IRR	NIRR	IRR	NIRR	IRR
0-15%	7																
15+	7																

WOODLAND SUITABILITY

CLASS-DETERMINING PHASE	SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDL. MORTALITY	WINDTH HAZARD	PLANT COMPET	POTENTIAL PRODUCTIVITY: COMMON TREES	SITE INDEX	PROD CLASS	TREES TO PLANT
SMDO-15	10	SLIGHT	SLIGHT	SEVERE	SEVERE	SLIGHT	ONESEED JUNIPER PINYON	20	1	-
SMD15-35	10	MODER.	MODER.	SEVERE	SEVERE	SLIGHT	ONESEED JUNIPER PINYON	20	1	-
SMD35-65	10	SEVERE	SEVERE	SEVERE	SEVERE	SLIGHT	ONESEED JUNIPER PINYON	19	1	-
MED-PPT										

WINDBREAKS

CLASS-DETERMINING PHASE	SPECIES	WT	SPECIES	WT	SPECIES	WT	SPECIES	WT
	NONE							

WILDLIFE HABITAT SUITABILITY

CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS-LEGUME	WILD HERB	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	POTENTIAL AS HABITAT FOR: SHALLOW WATER WILDLF	OPENLD WILDLF	WOODLD WILDLF	WETLAND WILDLF	RANGELD WILDLF
0-75% MED PPT	V. POOR V. POOR	V. POOR V. POOR	POOR POOR	- -	- POOR	FAIR FAIR	V. POOR V. POOR	V. POOR V. POOR	V. POOR V. POOR	- POOR	V. POOR V. POOR	FAIR -

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

COMMON PLANT NAME	PLANT SYMBOL (CALSCAL)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE: MOIST	WARM	DRY	COOL	WET
LITTLE BLUESTEM	SCSC	15	15	20	15	15
SIDEOATS GRAMA	BOCU	25	15	20	15	15
BLUE GRAMA	BOGR2	15	15		10	10
HAIRY GRAMA	BOHI2	-		15		
BIG BLUESTEM	ANGE	5				
SAND BLUESTEM	ANHA	-	10	-	-	-
OTHER ANNUAL FORBS	AFF	-	10	10	5	5
PLAINS LOVEGRASS	ERIN				5	5
PINYON	PILO			5	5	5
ROCKY MTN JUNIPER	JUSC2	5		5	5	5
NEW MEXICO FEATHERGRASS	STNE2	10	10		10	5
BLACK GRAMA	BOER4		10		10	15
OTHER SHRUBS	SHRUB	15	5	5	10	10
GAMBLE OAK	QUGA			5		
OTHER PERENNIAL GRASSES	PERG	10	10	15	10	10
POTENTIAL PRODUCTION (LBS./AC. DRY WT):						
FAVORABLE YEARS		1100	1000	1200	1500	1000
NORMAL YEARS		-	-	800	1000	600
UNFAVORABLE YEARS		300	400	600	600	400

FOOTNOTES

A PLANT SITE: MOIST, 07X400SNI; WARM, 070A072NI; DRY, 070A000NI; COOL 070C116NI WET, 070C117N.

Attachment 2.05.4(2)(e) - 2

Summary of Yields from 1st *Cutting*

IRRIGATED ALFALFA HAYLAND	**1987**	**1999**
Mr. Frank Morgan	2.00 tons/acre	1.91tons/acre
Mr. Mel Staats		1.77 -
Mr. Zene Weimer	1.75	-
Mr. Johnson		2.08

Average 1.84 tons/acre = 3,680 lbs/ac (first cut only) (1987)
2.00 tons/acre = 3.990 lbs/ac (first cut only) (1999)

~~IRRIGATED PASTURE~~Reclaimed Irrigated Pastureland AND IRRIGATED GRASS HAY

Mr. Frank Morgan	N/A tons/acre
Mr. Mel Staats	1.50
Mr. Zene Weimer	1.50

Average 1.50 tons/acre = 3,000 lbs/ac (first cut only)
2.09 tons/acre = 4185 lbs/ac (clipped - 1999)

* Yields based on farmer estimates

~~ATTACHMENT~~

Attachment 2.05.4(2)(~~E~~e)-~~A~~3

~~ESTIMATED YIELDS~~Estimated Yields

~~FARMER LETTERS~~Farmer Letters

NRCS ~~LETTER~~Letter

Date: 6/19/98

To Whom It May Concern:

I have been asked by Western Fuels-Colorado, New Horizon Mine, what production yields (first cutting only) I have been achieving off of my grass fields. I will answer this question by stating that I have been farming in the Nucla-Naturita area for the last 40+ years. During this time, I have experienced many dry growing seasons, and many wet seasons so my production figures are based upon what I feel would be a good overall average. Listed below are my estimates for the different fields I have been asked to report on.

I) Irrigated Alfalfa Hayland: 1.77 tons/acre (first cutting)

II) Irrigated Pasture and Irrigated Grass Hay: 1.50 tons/acre (first cutting)

I hope this information can be put to good use.

Sincerely,

Mark W Staats

The above estimates tend to be on the upper end of production when water/irrigation is good with adequate crop cover.

Date: 6/8/98

To Whom It May Concern:

I have been asked by Western Fuels-Colorado, New Horizon Mine, what production yields (first cutting only) I have been achieving off of my [redacted] fields. I will answer this question by stating that I have been farming in the Nucla-Naturita area for the last _____ years. During this time, I have experienced many dry growing seasons and many wet seasons so my production figures are based upon what I feel would be a good overall average. Listed below are my estimates for the different fields I have been asked to report on.

I) Irrigated Alfalfa Hayland: 2 tons/acre (first cutting)

II) Irrigated Pasture and Irrigated Grass Hay: N.A. tons/acre (first cutting)

I hope this information can be put to good use.

Sincerely,

Frank E Morgan

Date: 5/28/98

To Whom It May Concern:

I have been asked by Western Fuels-Colorado, New Horizon Mine, what production yields (first cutting only) I have been achieving off of my grass fields. I will answer this question by stating that I have been farming in the Nucla-Naturita area for the last 90 years. During this time, I have experienced many dry growing seasons and many wet seasons so my production figures are based upon what I feel would be a good overall average. Listed below are my estimates for the different fields I have been asked to report on.

I) Irrigated Alfalfa Hayland: 1.750 tons/acre (first cutting)

II) Irrigated Pasture and Irrigated Grass Hay: 1.500 tons/acre (first cutting)

I hope this information can be put to good use.

Sincerely,

Werner Ranches
Jane F Werner

UNITED STATES
DEPARTMENT OF
AGRICULTURE

NATURAL
RESOURCES
CONSERVATION
SERVICE

102 Par Place
Suite 104
Montrose, CO 81401
(970) 249-8407

June 24, 1998

JUN 25 1998

Ross Gubka
Western Fuels - Colorado
P.O. Box 628
Nucla, CO 81424

Ross:

I have reviewed the information on alfalfa and grass hay yields in the Nucla that you have obtained by surveying hay growers in that area. The 1.75 to 2 tons/acre alfalfa and 1.5 tons/acre grass (first cut) generally match my experience working with agricultural producers in this area and also generally match potential yields identified in the San Miguel Area Soil Survey for irrigated soils in the Nucla area.

Please let me know if I can be of further assistance.

