

Twentymile Coal, LLC Foidel Creek Mine 29515 RCR 27 Oak Creek, CO 80467 970.879.3800

July 28th, 2021

Routt County Planning Department 136 6<sup>th</sup> Street Steamboat Springs, Colorado 80477

#### RE: Twentymile Coal, LLC - Foidel Creek Mine (Permit No. C-82-056), Technical Revision (TR21-97) 7East Cross Entries Borehole Pad with Rock Dust Tank & Minor Revision (MR21-319) 18Left Dewatering Borehole Pad.

Sir or Madem,

Twentymile Coal, LLC (TC) has requested the Colorado Division of Reclamation Mining and Safety's approval of a Technical Revision (TR21-97) to our existing approved Permit for construction, operation, and reclamation of a new borehole and pad for the use of pumping grout and rock dust into the current mining area. TC has also requested the approval of Minor Revision (MR21-319) for the construction, operation, and reclamation of a new dewatering Borehole, pad site, and pipeline in the seal Western Mining District.

Under the approval of TR21-97 TC will be pumping grout into the underground working to stabilize cross entries in the longwall panel as the longwall mines through them. A 300' x 300' pad site will be constructed, and a borehole will be drilled 1,550 feet into the mine workings. A temporary cement plant will be set up on the already established 6MN pad site for the 1-month duration of the pumping project. Once the grout project is complete TC plans to convert the borehole to a rock dust drop and a rock dust tank will be set up on the surface borehole pad site. The pad site will be located near the Twentymile Mine on the 6 Main North mine road, prior to the 5MN Fan Site, north of the main facilities.

Installation of the new 7East Borehole and Pad site (TR21-97) will involve placement of construction erosion controls (silt fence and/or straw wattles), removal and stockpiling of soil materials and the limited vegetation from the pad areas and newly disturbed roads, construction of the designed drainage structures (ditches and rock sumps), minor cut and fill grading to establish the access road and level drill pads, placement of gravel surfacing on the roads and pad areas, excavation of temporary cuttings pits on the drill pads, and drilling and casing of the boreholes. On completion of drilling and casing operations, the cuttings pits will be allowed to dry-out, material excavated from the pits will be replaced and graded, and gravel surfacing will be extended for the affected areas to control erosion and sediment and provide an all-weather operating surface. The completed borehole pad site installation will include the light-use road access, soil material stockpile, a leveled drill pad, 14-inch diameter cemented surface casings (60 feet deep), 9-inch diameter cased borehole, and a rock dust tank once the grout project is complete.

Under the approval of MR21-319, TC will construct a drill pad, drill a borehole 1,645 feet into sealed mine working, and install 1710' feet of new pipeline that will connect into an existing mine water pipeline. Overhead power will be ran to the site to power a large pump that will be placed at the bottom of the borehole and will pump 900 GPM of mine water and send it to other locations with in the mine or to the Twentymile Mine facilities to be used for processing the coal in the wash plant. The pad site will be no larger than 175' by 200' and will require 2,100 feet of light duty access road. A small Conex building will be placed at the site to house the electrical controls. The pad site will be accessed from the existing 16LT mine road and is located on the west side of County

Road 27 and north of the intersection of CR37 and CR27 on property owned by Jeff Chance. TC will have a surface use agreement in place with the land owner prior to construction of the project.

Installation of the new 18Left Dewatering Borehole and Pad site (MR21-319) will involve placement of construction erosion controls (silt fence and/or straw wattles), removal and stockpiling of soil materials and the limited vegetation from the pad areas and newly disturbed roads, construction of the designed drainage structures (ditches and rock sumps), minor cut and fill grading to establish the access road and level drill pads, placement of gravel surfacing on the roads and pad areas, excavation of temporary cuttings pits on the drill pads, and drilling and casing of the boreholes. On completion of drilling and casing operations, the cuttings pits will be allowed to dryout, material excavated from the pits will be replaced and graded, and gravel surfacing will be extended for the affected areas to control erosion and sediment and provide an all-weather operating surface. The completed borehole pad site installation will include the light-use road access, soil material stockpile, a drill pad, 18-inch diameter cemented surface casings (60 feet deep), 12-inch diameter cased borehole, 8-foot diameter CMP culvert manhole, and pump and electrical installations.

The pipeline installation will involve removal and windrowing of soil materials for the 40-foot maximum width pipeline construction areas; trenching; placement of suitable bedding materials; placement of 12 inch HDPE pipe, fusing connections, and pressure testing of the pipelines; backfilling and compaction of suitable fill materials around and over the pipelines; backfilling and compaction of the trenches; re-grading; and replacement of soil materials and re-vegetation of all disturbed areas. The pipeline corridor is approximately 1,710 feet. The pipeline disturbance areas will be progressively reclaimed as the pipelines are constructed. While the entire pipeline disturbance areas will be reclaimed within a reasonable time period following pipeline installation, TC does not consider these areas to be reclaimed for purposes of reporting, since there is some potential that they may be redisturbed for pipeline repair or maintenance in the future. At the time of final reclamation, inspection manholes will be removed or demolished to 3-feet below grade, and the pipeline will be cut-off below grade, capped, and abandoned in place.

Partial or full reclamation of borehole pad site disturbances will include, as appropriate, removal of the manhole structures, plugging and sealing of the boreholes consistent with State Engineer requirements, removal of pad and road surfacing materials, grading of pad and road areas to a stable configuration that blends with the surrounding terrain, replacement of soil materials, and revegetation with the approved rangeland seed mix. As appropriate, TC may reclaim portions of the pad areas, leaving only the light-use access roads and a limited area around the manholes for inspection and maintenance access.

We would like to proceed with this project ASAP to avoid any operation delays. We, therefore, appreciate your consideration, cooperation, and assistance in facilitating timely review and approval of this application. After you have opportunity to review the accompanying information, please feel free to contact me with any questions or to discuss submittal materials or related matters.

Sincerely,

Miranda Kawcak

Miranda Kawcak Environmental Manager mblomquist@peabodyenergy.com 970-870-2718



Representative / Primary Contact Miranda Kawcak

Mailing Address	29515 Routt County Road 27				
City Oak Creek		State	Colorado	Zip	80467
Phone 970-870-2	2718	Email	mkawcak@peabodyenergy.com	י י	

#### IV. PROPERTY OWNER

Name	Chance Revocable Living Trust	and Sage Creek Land & I	Reserves	<u></u>
Mailing	Address PO Box 119			
City B	allico	Stat	e California	
Phone	209-874-311	Emc	11 JGChance	D.f. ne 2 Wire. Com
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#### V. PROPERTY INFORMATION

Property Address 31405 Routt County Road 27, Hayden, Colorado 8163	9						
General Location Approximately 15 miles Southeast of Hayden, Colorado along Routt County Road 27							
Legal Description (may be attached) See Attached							
Parcel Identification No. (PIN) 944222001 and 945161001 Property Size (acres) 1971.5 ac.							
Current Use Rangeland/Agriculture/Mining Zoning AF							
Proposed Use Rangeland/ Agriculture/ Mining	-						

#### VI. SIGNATURES

This application form must be signed by both the applicant and legal owner of the property. Attach additional pages if necessary.