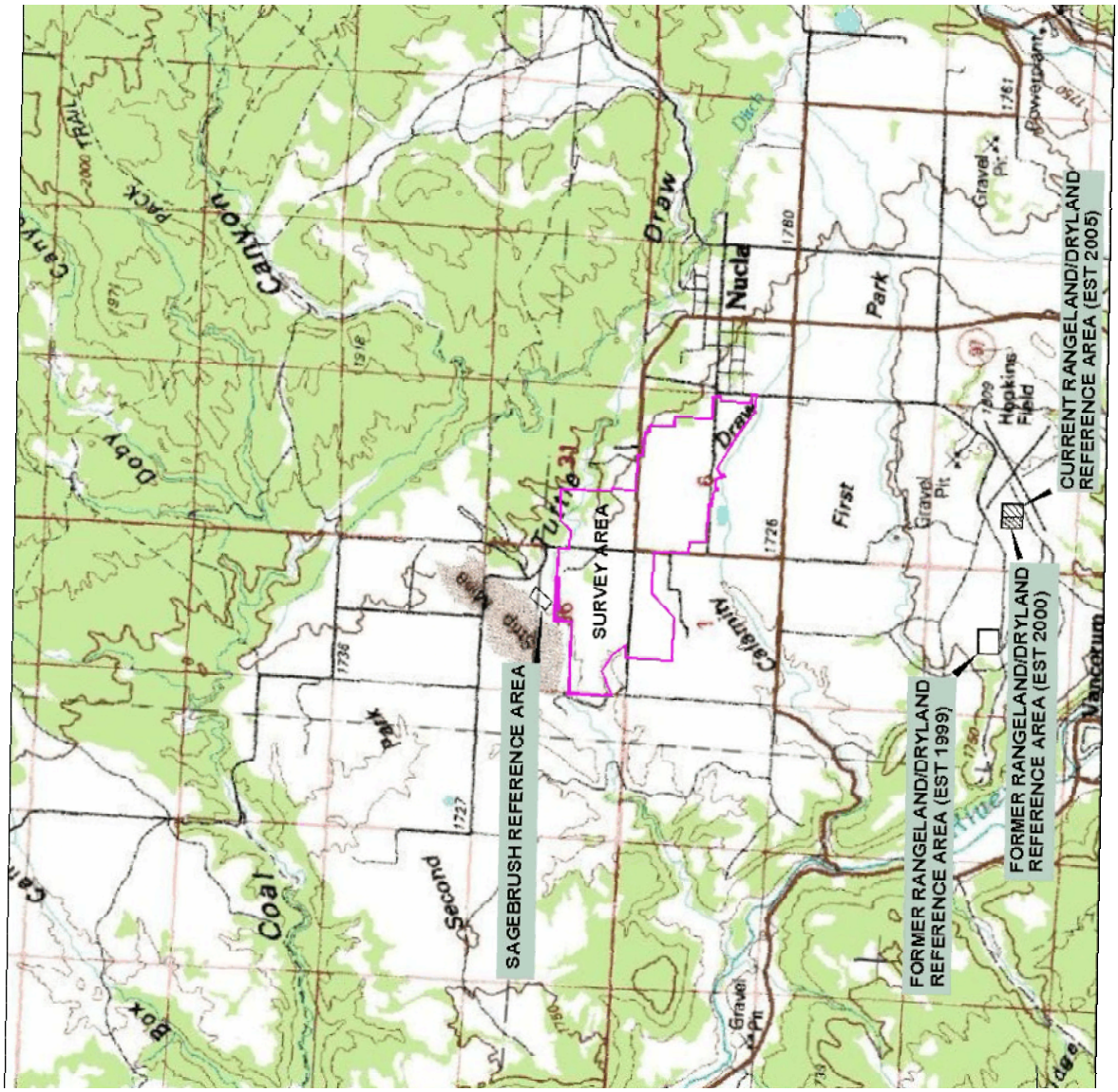
Sincerely,

Dean R. Stindt
Resource Conservationist

Attachment 2.05.4(2)(e) - ~~2~~4

Location Map of Reference Areas and

Airport Reference Areas Agreement


SAGEBRUSH REFERENCE AREA
SURVEY AREA
FORMER RANGELAND/DRYLAND REFERENCE AREA (EST 1999)
FORMER RANGELAND/DRYLAND REFERENCE AREA (EST 2000)
CURRENT RANGELAND/DRYLAND REFERENCE AREA (EST 2005)
Canyon
Draw
Nucla
Park
First
Second
Coal
Box
Doby
Calamity
Hopkins Field
Gravel Pit
Powerplant
Ditch
Vancorum

Montrose Regional Airport

2100 Airport Road • Montrose, CO 81401 • (970) 249-3203 • FAX (970) 249-2808

October 3, 2000

Mr. Ross L. Gubka, Chief Engineer
Western Fuels – Colorado, New Horizon Mine
P.O. Box 628
Nucla, CO 81424

Dear Ross:

Enclosed please find two (2) original copies of the Land Lease Agreement for the vegetation reference area located within the boundaries of the Nucla Airport (Hopkins Field). Please sign both copies where indicated, keeping one copy for your file and returning one copy back to my attention. Also enclosed is your original request, signed by our Interim County Manager, Mary Sawicki.

If you have any questions, please feel free to contact me. Thank you.

Sincerely,

Rhonda J. Mead

Rhonda J. Mead
Office Administrator

RJM/
enc.

August 1, 2000

Western Fuels-Colorado
P.O. Box 628
Nucla, Colorado 81424

Telephone 970/864-2165
Fax 970/864-2168

Mr. Leo Large
Montrose County Commissioner
P.O. Box 1289
Montrose, Colorado 81402

RE: VEGETATION REFERENCE AREA LOCATE WITHIN THE BOUNDARIES OF THE MONTROSE COUNTY AIRPORT LOCATED IN NUCLA COLORADO.

Dear Leo:

Western Fuels-Colorado, New Horizon Mine is requesting permission from Montrose County to use a tract of land located within the Nucla Airport fence line of approximately four (4) acres in size, for a vegetation reference area. The Colorado Division of Minerals and Geology requires all surface mines to have vegetation reference areas to gauge the reclamation success on mined lands. WFC has scouted the surrounding area of Nucla and have found a parcel of land on the western limits of the airport property that has similar vegetation cover and density as we are reclaiming. What makes this parcel even more attractive is the vegetation diversity, maturity and cover density. The vegetation is also protected from domestic livestock grazing. A very rare event in this are. WFC is asking for permission to enter the property, with proper notification , and performing the necessary study. Each study would take approximately two days, and would not effect or damage the vegetation. WFC has no intension of building any structures at this site but would like to reserve the right to construct a simple protective barb wire fence around the designated study area if the airport management ever decides to graze the area with domestic livestock.

If you agree with our request, please sign and date on the line below so both of us will have a record of this correspondence.. I might add, that WFC must also get permission from the Division of

Minerals and Geology to use this area as a reference area. They will review our site proposal and hopefully grant our request as well. With yours and the Divisions approval, New Horizon Mine is anticipating conducting a vegetation study this September in the airport reference area. This study will assist us in getting partial Reclamation Bond Release in the Second Park reclamation area.

Thank you for your time and consideration. Please call me if you have further questions.

Sincerely,

Ross L. Gubka, P.E.
Chief Engineer

Name Interim County Manager 8/24/00 Date

LAND LEASE AGREEMENT

THIS LEASE made and entered this 18th day of September, between **MONTROSE COUNTY, COLORADO**, hereinafter referred to as the "Lessor", and, **WESTERN FUELS-COLORADO, NEW HORIZON MINE**, hereinafter referred to as the "Lessee."

WHEREAS, Lessor is owner and operator of Hopkins Field - Nucla, together with the land on which said airport is located in the County of Montrose, State of Colorado, hereinafter referred to as the "Airport"; and

WHEREAS, Lessee is desirous of leasing from Lessor a parcel of land, said parcel being approximately four acres in size and located within the western limits of the Airport, for the purpose of a vegetation reference area;

NOW THEREFORE in consideration of the payments, covenants, and agreements herein set forth, the parties mutually agree as follows:

1. Premises

The Lessor hereby leases unto the Lessee for the term and upon the rental conditions herein, the real property on the Airport, as more specifically described on the attached Exhibit A, incorporated herein by this reference, and hereinafter referred to as the "Premises". The Premises consists of four (4) acres of land owned by Lessor. Lessee shall also have the non-exclusive right of access to and from the Premises over and across the Airport property in specifically designated areas, said access not to interfere with any aircraft activity.