By signing below, the applicant acknowledges that all information contained on this application form and within accompanying submittals are true and correct and agrees to pay all required fees associated with this application. The base fee is indented to cover the estimated minimum staff hours to process the application. Any additional staff hours will be assessed at \$120 per hour. The applicant signing below is responsible for all additional hourly fees. Failure to pay fees may result in revocation of a permit/approval.

Applicant's Signature

Print/type name of applicant

By signing below, the property owner authorizes the applicant to petition Routt County for approval of the submitted application.

Ance Owner's Signature

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Print/type name of property owner

## APPLICATION FORM: LAND USE & ZONING

Activity No.						OFI	TICE U	JSE
Base Fee \$				Receij	pt No			
Received By				Date				
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Deemea Con	npiete	• Бу		Date				

Conditional Use Permit (CUP)

- Special Use Permit (SUP)
- Conceptual PUD

Zip 80467

□ Final PUD

•	A	APPLICAT	ION FORM: I	LAND US	SE & ZONING
Routt County		Activity No			OFFICE USE
		Base Fee \$		Receipt No.	
Pidnning Department		Received By		Date	Constant of the second
Steamboat Springs, CO 80477 (970) 879-2704		Received By		Date	NE PERMIT
fax (970) 879-3992 www.co.routt.co.us		Deemed Comple	te By	Date	
I. PROJECT NAME	out Borehole and Pad Site	(site #2, appli	ed with 18LT Dewater	ing Pad and Bo	orehole)
<b>II. TYPE OF REVIEW</b> <i>This application form <u>must</u> be accom</i>	panied by the applicable	submittal check	list.		
□ Minor Use Permit □ Admin	istrative Permit	🛛 Site Plan R	Review	🛛 Condi	tional Use Permit (CUP)
□ Sign Permit □ Water	Body Setback Permit	Pre-Applic	cation Conference	□ Specia	al Use Permit (SUP)
Special Event Permit     Floodp	lain Development Permit	Zoning An	nendment/Rezoning	Conce	ptual PUD
Administrative Amendment to CUP	/SUP/PUD/Site Plan	Variance		□ Final P	UD
III. APPLICANT Name Twentymile Coal, LLC Mailing Address 29515 Routt County R City Oak Creek	oad 27	State	Colorado	Zip	80467
Phone 970-870-2718		Email	mkawcak@peabodye	nergy.com	
Representative / Primary Contact Mir	anda Kawcak				
Mailing Address 29515 Routt County R	pad 27				
City Oak Creek		State	Colorado	Zip	80467
Phone 970-870-2718		Email	mkawcak@peabodye	nergy.com	
IV. PROPERTY OWNER Name Sage Creek Land & Reserves, L	LC (Peabody)				
Mailing Address 701 Market Street, ST	E 862				
City St. Louis		State	Missouri	Zip	63101
Phone 970-870-2719		Email	psollars@peabodyen	ergy.com	
V. PROPERTY INFORMATIO	<b>DN</b> Road 33, Oak Creek, Colora	do 80467			
General Location Approximately 15 mi	es Southwest of Steamboat	Springs, Colorad	to along Routt County	Road 33	
Legal Description (may be attached)	SW4NE4,S2NW4,N2SW4 S	SEC 15-5-86 ALL	SEC 16-5-86		
Parcel Identification No. (PIN) 9451610	001	Proper	rty Size (acres) 840 a	C.	
Current Use Rangeland/ Agriculture/ Mir	hing	Zoning	AF		
Proposed Use Rangeland/ Agriculture/ I	lining				

#### VI. SIGNATURES

This application form must be signed by both the applicant and legal owner of the property. Attach additional pages if necessary.

By signing below, the applicant acknowledges that all information contained on this application form and within accompanying submittals are true and correct and agrees to pay all required fees associated with this application. The base fee is indented to cover the estimated minimum staff hours to process the application. Any additional staff hours will be assessed at \$120 per hour. The applicant signing below is responsible for all additional hourly fees. Failure to pay fees may result in revocation of a permit/approval.

Applicant's Signature

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Print/type name of applicant

By signing below, the prope authorizes the applicant to petition Routh County for approval of the submitted application.

Property Owner's Signature

Print/type name of property owner

#### ENVIRONMENTAL ANALYSIS REPORT

The proposed 7East Borehole Site and the 18LT Dewatering Borehole Site and pipeline installation activities will result in minimal impact to the environmental resources of the area. The proposed activities include localized access and pad construction, drilling and casing of the boreholes, installation of the associated pipeline, use of the pipeline and boreholes to transfer grout to the underground working (7East) or dewater the sealed mine workings (18LT), and reclamation of the boreholes, road, pads, and pipeline when they are no longer needed to support ongoing operations.

<u>Geologic Hazards</u>: There are no known geologic hazards for the proposed borehole pads, road, and pipeline. The general topography of the proposed boreholes and pipeline areas includes a low-gradient valley and sideslope areas (pipeline).

**Hydrologic Hazards:** There are no anticipated hydrologic hazards for the proposed borehole pads, roads, and pipeline. The borehole pad locations, road, and pipeline both lie in a low-gradient valleys and sideslope areas and are above the Fish Creek floodplains. The borehole completion activities will involve drilling through sandstone units, which may function as aquifers in the area (dependent on recharge, transmissivity, and lateral continuity). On completion of drilling, the boreholes will be cased and grouted to minimize the potential for any hydraulic communication between the multiple sandstone units.

**Vegetation:** Previous vegetation investigations for the existing TC Foidel Creek Mine Permit did not identify any currently listed threatened or endangered plant species as occurring within the project area. The only rare plant species with Federal status that potentially could occur in the project area is the Ute Lady's Tresses orchid (*Spiranthes diluvialis*). The only suitable habitat for this species mapped in Routt County is in the vicinity of the Yampa River along the floodplain, which is several miles north and west of the project area. Several plants regarded as rare by the Colorado Natural Heritage Program (CNHP, http://www.cnhp.colostate.edu; accessed 4/10/08) have been located in the Little Snake Resource Area, though mostly at lower elevations and to the west of the project area. The only CNHP rare plant species with some potential for occurrence in the TC area are Harrington beardtongue (*Penstemon harringtonii*) and Autumn willow (*Salix serissima*). Habitat for Harrington beardtongue typically occurs at elevations between 6,800 and 9,200 feet, and while much of the area is within this elevation range, no occurrences of Harrington beardtongue have been identified in this area. Habitat for Autumn willow is defined as occurring between 7,800 and 9,300 feet. While elevations in the area approach 7,500 feet, no occurrences of Autumn willow have been identified in the project area.

<u>Wildlife:</u> The sagebrush, pastureland and mixed brush vegetation types in this area support a variety of wildlife species. Information on wildlife in the vicinity of the Twentymile area was obtained from federal and state agencies, as well as, site-specific studies for adjacent coal properties. The Bureau of Land Management (BLM) and Colorado Parks and Wildlife (CPW), in partnership with CNHP, keep information on area wildlife including big-game and game birds and other species of concern. This includes federal- and state-listed threatened and endangered (T&E) species, and other species considered to be rare or of special interest.

<u>Big Game:</u> The general project area provides good year-round habitat for deer, elk, and pronghorn. The CPW and U.S. Fish and Wildlife Service (USFWS) have identified winter range within the project and adjacent areas (Natural Diversity Information Source; http://www.ndis.nrel.colostate.edu; accessed 4/7/08).

<u>Raptors:</u> The project area does not contain potential nesting habitat for raptors, but the project and adjacent areas may be utilized by raptors for hunting. CPW data includes historic nest sites of golden eagles, red-tailed hawks, and other *Buteo* species. Bald eagles are listed as a state threatened species. CPW data shows a historic bald eagle nest location approximately 7-8 miles north of the project area, as well as, winter range along the Yampa River corridor. The ferruginous hawk and peregrine falcon are state listed species of concerns, as well as on the BLM's sensitive species list. Their occurrence in the area is likely, however, there are no known nest locations in or near the project area (CPW data shows the nesting distribution for the ferruginous hawk further to the west in Moffat County).

<u>Game Birds:</u> Greater sage-grouse and Columbian sharp-tailed grouse (both state and BLM species of concern) are known to inhabit and/or utilize the general area. CPW mapping identifies sage grouse and sharp-tailed grouse leks (both active and inactive) within the Mine and adjacent areas. Mapped sharp-tailed grouse leks occur in close proximity to the project area, and the associated buffer zones overlap the proposed borehole pad locations.

TC plans to consulted with the CPW regarding potential impacts to grouse and grouse habitat in the multiple borehole project areas. While the project area includes areas of "Restricted Surface Occupancy" associated with mapped sharp-tailed grouse leks, the CPW is reviewing the mapping to determine whether or not the leks of concern are active. The schedule for most of the project work puts this work outside of the period of active grouse use, and future activities would be limited to periodic inspection and maintenance. If review of the potentially affected leks indicates they are active, the CPW will develop proposed mitigation measures, which may include project scheduling and other constraints.

<u>Federal and State Species of Concern:</u> Greater sandhill cranes are a state species of concern (CNHP, 2008). Wildlife surveys have documented historic sandhill crane nest locations in the general area, but no recent evidence of nesting in the project area. The dominant nesting areas in the general area are approximately 10-15 miles to the north, along the Yampa River. Area fields and improved cropland pasture are used by cranes on an intermittent basis for loafing and/or foraging.

Other BLM sensitive species or state species of concern with the potential to occur in the project area are the northern goshawk, mountain plover, black tern, long-billed curlew and white-faced Ibis. Their occurrence in the immediate project area would be as a rare seasonal visitor or migrant passing through the area.

<u>Threatened or Endangered Species</u>: The western yellow-billed cuckoo is a candidate for listing by USFWS under the Endangered Species Act (ESA). Habitat for this bird may occur along the Yampa River corridor and its presence is possible in the vicinity as a rare seasonal visitor or migrant passing through the area. As noted above, the bald eagle is listed as state threatened.

Foraging bald eagles are commonly observed in the area in winter, when they are most numerous in the region.

Habitat for the Bonytail, Colorado pike-minnow, humpback chub and razorback sucker does not occur within the project area. Critical habitat for these fish species, which are federally-listed endangered species under the ESA, exists in the Yampa River downstream in Moffat County.

As part of the required consultation process, TC will provide the CPW with mapping and other information on the proposed borehole program for review. It is not anticipated that the proposed borehole activities will negatively impact existing wildlife species or populations.

Given this information, TC submits that the borehole, pipeline, and reclamation activities described in this application will not jeopardize the continued existence of any threatened or endangered species listed pursuant to Section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533) or the Nongame, Endangered or Threatened Species Conservation Act (Section 33-8-101 *et seq.* C.R.S. 1973), or result in the destruction or adverse modification of critical habitat for those species.

<u>Soils:</u> Soils within the project area are formed primarily from weathered fine-grained sandstone, siltsone and shale. The dominant soils are Argiustolls, Haplocryolls, and Palecryolls associations, and are moderately-deep to deep, well-drained, and have loam to fine-sandy-loam surface textures (Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture. Web Soil Survey. *Custom Soil Resources Report for Routt Area, Colorado, Parts of Rio Blanco and Routt Counties.* http://websoilsurvey.nrcs.usda.gov/accessed [04/07/08]).

The only potential for erosion problems would be associated with the drill-pad and road, however given the very limited size of the pad, limited road length, their location in a low-gradient valley and sideslope area with very limited upgradient drainage, and the proposed drainage control measures, this potential is not significant. The borehole installations will remain in place until it is no longer needed to support ongoing or anticipated future mining operations, and the related drainage and sediment control measures will be maintained until the associated disturbance is reclaimed.

#### **POLLUTION REPORT**

<u>Air Pollution Potential:</u> The proposed borehole activities will have little or no impact on local and regional air resources. The limited vehicular traffic to and from the borehole will have minimal potential to generate any significant quantity of dust from the existing Mine and county roads. The rotary drill-rig will use a mud/water mixture to remove cuttings from the borings, thus minimal dust will be generated during the drilling process.

<u>Water Pollution Controls</u>: The water pollution control plan focuses on the borehole site where implementation of Best Management Practices (BMPs), i.e. gravel surfacing, diversion ditches with rock sumps, silt fence, straw wattles, etc., and limited pad size will effectively control runoff and sediment. Additionally, mud pits will be excavated at the drill-site or porta-pits will be used to contain any drilling fluids used during drilling operations. Following completion of the drilling and related activities, the mud pits will be backfilled, and the pad area will be graded and gravel will be placed as surfacing.

Note that a Construction Stormwater Discharge Permit is not required. The CDRMS will reviewed and generally approves small sites such as the proposed site with drainage measures under applicable provisions for a "Small Area Exemption"

**Noise Abatement:** The proposed borehole sites are not within 0.5 mile of a private residence. TC plans to schedule drilling operations on a 12-hour per day basis, and may increase this up to 24-hours per day if necessary to complete drilling under time constraints. The drilling activities should take about five to seven days per borehole. The type of equipment that will be used includes a rotary drill-rig, water trucks, pipe trucks, pickup trucks, and miscellaneous support trucks.

**Landscaping:** A landscape plan is not necessary, given the limited nature of the borehole activities. The information provided in the reclamation plan addresses final site grading and revegetation for the access road and borehole pads.

#### **RECLAMATION PLAN**

The proposed access road, borehole pads, and pipeline are located in a low-gradient valleys and on shallow sideslope areas. The maximum pad dimension will be 300 x 300 feet, and road disturbance will be limited to a 40 foot road corridor, with a typical road width of 25 feet. Construction will be conducted in accordance with Rule 2.02.2(2)(f) and 4.21.4(5) of the Regulations of the Mined Land Reclamation Board for Coal Mining. Prior to earth-moving or excavations of any type, available soil materials will be salvaged and stored in an area that will be undisturbed and not subject to excessive wind or water erosion. After stripping and stockpiling the soil materials, minor grading will be completed to establish the drill pad and accommodate the drilling and support equipment. Runoff and sediment contributions from the soil material stockpile will be controlled through placement of a silt fence, a rigid silt barrier, and/or straw wattles, and a short diversion ditch discharging through a rock-lined sump.