2. Term and Options

The Lessor hereby leases the Premises unto the Lessee for a period of two (2) to five (5) days per year over the life of the mine (approximately 15 years). The Lessee shall notify the Lessor not less than five (5) business days prior to beginning each study session.

3. Rent

There shall be a zero dollar ($0.00) rental assessment for the specified use of Premises.

4. Improvement and Use

4.1 Use of Premises
The Premises shall be utilized by the Lessee as a vegetation reference area to gauge the reclamation success on mined lands. Lessee shall have no right to utilize said Premises, or any improvements thereon, other than as specifically allowed under this paragraph.

4.2 Lessee shall, with the written approval of the County, be allowed to construct a simple protective barb wire fence around the designated study area were the County to grant livestock grazing rights in the area.

5. Maintenance Obligations

Lessee, at its expense, shall keep said Premises and any improvements thereon in good repair and maintain the same in a safe, sanitary, orderly, and sightly condition.

6. Signs

Lessee shall not erect, paint, or maintain any signs whatsoever upon the Premises without first securing the written consent of the Lessor. Any such signs shall comply with all regulations of the Airport and any standards which might be developed through the Montrose Regional Airport Rules and Regulations.

7. Lessor's Right of Access

The Lessor reserves and retains for its officials, employees, and representatives the right to periodically access the Premises for the purpose of inspecting and protecting the Premises and for the purpose of repairing, installing, replacing, or maintaining any and all Airport utility lines on or under said Premises.

8. Indemnification

Lessee assumes the risk of loss or damage to any improvements or personal property on the Premises, whether from natural causes or any other causes. Lessee agrees to indemnify and hold harmless Lessor, its officials, employees, and insurers from and against all liability, costs, attorneys' fees, and claims whatsoever, which, directly or indirectly result from Lessee's use of the Premises. The obligation of this Section shall not extend to injury, loss or damage caused by the negligence of the Lessor, its officials, or its employees.

9. Insurance

Lessee shall maintain an adequate comprehensive general liability insurance policy, and shall submit certification of such policy to the Lessor upon the execution of this lease. Such insurance policy shall, throughout the duration of this Lease, provide a minimum coverage of not less than $600,000. Lessee shall name the Lessor as an additional insured on such insurance policy, and provide a valid endorsement that such policy may not be canceled, terminated, changed, or modified without ten days written notice to the Lessor.

10. Surrender

Lessee covenants and warrants that at the expiration, termination, or cancellation of the Lease, Lessee will quit and surrender said Premises in a good state and condition, reasonable wear and tear excepted. Lessee further covenants and warrants that all improvements, installed, erected, attached, or placed by Lessee in, on or about said Premises under the terms of this Lease shall be removed by Lessor. The Lessor shall have the right on such expiration, termination, or cancellation to enter upon and take possession of said Premises, with or without process of law, without liability for trespass.

11. Inconvenience During Construction

Lessee recognizes that from time to time during the term of this Lease it may be necessary for the Airport to initiate and carry forward extensive programs of construction, reconstruction, expansion, maintenance and repair in order that the Airport may be suitable for air traffic and flight activity. Lessee agrees that no liability shall attach to the Lessor, its officials, agents, employees, contractors, subcontractors and representatives by reason of such temporary inconvenience or interruption, and waives any right to claim damages or other consideration thereof. This waiver shall not extend to, nor be construed to be a waiver of, any claim for physical damage to property resulting from negligence or willful misconduct by the Lessor.

12. Assignments

This Lease is not assignable by Lessee.

13. Agreements with United States

This Lease is subject and subordinate to all existing or future terms, reservations, regulations, restrictions, provisions, conditions, and statutes of the United States, and any existing or future agreements between the Airport and the United States, relative to the operation or maintenance of the Airport and its appurtenant facilities.

14. Notice

Any notice to be given under this Lease shall be served by certified mail, return receipt required, and directed to the other party at the address herein noted. When so given, the date of notice shall be effective from the date of mailing. Lessee shall be responsible for notifying Lessor of any change of mailing address. Unless otherwise noted the address of the Lessor shall be: Airport Administration, 2100 Airport Road, Montrose, CO 81401. The address of the Lessee shall be: P.O. Box 628, Nucla, CO 81424.

15. Airport Rules and Regulations

In addition to all other provisions of this Lease, Lessee agrees to comply with the *Montrose Regional Airport Minimum Standards*, as such may be amended or adopted from time to time.

16. F.A.A. Lease Requirements

16.1 The Lessor reserves the right to further develop or improve the landing area of the Airport as it sees fit, regardless of the desires or views of Lessee, and without interference or hindrance.

16.2 The Lessor reserves the right to, but shall not be obligated to Lessee to maintain and keep in repair, the landing area of the Airport and all publicly owned facilities of the Airport, together with the right to direct and control all activities of Lessee in this regard.

16.3 This Lease shall be subordinate to the provisions and requirements of any existing or future agreement between the Airport and the United States, relative to the development, operation, or maintenance of the Airport.

16.4 Lessee agrees to comply with the notification and review requirements covered in Part 77 of the Federal Aviation Regulations in the event any additional future structure is placed on the Premises, or in the event of any modification or alteration of any present or future improvement on the Premises.

16.5 It is understood and agreed that nothing contained in this Lease shall be construed to grant or authorize the granting of an exclusive right within the meaning of Section 308 of the Federal Aviation Act.

16.6 There is hereby reserved to the Lessor, its successors and assigns, for the use and benefit of the public, a right of flight for the passage of aircraft in the airspace above the surface of the Premises, together with the right to cause in said airspace such noise as may be inherent in the operation of aircraft now known or hereafter used for navigation or flight in the air, using said airspace for landing at, taking off from or operating on the Airport.

16.7 Lessee expressly agrees for himself, his successors and assigns that Lessee will not make use of the Premises in any manner which might interfere with the landing and taking off of aircraft from the Airport or otherwise constitute a hazard to aviation. In the event the aforesaid covenant is breached, the Lessor reserves the right to enter upon the Premises and cause the abatement of such interference at the expense of the Lessee.

17. Hazardous Materials

17.1 For the Lease, the term "Hazardous Materials" means any hazardous or toxic substance, material or waste which is or becomes regulated by any federal, state, political subdivision, or local government entity or agency. The term "Hazardous Material" includes, without limitation, any material or substance that is (i) defined as a "hazardous substance" under Colorado law, (ii) petroleum, (iii) asbestos, (iv) designated as a "hazardous substance" pursuant to Section 311 of the Federal Water Pollution Control Act (33 U.S.C. §1321), (v) defined as a "hazardous waste" pursuant to Section 1004 of the Federal Resource Conservation and Recovery Act (42 U.S.C. §6903), (vi) defined as a "hazardous substance" pursuant to Section 101 of the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. §9601), or (vii) defined as a "regulated substance" pursuant to Subchapter IX, Solid Waste Disposal Act (Regulation of Underground Storage Tanks) (42 U.S.C. §6991).

17.2 The Lessee shall not cause or permit the use, storage, placement or release of any Hazardous Material on or about the Premises by the Lessee, Lessee's agents, employees, contractors, subcontractors, subtenants, or invitee, without the prior written consent of the City's Fire Chief, or designee, and the County. If the Lessee breaches an obligation of the preceding sentence, then the Lessee shall indemnify, defend and hold the Lessor harmless from all claims, judgements, penalties, fines, costs, liabilities or losses (including, without limitation, diminution in value of the Premises, damages for the loss or restriction on use of the Premises or of any amenity of the Premises, sums paid in settlement of claims, attorneys' fees, consultants' fees and experts' fees) which arise during or after the Lease term as a result of such contamination. This indemnification of the Lessor by the Lessee includes, without limitation, all costs the Lessor incurs with any investigation of site condition or any cleanup, remediation, removal, or restoration work any federal, state, political subdivision, or local government entity or agency requires because of Hazardous Material present in the soil or groundwater on or under the Premise. Without limiting the above, if the Lessee permits the presence of any Hazardous Material that results in any contamination of the Premises, the Lessee shall promptly take all action, at Lessee's sole expense, necessary to return the Premises to the condition existing before the introduction of any such Hazardous Material.

18. Miscellaneous

18.1 No waiver of default by the Lessor of any of the terms, covenants, warranties or conditions hereof to be performed, kept or observed by Lessee shall be construed as, or operate as, a waiver of the County of any of the terms, covenants, warranties or conditions herein contained, to be performed, kept or observed by Lessee.

18.2 Lessee agrees that the Lessor shall be under no obligation of any kind or nature whatsoever to maintain the Airport in any particular condition, and Lessee hereby agrees that he waives all claims for damages of any kind or nature resulting from this use.

18.3 Article and section headings shall not be deemed to govern, limit, modify or in any manner affect the scope, meaning or intent of the provisions of this Lease.

18.4 The provisions of the Lease shall be construed as to their fair meaning, and not for or against any party based upon any attributes to such party of the source of the language in question.

18.5 The Lessee shall perform all terms and conditions of the Lease in strict compliance with all applicable laws, rules, charters, ordinances and regulations, as now exist or are later enacted or amended, of the Lessor- except any future ordinances or regulations adjusting or establishing lease rates - and all county, state and federal entities having jurisdiction over the Airport, the Premises, or the Lessee's operations.

18.6 No representations, warranties, or certifications, express or implied, shall exist as between the parties, except as specifically stated in the Lease.

18.7 None of the terms, conditions or covenants in the Lease shall give or allow any claim, benefit, or right of action by any third person not a party hereto. Any person other than the Lessor or the Lessee receiving services or benefits under the Lease shall be only an incidental beneficiary.

18.8 The Lease is an integration of the entire understanding of the parties with respect to the matters stated herein. The parties shall only amend the Lease in writing with the proper official signatures attached thereto.

18.9 Invalidation of any specific provision of the Lease shall not affect the validity of any other provision of the Lease.

18.10 The Lease shall be governed and construed according to the laws of the State of Colorado.

18.11 This Lease shall extend to and be binding upon the heirs, successors, and assigns of the parties.

IN WITNESS WHEREOF, the parties have hereunto set their hands on the day and year first above written.

Approved this 2nd day of Oct., 2000.

BOARD OF MONTROSE COUNTY COMMISSIONERS

Carol L. Kruse

Carol L. Kruse, County Clerk and Recorder

David A. Ubell, Chairman

By: Connie I. Hunt
Connie I. Hunt
Deputy Clerk of the Board

WESTERN FUELS – COLORADO,
NEW HORIZON MINE

By: Robert L. Wade

Title: Mine Manager

Address: P.O. Box 628
Nucla, CO 81424

Phone 970-864-2265

ACORD CERTIFICATE OF LIABILITY INSURANCE

OP ID JV WESTE-1

DATE (MM/DD/YY) 10/06/00

PRODUCER
The Hays Group,Inc.
1650 IDS Center
80 South 8th St., Suite 1650
Minneapolis MN 55402
Phone: 612-333-3323

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED
Western Fuels Association,Inc.
Western Fuels Colorado, LLC
Attn: Robert Norrgard
1100 West 116th Avenue
Westminster CO 80234

INSURERS AFFORDING COVERAGE

INSURER A:	Federal Insurance Company
INSURER B:	National Union Fire Insurance
INSURER C:	
INSURER D:	
INSURER E:	

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PROJECT LOC	(01) 3710-10-46	01/01/00	01/01/01	EACH OCCURRENCE FIRE DAMAGE (Any one fire) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 2,000,000 $ 500,000 $ 10,000 $ 2,000,000 $ 2,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS	(01) 7318-48-04	01/01/00	01/01/01	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
	GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EA ACC / AGG	$ $ $
B	EXCESS LIABILITY OCCUR CLAIMS MADE DEDUCTIBLE RETENTION $	BE7391552	01/01/00	01/01/01	EACH OCCURRENCE AGGREGATE	$ 25,000,000 $ 25,000,000 $ $ $
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				WC STATU-TORY LIMITS / OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ $ $
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS
Montrose County is Additional Insured as their interests may appear.