Mud pits may be constructed within the graded pad area. The size of the required pits will be dependent on drilling depths and conditions. Materials excavated from the pits will be stockpiled on the margins of the pad area and used to backfill the pits after the drilling is completed. All drilling fluids will be contained within the mud pits, and all drilling supplies will be contained within the area of the drill pad. Any runoff and associated suspended sediment from the drill pads will be controlled and contained by the diversion ditch on the downgradient side(s) of the drill pad. On completion of drilling, the boreholes will be cased and grouted, the mud pits will be allowed to dry out and will be backfilled, and the pad surfaces and road will be graded and surfaced with gravel. Construction drainage controls (wattles, silt fence, or similar) will be used during pipeline excavation and placement to control runoff and sediment, and the pipeline trench will be progressively backfilled and graded as pipeline installation proceeds. The pads, road, and pipeline, and associated drainage control measures will be maintained during active use, and all disturbance will be reclaimed when no longer needed to support ongoing or anticipated future mining operations.

**<u>Proposed Reclamation Methods</u>**: Under the required CDRMS Revision approvals, the suretybond coverage in place with the Mined Land Reclamation Board is adequate to assure that the reclamation obligations are fulfilled. The following sections describe the specific proposed reclamation practices to be used to return areas disturbed by the borehole and pipeline activities to a stable condition and productive use.

<u>Borehole Plugging, Sealing, and Abandonment:</u> The boreholes will be plugged, sealed, and abandoned. The boreholes will be plugged with Cement and grouted to the top. The borehole will be cut off 3 feet from the surface elevation and buried. This will effectively plug and seal all coal beds and potential groundwater aquifers to prevent vertical groundwater migration and hydraulic communication between aquifers.

The reclaimed borehole locations will be marked with either a steel fence-post or a metal survey cap at or below ground level. The borehole locations will be accurately surveyed, and distinctly numbered, allowing for future identification. Abandonment reports will be prepared and filed, as required by applicable regulations.

<u>Road, Pad Areas, and Pipeline Reclamation:</u> On completion of any active use, the boreholes will be plugged, sealed, and abandoned, as previously described, and the remaining surface disturbance will be reclaimed. In accordance with Rules 2.02.2(2)(f) and 4.21.4(4), access road disturbance, excavations, artificial flat areas, and embankments created during construction or drilling will be returned to their original contour through backfilling and grading and soil materials will be replaced on regarded areas. Pipeline reclamation will involve cutting the pipeline off below grade and plugging the ends, abandoning the remaining pipeline in-place, removing inspection manholes, and backfilling, grading, and replacing soil materials on the manhole locations. Seeding of the reclaimed sites will occur during the first favorable seeding period (typically late fall [preferred], or early spring) following completion of site reclamation. The following summarizes the steps and general sequence for site reclamation:

1) On completion of activities at a given site, all trash, debris, and drilling equipment and supplies will be removed from the site

2) Drilling fluids in mud pits will be allowed to dry, or they may be pumped from the mud pits for off-site disposal. Mud pits or excavated trenches will be backfilled with the excavated material and compacted to minimize any settling. Any excess drill cuttings will be spread over the drill pad, and any the access road and drill pad will be regraded and gravel surfaced.

3) On completion of use, gravel surfacing material will be removed from the road and pads, and the road and pads will be regraded to approximate their original configuration and blend with the adjacent terrain. Manholes will be removed, and the associated disturbance areas will be backfilled and regarded.

4) Stockpiled soil materials will be redistributed at a uniform thickness over disturbed areas

5) Disturbed areas will be reseeded to stabilize the surface and control erosion using a seed mixture developed in consultation with the surface landowner and CPW. Soil materials will be scarified prior to seeding, and areas will be drill or broadcast seeded at the prescribed rates. A harrow or similar implement will be used to drag the surface and cover the seed following seeding.

The following seed mixture will be used to reseed and revegetate the Borehole and Pipeline disturbances:

Rangeland mixture:	
<u>Species</u>	PLS lbs/acre
Thickspike wheatgrass (Critana)	1.0
Mountain brome (Bromar)	2.0
Western wheatgrass (Arriba)	2.0
Slender wheatgrass (San Luis)	2.0
Bluebunch wheatgrass (Secar)	1.0
Basin wildrye (Trailhead)	2.0
Orchardgrass (Paiute)	0.25
Green needlegrass (Lodorm)	2.0
Canada bluegrass (Ruebens)	0.10
Sheep fescue (Covar)	0.25

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MR21-319 & TR21-97

Big bluegrass (Sherman)	0.25
Alfalfa (Falcata)	0.10
Rocky Mtn. penstemon (Bandera)	0.25
Palmer penstemon (Ceder)	0.10
Blue flax (Appar)	0.50
Arrowleaf balsaroot (Native)	0.50
Tailcup lupine (Native)	1.0
Yarrow (Native)	0.10
Pacific aster (Native)	0.10
Chokecherry (Native)	1.0
Serviceberry (Native)	0.50
Mountain snowberry (Native)	0.50
Antelope bitterbrush (Native)	<u>1.0</u>
Total PLS	18.5 (double for broadcast seeding)

The rangeland seed mixture has been used to seed mine disturbance areas, and lends itself to rapid and long-term surface stabilization, ease of establishment, maximum use of native species, high levels of utility for livestock and wildlife, good forage production potential, compatibility with naturally regenerating native species present in replaced topsoil and the ability to be selfsustaining. CPW has requested that TC add mountain big sagebrush (*Artemisia tridentate Ssp. vaseyana*) in the rangeland seed mixture (0.25 PLS/acre).

TC will monitor the reclaimed boreholes and pipeline disturbance for noxious weeds and, if necessary, implement treatment to control any noxious weeds in accordance with CDRMS guidelines and the County Weed Management Plan.