CERTIFICATE HOLDER | N | ADDITIONAL INSURED; INSURER LETTER: ___

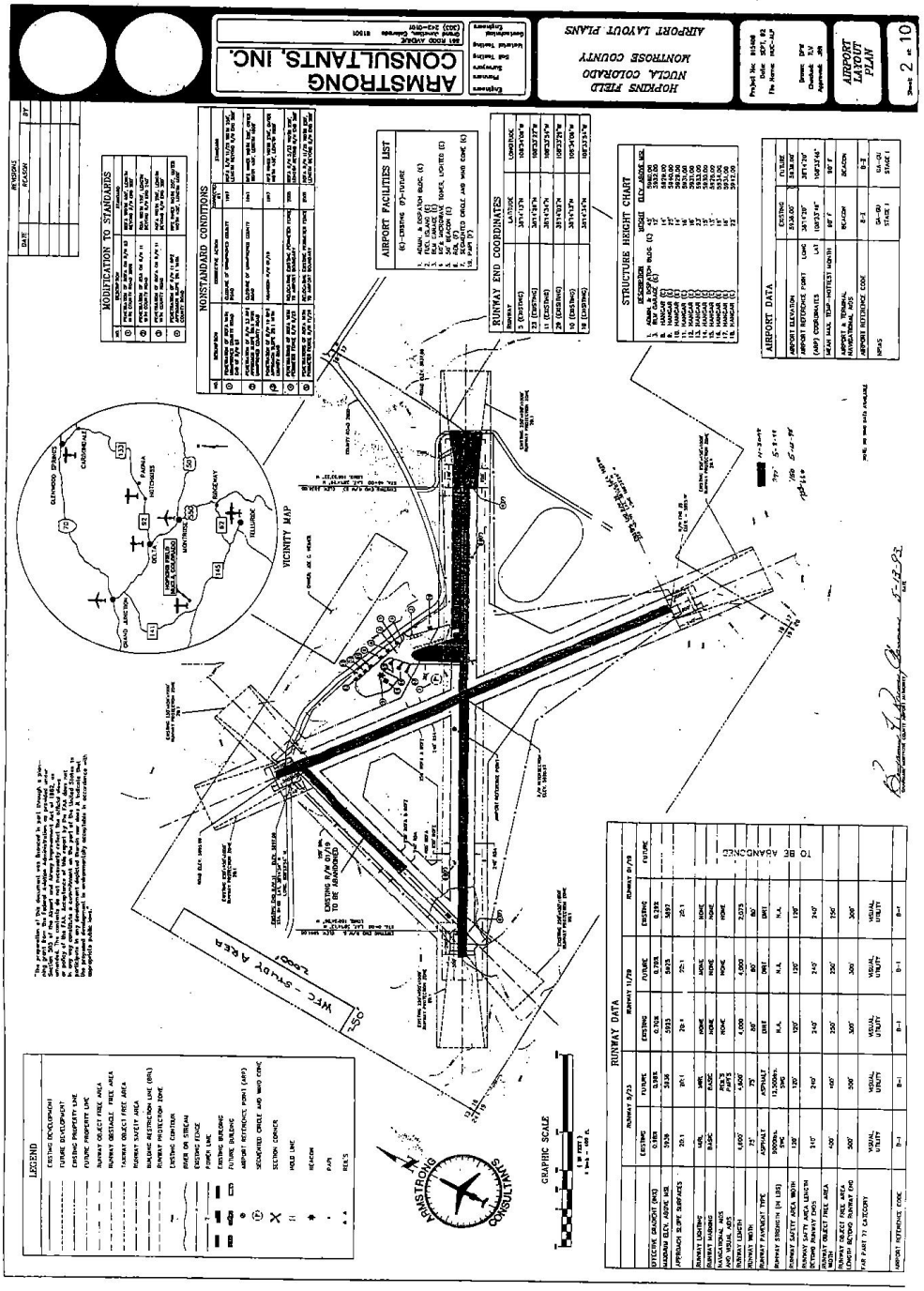
MONTRO1

Montrose County
Airport Administration
2100 Airport Road
Montrose, CO 81401

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

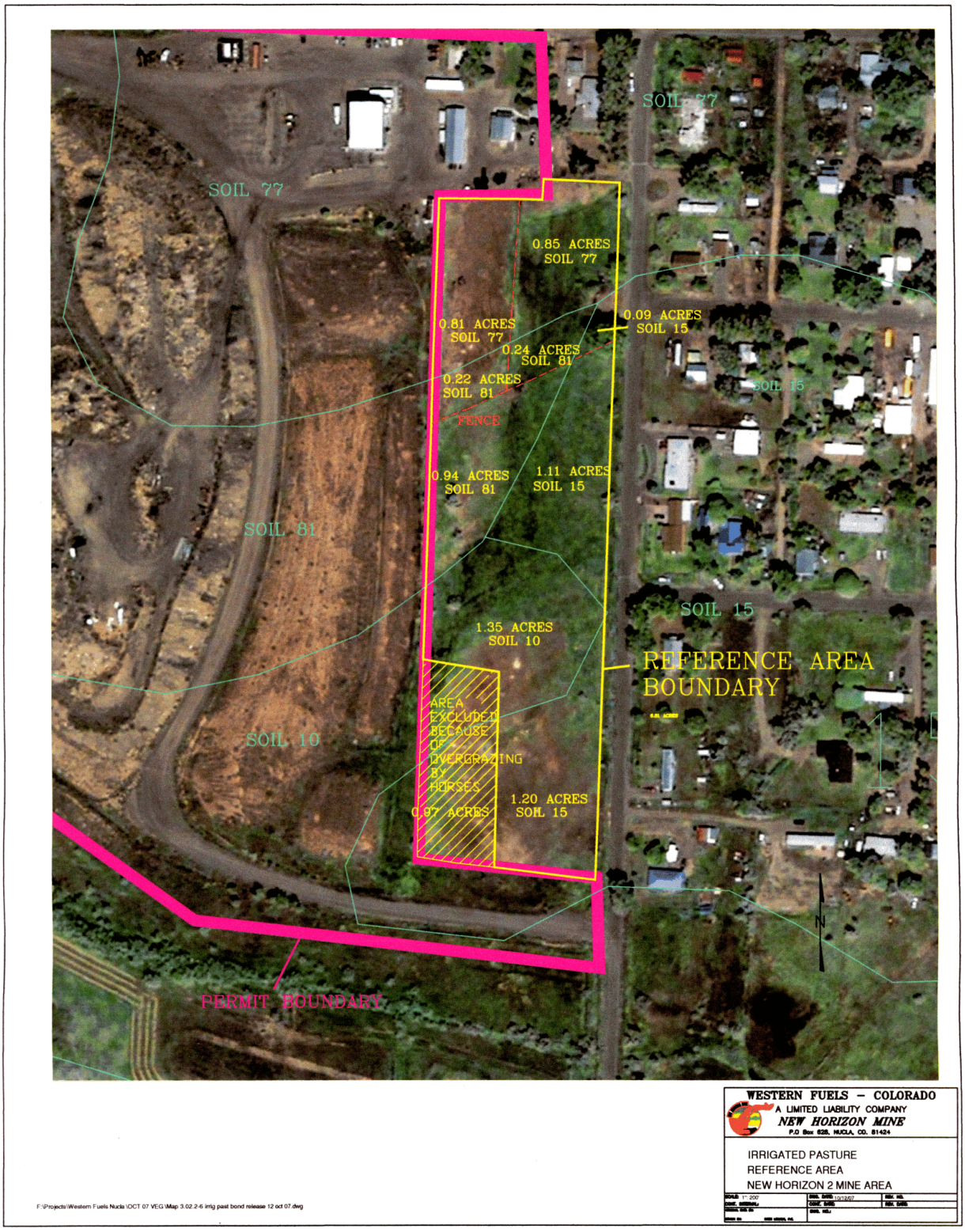
ACORD 25-S (7/97)


ARMSTRONG CONSULTANTS, INC.
HOPKINS FIELD
NUCLA, COLORADO
MONTROSE COUNTY
AIRPORT LAYOUT PLANS
AIRPORT LAYOUT PLAN
Sheet 2 of 10
LEGEND
EXISTING DEVELOPMENT
FUTURE DEVELOPMENT
EXISTING PROPERTY LINE
FUTURE PROPERTY LINE
RUNWAY OBJECT FREE AREA
RUNWAY OBSTACLE FREE AREA
TAXIWAY OBJECT FREE AREA
RUNWAY SAFETY AREA
BUILDING RESTRICTION LINE (BRL)
RUNWAY PROTECTION ZONE
EXISTING CONTOUR
RIVER OR STREAM
FENCE LINE
EXISTING BUILDING
FUTURE BUILDING
AIRPORT REFERENCE POINT (ARP)
DESIGNATED CIRCLE AND WIND CONE
SECTION CORNER
HOLD LINE
BEACON
PUMP
TREES
VICINITY MAP
NONSTANDARD CONDITIONS
MODIFICATION TO STANDARDS
AIRPORT FACILITIES LIST
RUNWAY END COORDINATES
STRUCTURE HEIGHT CHART
AIRPORT DATA
RUNWAY DATA
GRAPHIC SCALE
WFC - STUDY AREA
EXISTING R/W 07/25 TO BE ABANDONED
TO BE ABANDONED

Attachment 2.05.4(2)(e) - 5

Summary Tables of 2007 Sampling for Production and Cover,

Reclaimed Irrigated Pastureland Reference Area


SOIL 77
SOIL 77
SOIL 77
0.85 ACRES
SOIL 77
0.09 ACRES
SOIL 15
0.81 ACRES
SOIL 77
0.24 ACRES
SOIL 81
0.22 ACRES
SOIL 81
FENCE
SOIL 15
0.94 ACRES
SOIL 81
1.11 ACRES
SOIL 15
SOIL 81
SOIL 15
1.35 ACRES
SOIL 10
REFERENCE AREA
BOUNDARY
AREA
EXCLUDED
BECAUSE
OF
OVERGRAZING
BY
HORSES
0.97 ACRES
1.20 ACRES
SOIL 15
SOIL 10
N
PERMIT BOUNDARY
WESTERN FUELS – COLORADO
A LIMITED LIABILITY COMPANY
NEW HORIZON MINE
P.O Box 628, NUCLA, CO. 81424
IRRIGATED PASTURE
REFERENCE AREA
NEW HORIZON 2 MINE AREA
F:\Projects\Western Fuels Nucla\OCT 07 VEG\Map 3.02.2-6 irrig past bond release 12 oct 07.dwg

Sampling for production and cover was done in June 2007 by BIO-Logic Environmental, Steve Boyle, Principal Investigator. For production, all current year above-ground vegetation was clipped in a randomly-placed 0.25-m^2 sample frame. Sampling was terminated without reaching sample adequacy after 44 sample observations (mean of desirable vegetation = 2.512. 5 lb/acre, standard deviation = 1,726.3, estimated number of samples for adequacy = 80). The following table shows mean production estimates for plant life forms.