## MAPS

7East Cross Entry Grout Borehole 18LT Dewatering Borehole and Pipeline



# Legend

# Layer

- ----- PAD SITE
- ------ TWENTYMILE LIGHT ACCESS ROAD
- ------ WATER-LINES
- ------ 7EAST PAD SITE
- —— County Roads
  - Township/Range
    - Sections



## TWENTYMILE COAL, LLC



#### 29515 RCR #27 OAK CREEK, CO 80467

MR21-319 & TR21-97 LOCATION MAP					
DESIGNED BY: MLK	COUNTRY: USA				
DRAWN BY: MLK	STATE/PROVINCE: COLORADO				
APPROVED BY:	GSC: 5N 87W				
DATE: 2021-07-27	DRAWING/SHEET: 1 of 1				
SCALE:	C.I.: 0'				



# Legend

7E Cross Entries Location

- Existing Road: 3500 Feet
- New Road: 2800 Feet
- PAD: 450'x 450'
  - Twentymile Light Use Roads
  - Sections





#### TWENTYMILE COAL, LLC 29515 RCR #27 OAK CREEK, CO 80467

7 East Cross Entry Pad Location Map						
DESIGNED BY: MK DRAWN BY: MK APPROVED BY:	COUNTRY: USA STATE/PROVINCE: COLORADO GSC: 5N 86W					
DATE: 2021-09-02 DRAWING/SHEET: 1 of 1 SCALE: 0'						





APPENDIX A

# MAILING LABELS FOR LANDOWNER NOTIFICATIONS

Chance Revocable Living Trust PO Box 119 Ballico, CA 95303-0119

Jason & Brandy Patrick 959 Sheerlund Rd Reading, PA 19607

State of Colorado Board of Land Commissioners 1127 Sherman Street, STE 300 Denver, CO 80203

Grassy Creek Ranch LLC 402 Hickory Hill Road Chadds Ford, PA 19317 John & Hillary Rice 30155 County Road 37 Hayden, CO 81639-9622

Myron Walker US Bank Real Estate Tax Dept Box 64142 St. Paul, MN 55164-0142

William Mitzelfeld 19345 Raptor Road Hayden, CO 81639

Salt River Project PO Box 52025 Phoenix, AZ 85072 Sage Creek Land & Reserves, LLC 701 Market Street, STE 862 St. Louis, MO 63101

Camilletti & Sons, Inc HCR 66 PO Box 69 Steamboat Springs, CO 80487-9804

Larry & Elise Layne 15181 E Weldon AVE Sanger, CA 93657

## APPENDIX B CULTURAL RESOURCE INVESTIGATIONS REPORT

## LIMITED-RESULTS CULTURAL RESOURCE SURVEY FORM

(Page 1 of 6)

This form (#1420) is for small scale limited results projects - block surveys less than 160 acres with linear surveys under four miles. Additionally, there should be no sites and a maximum of four Isolated Finds. This form must be typed.

## I. IDENTIFICATION

- 1. Report Title (include County): <u>Peabody / Twentymile Coal, LLC: Class III Cultural Resource</u> Inventory of the Proposed 7E Cross Entries, Routt County, Colorado
- 2. Date of Field Work: July 20, 2021
- 3. Form completed by: <u>Garrett Williams</u> Date: <u>July 23, 2021</u>
- 4. Survey Organization/Agency: <u>Metcalf Archaeological Consultants, Inc.</u> Principal Investigator: <u>Melissa Elkins</u>

Melissa Elkins

Principal Investigator's Signature: \_

Other Crew: Garrett Williams

Address: 3094 I-70 Business Loop, Suite B, Grand Junction, CO, 81504

- Lead Agency / Land Owner: <u>Colorado Division of Reclamation, Mining, and Safety</u> (CDRMS); private surface with federal mineral ownership (BLM, LSFO)
   Contact: <u>Tabetha Lynch, Division of Natural Resources, CDRMS</u> Address: tabetha.lynch@state.co.us
- 6. Client: <u>Peabody / Twentymile Coal, LLC</u>
- 7. Permit Type and Number: <u>BLM permit #C39290 (expires 10/01/2022)</u>
- 8. Report / Contract Number:\_\_\_\_\_
- 9. Comments: <u>Metcalf consulted with Bureau of Land Management Little Snake Field</u>

Office (BLM-LSFO) prior to fieldwork for this project. BLM-LSFO deferred review to

CDRMS.

# **II. DESCRIPTION OF UNDERTAKING / PROJECT**

- 10. Type of Undertaking: <u>7E Cross Entries location</u>
- 11. Size of Undertaking (acres): <u>9.02 acres</u> Size of Project (if different) <u>9.02 acres</u>
- 12. Nature of the Anticipated Disturbance: <u>The 7E area will be used for a cement grout</u> <u>Borehole Pad located over the 7 East Cross Entries in the Wolf Creek seam. The</u> <u>borehole pad site will be used to pump cement grout into the 7 East Cross Entries to</u>

allow the longwall to safely mine through the cross entries. After the complete of the grouting the borehole will be used to place a rock dust tank and rock dust drop in to the mine.

13. Comments: <u>Metcalf completed Class III cultural survey of a 9.02-acre block, which is</u> <u>defined as the area of potential affect (APE) for the project.</u>

# III. PROJECT LOCATION

Please attach a photocopy of USGS Quad. clearly showing the project location. The Quad. should be clearly labeled with the Prime Meridian, Township, Range, Section(s), Quad. map name, size, and date. Please do not reduce or enlarge the photocopy.

14. Description: <u>Project area is in Twentymile Park, about 1/8-mile east and south of a bend</u> <u>in Fish Creek. Twentymile Park is a synclinal basin within the Wyoming Basin physiographic</u> <u>province in northwestern Colorado (Fenneman 1946; Johnson et al. 2000).</u>

15. Legal Location: Quad. Map: <u>Milner</u> Date(s):<u>1971 (PR 1973)</u>

Principal Meridian: 6th X NM Ute

NOTE: Only generalized subdivision ("quarter quarters") within each section is needed

Township: 5N Range: 86W Sec.: 16 1/4s SW/SW

Township: <u>5N</u> Range: <u>86W</u> Sec.: <u>21</u> 1/4s <u>NW/NW</u>

If section(s) is irregular, explain alignment method:

16. Total number of acres surveyed: <u>9.02 acres</u>

17. Comments:

# IV. ENVIRONMENT

18. General Topographic Setting: <u>The project area consists of a nearly square parcel</u> <u>situated on a level bench just east and south of a bend in Fish Creek in Twentymile Park</u> (Figures 1 and 2).

Current Land Use: <u>open pasture with coal mining infrastructure visible in the</u> <u>surrounding area</u>

19. Flora: <u>Sage steppeland with low sagebrush, native bunchgrasses, various forbs.</u>

20. Soils/Geology: <u>The surficial geology of the project area is mapped as residual</u> <u>bedrock units associated with Lewis Shale and the Mesaverde Group (Madole 1989). Soils</u> <u>mapped within the project area consist solely of the Impass Series silty clay loam, 3 to 12</u> <u>percent slopes (USDA NRCS Soil Survey 2021). The Impass Series develop within</u>

### Limited-Results Archaeological Survey Form (Page 3 of 8)

colluvium and/or slope alluvium derived from local sandstone and shale bedrock units. A dry gravish brown silty clay with very few gravels was observed during the survey. 21. Ground Visibility: Ground visibility ranged from fair to good, dependent on the density of grasses and sagebrush.

22. Comments:

## V. LITERATURE REVIEW

23. Location of File Search: Colorado OAHP Date: July 15, 2021

24. Previous Survey Activity - In the project area: Two previous surveys overlap with the current project area. Survey RT.CM.R3 covers the entire northern half of the project area. This inventory was conducted by Metcalf in 2000 for Twentymile Coal subsidence areas. Secondly, inventory RT.LM.R53 is a linear survey that crosses the western edge of the current APE. It was conducted by Metcalf in 2001 for Cyprus Twentymile Coal for various facilities, including vent shafts and an access road. None of the current project area was precluded due to previous inventory, due to the age of these previous studies.