Plant Life Form	Mean Production (lb/acre)
Desirable Perennial Grasses	2,436.1
Desirable Perennial Forbs	0
Shrub	76.4
Total Desirable Plant Production	2,512.5
Undesirable Annual Grass (Cheatgrass)	1.1
Undesirable Annual Forbs (non-native annual weeds)	153.2
Noxious Weeds	9.7
Total Undesirable Plant Production	164.0
Total Plant Production	2,676.5

Cover was sampled using a laser point frame on randomly-placed 100-foot transects, making 10 first-hit cover observations perpendicular to the transect at each 10-foot interval on the transect. Sampling was terminated after 15 sample observations (mean cover of desirable plants = 68.6%, standard deviation = 23.2%, estimated number of samples for adequacy = 21). The following table shows estimates of mean absolute cover and relative cover (absolute cover as percentage of total vegetation cover).

Life Form/Species	Mean Absolute Cover (%)	Mean Relative Cover (%)
Unvegetated		
Bare Ground	3.5	
Litter	24.6	
Rock	0	
Total Unvegetated	28.1	
Desirable Perennial Grasses		
Sedge, *Carex* sp.	10.8	15.0
Orchardgrass, *Dactylis glomerata*	0.1	0.1
Tufted hairgrass, *Deschampsia cespitosa*	0.1	0.1
Intermediate wheatgrass, *Elytrigia intermedia*	1.7	2.4
Tall fescue, *Festuca arundinacea*	16.3	22.6
Meadow fescue, *Festuca pratensis*	3.9	5.4
Rush, *Juncus* sp.	5.8	8.1
Kentucky bluegrass, *Poa pratense*	18.1	25.1
Wheatgrass, *Elytrigia* sp.	6.4	8.9
Unidentified	0.1	0.2
Total Desirable Perennial Grasses	64.1	89.2
Desirable Perennial Forbs		
Buckhorn plantain, *Plantago lanceolata*	0.6	0.8
Common plantain, *Plantago major*	0.1	0.2
Dandelion, *Taraxacum officinale*	0.1	0.2
Alsike clover, *Trifolium hybridum*	3.6	5.0
Total Desirable Perennial Forbs	4.5	6.2
Total Desirable Vegetation	68.6	
Shrubs (Undesirable)		
Gumweed, *Grindelia aquamosa*	1.5	2.0
Total Shrubs	1.5	2.0
Annual Grasses (Undesirable)	0	0
Total Annual Grasses	0	0
Undesirable Annual Forbs		
Flixweed, *Descurainia sophia*	0.3	0.4
Redstem filaree, *Erodium cicutarum*	0.3	0.5
Curly dock, *Rumex crispus*	0.5	0.7
Total Undesirable Annual Forbs	1.1	1.6
Undesirable Noxious Weeds		
Field bindweed, *Convolvulus arvensis*	0.1	0.1
Total Noxious Weeds	0.1	0.1
Other Undesirable Plants		
Cattail, *Typha latifolia*	0.6	0.8
Total Other Undesirable Plants	0.6	0.8
Total Undesirable Vegetation	3.3	
Total, All Vegetation	71.9	

COVER - Statistical Comparisons, Phase 3 Reclaimed Areas		
	Reclaimed Irrigated Pastureland	
COVER - Statistical Comparisons, Phase 3 Reclaimed Areas	**Reclaimed Phase 3**	**Reference Area**
Mean Cover (X)	87.2	68.6
Standard Deviation (s)	5.0	23.2
No. of Samples (n)	17	15
Sample Adequacy	Yes	No
Standard Error (SE) = s/√n	1.22	6.00
SE (Satterthwaite)		5.53
Degrees of Freedom (df) (Satterthwaite)		15
Calculated t value (t_c)		76.020
t_t (table t-value) (1-tailed, P=0.10, df Satterthwaite)		1.341

Table A7. Vegetation production data and summary statistics, Irrigated Pasture Reference Area.

BIO-Logic Environmental
Dry Weight Production (g)

Western Fuels Colorado-New Horizon Mine, Vegetation Sampling 2007
Site: NH2 Irrigated Pasture Reference Area

	Dry Weight (g) per Sample Plot (0.25 m^2)											
Sample #	Desirable Peren. Grass	Desirable Annual Grass (Barley)	Desirable Peren. Forb	Undesir. Annual Grass (Cheatgrass)	Undesir. Annual Forb (annual weed)	Noxious Weed	Broom Snakeweed	Shrub	Total All Plants (g/m^2)	Total Desirable Plants (g/m^2)	Total All Plants (lb/acre)	Total Desirable Plants (lb/acre)
101	83.2								332.8	332.8	2,969.2	2,969.2
102					39.3				157.2	0.0	1,402.5	0.0
103	213.8								855.2	855.2	7,629.9	7,629.9
104	44.9		7.6						210.0	210.0	1,873.6	1,873.6
106	89.1		0.6						358.8	358.8	3,201.1	3,201.1
107			1.3						5.2	5.2	46.4	46.4
108	75.4								301.6	301.6	2,690.8	2,690.8
109	52.6								210.4	210.4	1,877.1	1,877.1
110	152.6		11.0						654.4	654.4	5,838.4	5,838.4
111	52.8		1.8						218.4	218.4	1,948.5	1,948.5
112	51.5		1.6		1.0				216.4	212.4	1,930.7	1,895.0
113	88.3								353.2	353.2	3,151.2	3,151.2
115	26.4					1.3			110.8	105.6	988.5	942.1
116	2.9		3.9			1.9			34.8	27.2	310.5	242.7
117	103.9								415.6	415.6	3,707.9	3,707.9
118	66.1								264.4	264.4	2,358.9	2,358.9
119	99.3								397.2	397.2	3,543.7	3,543.7
121					11.1				44.4	0.0	396.1	0.0
122	114.9		6.9						487.2	487.2	4,346.7	4,346.7
123	38.0								152.0	152.0	1,356.1	1,356.1
124	22.6								90.4	90.4	806.5	806.5
125			2.2		39.1				165.2	8.8	1,473.9	78.5
126	60.3		4.7						260.0	260.0	2,319.7	2,319.7
127					48.2				192.8	0.0	1,720.1	0.0
128	77.5								310.0	310.0	2,765.8	2,765.8
129	1.1			1.4	22.6				100.4	4.4	895.7	39.3
130	64.2								256.8	256.8	2,291.1	2,291.1
131	117.0								468.0	468.0	4,175.4	4,175.4
132	18.6								74.4	74.4	663.8	663.8

Table A7. Vegetation production data and summary statistics, Irrigated Pasture Reference Area.

Sample #	Dry Weight (g) per Sample Plot (0.25 m^2)								Total All Plants (g/m^2)	Total Desirable Plants (g/m^2)	Total All Plants (lb/acre)
	Desirable Peren. Grass	Desirable Annual Grass (Barley)	Desirable Peren. Forb	Undesir. Annual Grass (Cheatgrass)	Undesir. Annual Forb (annual weed)	Noxious Weed	Broom Snakeweed	Shrub			
134	30.8								123.2	123.2	1,099.2
135	65.6								262.4	262.4	2,341.1
136	104.0								416.0	416.0	3,711.5
137	21.6		13.2						139.2	139.2	1,241.9
138	27.7		17.4						180.4	180.4	1,609.5
139	82.1		21.5						414.4	414.4	3,697.2
140	85.3								341.2	341.2	3,044.1
142	81.2				27.6				435.2	324.8	3,882.8
143	97.5								390.0	390.0	3,479.5
144	110.0								440.0	440.0	3,925.6
145	120.1					8.7			515.2	480.4	4,596.5
146	108.7								434.8	434.8	3,879.2
147	153.0								612.0	612.0	5,460.1
148	114.2		0.5						458.8	458.8	4,093.3
150	84.8								339.2	339.2	3,026.3

Sample Adequacy:	
2,512.5	Mean
1,726.3	Standard Deviation
44	N actual
1.302	t-alpha (1-tailed, P=0.10, df=n-1)
80	N minimum

Table A1. Vegetation cover data and summary statistics, Irrigated Pasture Reference Area.