In the general region: A very large number of inventories have been conducted in the region, including 36 within one-mile of the project area. Nearly all are associated with coal mining, energy extraction, or energy transport. These range widely in size from a few acres to large block and linear inventories.

25. Known Cultural Resources - In the project area: One previously recorded site, 5RT921, traverses east-west across the southern portion of the current project area. This site is a historic earthen irrigation ditch that has been officially assessed as not eligible to the NRHP under any criteria.

In the general region (summarize): According to OAHP data, 19 cultural resources (sites and isolated finds) are located within one-mile of the project area. The isolated finds are largely prehistoric. The sites consist of a mix of historic and prehistoric and include prehistoric lithic scatters and camps, and historic habitation, agricultural complex, and debris scatter sites.

26. Expected Results: Given the largely negative results from prior surrounding and overlapping inventories, few resources were anticipated.

# VI. STATEMENT OF OBJECTIVES

27. Following state and federal policies and regulations implementing the NHPA (Public Law 89-665) as amended, the project area was inventoried to identify, record, and evaluate for NRHP-eligibility any cultural resources within the APE.

## **VII. FIELD METHODS**

28. Definitions: Site Locus of previous (50 year age minimum) human activity at which the preponderance of evidence suggests repeated and patterned use over time, or multiple classes of activities.

IF One or more culturally modified and transportable objects representing a single activity and not found in the context of a site as defined above

29. Describe Survey Method: One archaeologist walked pedestrian transects spaced no more than 20-m apart across the entire project area. In-field navigation of the inventory area was conducted via GIS data on a handheld Trimble GeoXT 6000 GPS unit with realtime WAAS correction of approximately 2 to 5 meters and post-processed correction to submeter. In addition, special attention was given to areas of enhanced ground visibility such as rodent burrows, road and ditch cuts, and stock trails.

# VIII. RESULTS

30. List IFs if applicable. Indicate IF locations on the map completed for Part III.

- A. Smithsonian Number: \_\_\_\_\_ Description: \_\_\_\_\_
- B. Smithsonian Number: \_\_\_\_\_\_Description: \_\_\_\_\_
- C. Smithsonian Number: \_\_\_\_\_ Description: \_\_\_\_\_
- D. Smithsonian Number: Description:

No isolated finds were discovered. One previously recorded historic irrigation ditch was revisited, site 5RT921. This site has an official NRHP determination of Not Eligible. Metcalf observed no changes to the ditch from prior recordings and recommends that it continue to be managed as not eligible for inclusion on the NRHP under any criteria. No further work is recommended for this project.

31. Using your professional knowledge of the region, why are there none or very limited cultural remains in the project area? Is there subsurface potential?

<u>The project area is limited in size, and is situated along a low bench without significant</u> <u>overlooks or a prominent viewshed</u>. Inspection of exposed sediments along an irrigation <u>ditch and spoil pile and cutbanks along natural drainages revealed no suggestion of</u> subsurface cultural materials.

# **REFERENCES CITED**

## Fenneman, Nevin

1946 *Physical Divisions of the United States.* United States Geological Survey, Reston, Virginia.

Johnson, Edward A., Laura N.R. Roberts, Michael E. Brownfield, and Tracey J. Mercier
 2000 Geology and Resource Assessment of the Middle and Upper Coal Groups in the
 Yampa Coal Field, Northwestern Colorado. *Geologic Assessment of Coal in the Colorado Plateau: Arizona, Colorado, New Mexico, and Utah*, edited by M.A.
 Kirschbaum, L.N.R. Roberts, and L.R.H. Biewick. U.S. Geological Survey Professional
 Paper 1625-B

Madole, R.R.

1989 Surficial Geologic Map of the Meeker 30' X 60' Quadrangle, Garfield, Moffat, Rio Blanco, and Routt Counties, Colorado. U.S. Geological Survey, Miscellaneous Investigation Series Map I-1823, scale 1:100,000.

Tweto, Ogden

1979 Geologic Map of Colorado. U.S. Geological Survey, Denver.

United States Department of Agriculture

2021 National Resources Conservation Service Colorado Soil Survey Program website. Electronic document, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed on

http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed on 07/23/2021.



**Figure 1.** Project area overview facing northeast from southwest corner (Roll 21-808, image 20).



**Figure 2**. Project area overview facing southwest from northeast corner; the southwest corner is by the scarcely visible vehicle near center of photo (Roll 21-808, image 21).



Project Location Map

# ATTACHMENT A

Cultural Resource Survey Forms

For Official Use Only: Disclosure of site locations prohibited (43 CFR 7.18)

#### COLORADO CULTURAL RESOURCE SURVEY Cultural Resource Re-Visitation Form

OAHP1405 Rev. 11/10

A F Foi lan cha cha fori cha	<ul> <li>Re-Visitation Form can only be used when a Management Data orm and component forms have been previously filed with the nd managing agency and/or the Colorado Office of Archaeology and Historic Preservation and no substantive changes to the paracter of the site are required as a result of the current resistation. Please use the Management Data Form and supporting rms (archaeological component, linear, vandalism, etc.) when panges are required to: <ul> <li>Site type</li> <li>Linear resources</li> <li>Additional artifact assemblages and/or features</li> <li>Boundary size</li> <li>Vandalism</li> <li>NRHP recommendations</li> </ul> </li> </ul>	Official determination (OAHP use only)  Determined Eligible NR\SR Determined Not Eligible NR\SR Nominated Need Data NR\SR Contributing to NR Dist.\SR Dist. Not Contributing to NR Dist.\SR Dist. Supports overall linear eligibility NR\SR Does not support overall linear eligibility NR\SR					
1. I 3. I	Resource Number:5RT921.42. TemporarResource Name:	ry Resource Number:					
4. <b> </b> 5. ( 6. (	<ul> <li>Project Name/Number: Peabody / Twentymile Coal, LLC: Class III Cultural Resource Inventory of the Proposed 7E Cross Entries, Routt County, Colorado</li> <li>Government Involvement: Local State Federal Agency: BLM, LSFO owned subsurface minerals; private surface</li> <li>Site Categories: (Check as many as apply) Prehistoric: Archaeological site Paleontological site In existing National Register District? Yes No Name: Local Landmark? Yes No Name: Historic: Archaeological site Building (s) Structure(s) Object(s)</li> </ul>						
7. ( 8. \	In existing National Register District?       Yes       No       Name:         Local Landmark?       Yes       No       Name:         Owner(s) Name and Address:       Private; Twentymile Mine         Was the site relocated?       Yes       No       If no, why? (100% colle	cted in previous recording, ground disturbance,					
_	etc.)						