	Unvegetated			Shrub		Perennial Grass															Annual Grass	
Transect	Bare	Litter	Rock	GRSQ		BRBI	Carex	DAGL	DECE	ELIN	FEAR	FEPR	Juncus	PHPR	Poa	PSHY	POPR	Pu	Wheatgrass #1	Wheatgrass #2		
101		10					29				16	3	2				27			10		
102	26	39		22				1														
103		4					5			24	19	2	10				36					
104		38					11				3						22			19		
106		16					10			1	12		16				36			2		
107		20					11		1		6		9				24			18		
108	2	35					21				24		5				4			2		
109		25					5				30		19	14			4					
110		26					2				28	30					6					
112		34					9			1	23	4	14				11					
113		35					2				2						28			12		
115	1	54									14	1	3				23	2				
116	24						30				8						13			20		
117		29					14				20	18	7				12					
111A		4					13				39		2				25			13		
Mean	3.5	24.6	0.0	1.5	0.0	0.0	10.8	0.1	0.1	1.7	16.3	3.9	5.8	0.9	0.0	0.0	18.1	0.1	0.0	6.4	0.0	0.0

Attachment 2.05.4(2)(e) - 6

Coal Lease Agreement with

Frank and Marie Lou Morgan

COAL MINING LEASE

Made as of the 10th day of Sept., 1998 ("Lease Date"), FRANK E. AND MARY LOU MORGAN, "Lessor", whether one or more), with address at 26498 BB27 ROAD, P.O. BOX 4, NUCLA, CO 81424, for good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged by Lessor, hereby leases to Western Fuels-Colorado, A Limited Liability Company, a Colorado limited liability company ("Lessee"), with address at the following described land ("Property") and the coal mineral deposits ("Coal") located in, on and under the Property:

T46N, R16W, N.M.P.M.

SECTION 1: NE1/4 NE1/4 (also known as Lot 1), NW1/4 NE1/4 (also known as Lot 2), NE1/4 NW1/4 (also known as Lot 3), N1/2 N1/2 SW1/4 NE1/4, and N1/2 N1/2 SE1/4 NW1/4

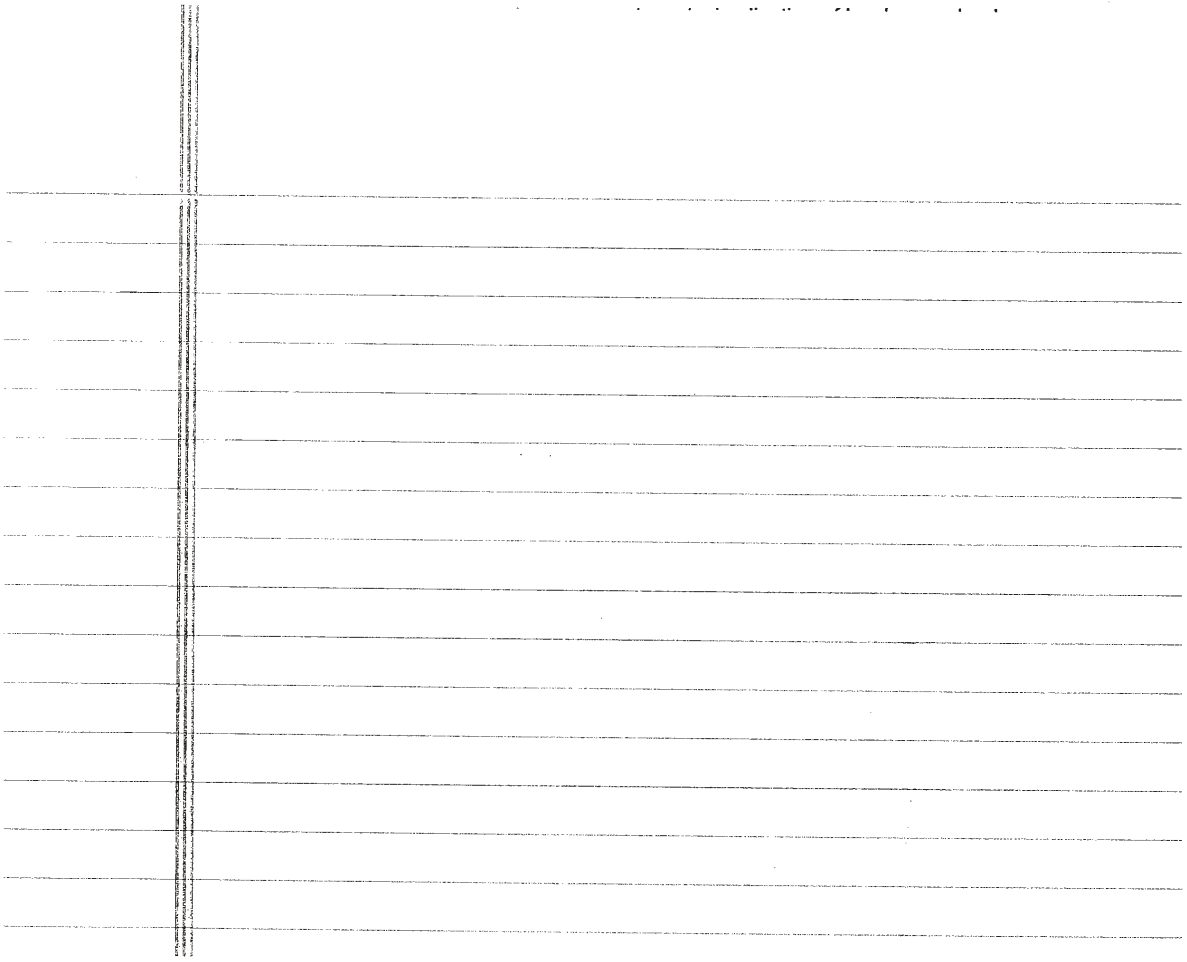
containing 140 acres, more or less, excluding approximately twenty-five (25) acres of land that includes the area South of the Colorado Cooperative Ditch in Lot 1, Lot 2 and the parcels of land immediately South of the boundary of Lot Nos. 1 and 2, which is indicated on the map as adjoining property, with all of the rights ("Rights") to conduct mining activities as described in Section 3 of this Lease (herein referred to as the "Rights"). The map is attached hereto and made a part hereof as Exhibit A. It is noted that Lessor may own coal under County Roads and other rights-of-way or easements that mining will disturb. If so, Lessor will be paid royalties on all coal owned by Lessor that is mined. [Note: attached "consent of Mortgagee, if applicable].

BY THIS LEASE, LESSOR INTENDS TO LEASE TO LESSEE ALL OF LESSOR'S RIGHT, TITLE AND INTEREST IN THE COAL IN, ON OR UNDER THE PROPERTY, UPON THE TERMS AND CONDITIONS STATED HEREIN.

1. Term. This Lease shall be in effect for twenty (20) years commencing on the Lease Date stated above and for so long thereafter as: (a) coal is produced in commercial quantities from the leased lands, (b) the Property is being reclaimed per the requirements of the mining permit covering the Property issued by the Colorado Division of Minerals and Geology, Office of Mined Land Reclamation.