#### 9. Previous recordings:

The site was initially documented by Metcalf in 1993 (Barclay 1993), and was subsequently revisited and expanded by Metcalf in 1999 (Graham 1999). It was originally described as an abandoned historic irrigation ditch measuring approximately one-mile long, 3 to 4 m wide, and 0.5 to 0.75 m deep with no known associated features. The site was recommended as not eligible because it lacked significant attributes and was not known to be associated with significant historical figures or events. In 1999, Metcalf revisited the site and expanded the segment west for a total length of about 9,000 ft. The newly expanded segment measured 2 to 3 m wide and 30 to 60 cm deep. It was described as being partially filled with sediment, overgrown with grasses, and impacted by cattle traffic. An inquiry at the Colorado Water Resources office in Steamboat Springs yielded no record of a ditch filing in the area and no record of water appropriation was found. The site was once again recommended as not eligible.

10. <b>Most recent National</b> Explain:	Register Eligibility	Assessment	:: 🗌 Eligible	e 🛛 Not Elig	jible 🗌 Nee	d Data
11. Listed on Register: Date Listed:	National	State	🛛 None			
12. Condition (describe):	Site is in generally	good conditio	n			
13. Threats to Resource:	Water Eros	ion	Wind Erosion ify):	🛛 Grazing	Neglect	□Vandalism
14. Existing Protection:	None	Marked	Fenced	Patrolled	Access co	ontrolled
		-				

Other (specify):

Comments:

15. Recorder's Management Recommendations: No further work is recommended

#### 16. Known Collections, Reports, or Interviews:

Barclay, Dulaney

1993 Cyprus Twentymile Coal Company Foidal Creek Mine Class III Cultural Resource Inventory, Routt County, Colorado. Metcalf Archaeological Consultants, Inc. Report on file at the Colorado Office of Archaeology and Historic Preservation, Denver, Colorado.

Colorado Department of Natural Resources-Division of Water Resources (DWR)

2021 Records for the Corliss Ditch, including decree (WDID 5700515). Available online at https://dwr.state.co.us/Tools/WaterRights/Transactions, accessed July 26, 2021.

Graham, Carole

1999 Intensive Cultural Resource Inventory for Cyprus Twentymile Coal Company's Proposed 9904 Seismic Line, Routt County, Colorado. Metcalf Archaeological Consultants, Inc. Report on file at the Colorado Office of Archaeology and Historic Preservation, Denver, Colorado.

17. **Site Description/Update**: Metcalf revisited previously recorded historic earthen irrigation ditch site 5RT921 during the current project. It was initially recorded, and subsequently expanded, by Metcalf in 1993 (Barclay 1993) and 1999 (Graham 1999). It was later ascribed Segment # 1, after additional segments of the ditch were identified to the east. This revisit form solely reflects a revisit to a 980-foot long portion of the ditch initially recorded in 1993. The linear site stretches generally east/west along benches and gentle north-facing slopes south of Fish Creek. Surface sediments consist of a fine-grained grayish brown silt or silty clay with sparse subrounded gravels and cobbles. The area is used for open grazing and is vegetated by low sagebrush steppeland with mixed grasses and various forbs.

Metcalf's recent revisit to the site revealed it to be in essentially the same condition as originally described, namely it manifests as a well-defined earthen irrigation ditch about 0.5 m deep and 3 m wide with a prominent spoil pile located along its north side. No historic artifacts or features were found in association. It is crossed in numerous places by stock trails and a stock trail parallels the ditch along the top of the berm.

Previous investigations at the site suggested that the ditch may be a somewhat recent construction, perhaps mid 20<sup>th</sup> century, although records searches were not fruitful. It is not depicted on any known historic or modern maps of the area. However, based on a recent search of information available in the CDSS Water Rights online database, and an inspection of aerial maps on which the ditch is visible, it appears likely that the ditch is the Corliss ditch, which has a headgate on the south side of Fish Creek in T 5N R 86W, SW ¼ of NW ¼ of Section 20. This is not a conclusive identification, however, because there is a gap apparent on aerial maps between the ditch and the mapped location of the headgate. The gap corresponds with a fence line and evidence of substantial stock trails, which may have obliterated the ditch in this area. Regardless, the Corliss ditch has an appropriation date of November 18, 1953, at a maximum decreed rate of 6.0 cubic feet per second (cfs). It has an adjudication date of November 15, 1962, (DWR 2021).

The entire site was originally recommended as not eligible for inclusion on the NRHP based on the lack of information available and the likely younger age of the ditch, a recommendation that was officially determined in 1993 by CO OAHP. In addition, a recent search of CDSS Water Rights database appears to confirm the assumption of the ditch as a mid 20<sup>th</sup>-century construction, which further bolsters the NRHP recommendation of Not Eligible. In sum, Metcalf recommends that irrigation ditch site 5RT921 continue to be managed as not eligible for inclusion on the NRHP under any criteria. No further work is recommended.

#### 18. Photograph Numbers: 21-808, images 22-24

Digital files at: Metcalf Archaeological Consultants, Eagle, CO

19. Artifact and Field Documentation Storage Location: Metcalf Archaeological Consultants, Eagle, CO

20. **Report Title**: Peabody / Twentymile Coal, LLC: Class III Cultural Resource Inventory of the Proposed 7E Cross Entries, Routt County, Colorado

**Resource Number**: 5RT921.4

- 21. Recorder(s): Garrett Williams Date: July 20, 2021
- 22. **Recorder Affiliation**: Metcalf Archaeological Consultants, Inc. Phone Number/Email: 970-328-6244/mac@metcalfarchaeology.com

# Note: Please attach a sketch map, a photocopy of the USGS quad. map indicating resource location, and photographs.

Colorado Historical Society – Office of Archaeology & Historic Preservation 1200 Broadway, Denver, CO 80203 303-866-3395

#### SITE PHOTOS



5RT.921.4 Overview of ditch facing northwest from east end of revisited segment; note ditch to left and stock trail following berm on right (Roll 21-808, image 22).



5RT.921.4 Overview of ditch facing southeast from west end of revisited segment (Roll 21-808, image 23).

#### SITE SKETCH MAP



#### SITE LOCATION MAP



# **APPENDIX C**

# WEED MANAGEMENT PLAN

# **Twentymile Coal, LLC** Administrative Permit for Coal Exploration

# Weed Management Plan



*Noxious Weed Management Program* - Noxious weed infestations may occur on areas disturbed from site disturbance activities. In order to minimize potential adverse resource impacts that may result from noxious weed infestations; optimize revegetation success for the reclaimed areas; and fulfill sound land management objectives, Twentymile Coal, LLC (TC) will incorporate the following integrated noxious weed management program (weed program) from the approved CDRMS (Colorado Division of Reclamation, Mining, and Safety) permit.

TC's weed program is designed to effect full compliance with applicable provisions of CDRMS Rule 4.15.1(5), and was developed with reference to the Colorado Weed Management Act (CRS 35-5.5-115), the CDRMS's "Guideline for the Management of Noxious Weeds on Coal Mine Permit Areas", and in consultation with the local office of the Colorado State University Cooperative Extension Service (CSU-Extension Service, also the Routt County Weed Control agency). TC's weed program focuses on those noxious weed species listed by the Colorado Department of Agriculture, and will be modified, as appropriate to address any changes to this list. TC's integrated weed program consists of five interrelated components, as detailed in the following sections: Prevention, Identification and Mapping, Management Planning and Scheduling, Application of Selected Control Method(s), and Evaluation of Control Effectiveness.