1 FEM

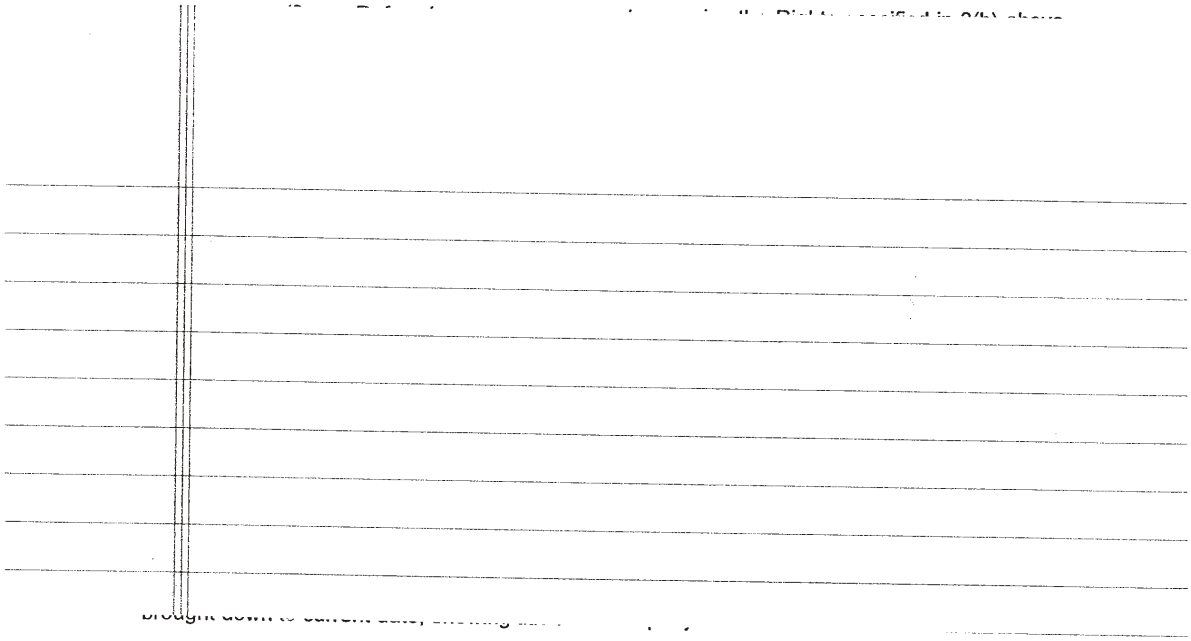
3. Special Rights of Lessee. In consideration of payment of royalties, when and as due



(e) to use water rights appurtenant to the Property (e.g. springs, wells, private ditches, etc.) as is necessary and convenient for Lessee. Lessee agrees to use only the quantity of Lessor's water needed to reclaim Lessor's property, not to exceed 50 shares of Lessor's ownership of the Colorado Cooperative Ditch Company. For the use of water and other considerations, Lessee shall pay Lessor the annual water assessment and [redacted] per share per year for up to 50 shares of

L.E.M.

C.C. Water Stock actually used beginning in the year Lessee starts using Lessor's water shares. Lessor will continue to use remainder of his ditch water on other parts of Lessor's farm. Lessor warrants that it owns such water rights and may allow Lessee to use such water, however, Lessee shall in no event acquire ownership of any water rights of Lessor. Lessor may use the surface of the Property for farming or any other use until Lessee elects to exercise its Rights stated above. If Lessee, in fulfillment of its legal obligations to reclaim mine lands, undertakes farming activity on any portion of the Property, the Lessee will cause the Property to be planted as necessary, and may contract with Lessor, if economically feasible, to farm the Property to the Lessee's specifications. Lessee agrees to cooperate with Lessor on choice of reclamation crops. However, it is expressly understood that final crop selection for reclamation must be approved by the Colorado Division of Minerals and Geology. No provision of this Lease shall be construed to deprive Lessee of the exclusive right to determine the uses to which the Property is to be put after mining, or the crops, if any, to be raised, or the methods to be employed and the costs to be incurred as part of such after-mining uses.



L.E.M.

8

(d) Lessee shall reclaim the Property so that the Property is approximately in the same condition as when Lessee entered the Property (i.e., a farmable condition). This includes returning the land to cropland to grow alfalfa or row crops, leaving land flat enough for irrigation and picking rocks to the extent a rock picker is capable. The reclamation standard will be as approved by DMG with Lessor's consent.

LESSEE:

WESTERN FUELS-COLORADO, A LIMITED LIABILITY COMPANY,

BY Hub Thompson

STATE OF Colorado)
COUNTY OF Montrose)

The foregoing instrument was acknowledged before me this 10th day of September, 1998, by Hub Thompson, as President of Western Fuels-Colorado, A Limited Liability Company.

Witness my hand and official seal.

Carla I. Turner

CARLA I TURNER
Notary Public
State of Colorado

Notary Public

My Commission expires: February 18, 2000

9 12:M.

LESSOR:

Frank E. Morgan

LESSOR:

Mary Lou Morgan

STATE OF Colorado)
COUNTY OF Montrose)

The foregoing instrument was acknowledged before me this 10th day of Sept., 1998, by Frank Morgan and Mary Lou Morgan.

Witness my hand and official seal.

EVELYN M. GARNER NOTARY COLORADO

Notary Public

My Commission expires: 7-7-01

RETURN RECEIPT REQUESTED

Western Fuels-Colorado
P.O. Box 628
Nucla, Colorado 81424

Telephone 970/864-2165
Fax 970/864-2168

April 28, 2010

Mr. and Mrs. Frank Morgan
P.O. Box 4
Nucla, CO 81424

Mike Morgan and JoEllen Turner
P.O. Box 346
Nucla, CO 81424

RE: Reclamation of Morgan Property

Mr. and Mrs. Frank Morgan, Mike Morgan and JoEllen Turner:

Western Fuels-Colorado, LLC (WFC) is returning as you requested the signed original agreement for additonal water shares for the post mining reclamation of the Morgan's land.

We noticed that the executed agreement you tendered was not signed by Jo Ellen Turner or by M & M Custom Farming. We are executing this agreement in the good-faith belief that it is binding upon those parties as well, and it is our intent in signing this letter that those parties are also bound by this agreement.

Sincerely,

R. Lance Wade

Mine Manager

Enclosure
XC: Duane Richards w/Enclosure
Christopher Kamper w/Enclosure

Return Signed Copy Required

Lessor agrees to lease 50 shares of CCC water and an additional 12 shares, for a total of 62 shares of CCC water to WFC for reclamation on the Morgan property. The ENTIRE 140 acres minus the 25 acres will be returned to irrigated crop production. 62 shares is sufficient to irrigate all the acres on the Morgan Property being mined. Since Michael Morgan and JoEllen Turner will be doing the irrigating, if for any reason this amount of water is not enough, the Morgans will make sure there is more water if needed. This will be determined by 50 years of experience irrigating the place and the Morgans calculations of what is needed. This 62 shares will not be used on property other than Morgans and for no other purpose other than reclamation of this prime farmland.

Lance Wade, Mine Manager

Frank Morgan

Frank E Morgan

Mary Lou Morgan

Mary Lou Morgan

Mike Morgan

Mike Morgan

Attachment 2.05.4(2)(e) - 7

NRCS and WFC Provided

Sideroll Irrigation Designs - Irrigated Cropland

Attachment 2.05.4(2)(e) - 8

Correspondence with Landowners on Post-Mining Land Use Changes

Attachment 2.05.4(2)(e) - 9

Flood and Sideroll Irrigation Designs - Reclaimed Irrigated Pastureland

Attachment 2.05.4(2)(e) - 10

WFC Irrigation Plan Letters to Landowners and Receipts

Attachment 2.05.4(2)(e) - 11

NRCS Letter with Recommended Procedures for Soil Preparation, Seeding and Management