*Prevention* - Prevention is the most important component of TC's weed program and includes the following items.

- Re-seed disturbed areas in a timely manner following site grading and soil material replacement using the methods outlined in Section 2.05.4, Reclamation Plan
- Develop and use seed mixtures which replicate native plant communities and encourage rapid vegetative reestablishment
- Plant only certified weed-free seed for the approved seed mixes
- Assess the need for any supplemental management measures. (ie: fertilization, reseeding, weed control, protection from wildlife, etc.) to assure effective vegetative reestablishment
- Wash off-road vehicles that are moving between different areas to minimize unintentional transport of noxious weed seed
- Minimize noxious weed propagation by treating any noxious weed infestations prior to seed-head maturation using mechanical, chemical, or biological controls, or a combination of these methods
- Monitor and evaluate weed control efforts on an annual basis as described in the following sections

*Identification and Mapping* - TC will utilize a range of resources to identify and map any noxious weed infestations within the TC Permit Area. Mine Environmental Staff is trained in noxious weed identification and, as a matter of practice, note any noxious weed occurrences observed any time they are in the field. In addition, Mine Environmental Staff, assisted by trained student and summer interns, will conduct spring and fall Environmental Management surveys of active areas, specifically to assess the condition of mine drainage structures, identify any new noxious weed occurrences, assess the effectiveness of weed management activities, and note any other environmental concerns that may require attention. TC maintains a working weed program map and records both observed noxious weed occurrences (from all sources, by weed species, location, and extent of infestation) and treatment activities.

*Management Planning and Scheduling* - Effective management and planning are key elements in assuring the effectiveness of TC's noxious weed control program. Any new information collected through the ongoing noxious weed identification and mapping efforts, along with treatment information from prior years is reviewed and evaluated. Based on this information, treatment strategies and schedules are developed during the early spring for the annual weed management program using the following steps:

- For mapped weed infestations, treatment methods are determined based on the weed species present using recommendations provided by the CSU Extension Service. Selection of treatment method(s) takes into consideration proximity to flowing water or water bodies, croplands, any livestock use, and historical response of identified weed species to prior treatment(s), based on review of control effectiveness. Treatment methods may include mechanical controls (tillage, mowing, burning, cutting/pulling), chemical controls (selective herbicides), biological controls (weed-specific insects or pathogens), or combinations of these methods. In general, treatment method(s) will be selected to achieve the most effective control with the resources available. As an example, where multiple weed species are present, the most effective overall control(s) will be applied, although the method(s) may not be optimal for each individual species.
- Scheduling of weed management treatments will also be based on the CSU Extension Service recommendations for specific weed species. For most species, control effectiveness can be significant enhanced by scheduling treatment at specific stages of vegetative growth (typically spring and/or fall). To the extent possible, based on staff and contractor availability, treatment will be scheduled to optimize effectiveness.
- Priority and responsibilities for weed control are determined based on weed species present and the location and extent of weed infestations. Certain weed species are extremely aggressive, and first priority will be given to their control to prevent establishment and spread. Previously treated areas are second in priority, in order to maximize control effectiveness. Third in priority are any new weed infestations and areas where the weed infestation covers a large area, to prevent further spread. Lowest priority is given to isolated weed infestations of non-aggressive species which have not been previously treated, since these may be addressed by natural vegetative succession and pose a reduced risk of spread. Generally, grazing lessees are responsible for weed control on their lease areas, with TC sharing control costs and providing oversight, under the terms of the lease agreements. TC is responsible for weed control on remaining areas. All weed management activities (both TC and grazing lessee) follow the general priorities, as outlined above.

*Application of Selected Control Method(s)* - The following summarizes the proposed treatment methods for listed noxious weed species known to occur within the TC permit area. If treatment extends over a longer time period, or if control effectiveness is determined to be lower than anticipated, treatment methods or chemicals may be adjusted to improve long-term effectiveness. Approved or more effective chemicals for targeted weeds may change over time and these modifications will be incorporated, as appropriate.

Routt County Noxious Weed list:

- Yellow toadflax/butter and eggs Spring spot spraying with Tordon (Banvel is alternative chemical)
- Hounds-tongue Spring spraying (full coverage and spot) with mix of Escort, 2,4-D amine, and Activator 90 (Plateau is alternative chemical)

Colorado State Noxious Weed A and B lists:

- Bull thistle Cutting/pulling prior to formation of seed-heads and then fall spraying with mix of Tordon, 2,4-D amine, and Activator 90 (Banvel and Curtail are alternative chemicals)
- Musk thistle Cutting/pulling prior to formation of seed-heads and then fall spraying with mix of Tordon, 2,4-D amine, and Activator 90 (Banvel and Curtail are alternative chemicals)
- Canada thistle Cutting/pulling prior to formation of seed-heads and then fall spraying with mix of Tordon, 2,4-D amine, and Activator 90 (Banvel and Curtail are alternative chemicals)
- Hoary cress (white top) Spring spraying (full coverage and spot) with mix of Escort, 2,4-D amine, and Activator 90 (Plateau is alternative chemical),

For large areas or significant weed infestations, TC may utilize a weed-control contractor to achieve overall control (typically over several years) and then utilize in-house resources (Environmental Staff, student interns, summer students, contract labor) for ongoing maintenance control activities. TC maintains both a pick-up and an ATV with spray-tanks, spray bar (ATV only), and hand-sprayers, as well as several backpack tank sprayers for weed control. Chemical control activities are overseen by a U.S.-EPA Certified Pesticide Applicator, and pesticide storage, handling, and use procedures and personal protective equipment are utilized to prevent potentially hazardous personal or environmental exposures. Where control of extensive weed infestations results in limited vegetative cover or bare-ground, the affected area will either be inter-seeded or ripped and seeded, dependent on site-specific conditions. Certain areas where there may be a flammability hazard or where specific Mine Safety and Health Administration (MSHA) regulations apply may be treated with a long-lasting broad-spectrum herbicide such as Arsenal, Roundup, Sahara, or Throttle.

Table 1 summarizes controls, rates, and timing for weeds identified in the TC Permit Area and adjacent areas under TC's control:

SPECIES	HERBICIDE	RATE	TIMING
	2,4-D Amine/ Low Vol	<sup>1</sup> / <sub>2</sub> pt./ac	Spring
Black henbane	Ester 6 Banvel	½ pt./ac	Fall
Bull thistle	2,4-D, Tordon Banvel	<sup>1</sup> / <sub>2</sub> pt/ac <sup>1</sup> / <sub>2</sub> pt./ac	Spring* Fall
Canada thistle	2,4-D, Tordon Banvel Escort	<sup>1</sup> / <sub>2</sub> pt/ac <sup>1</sup> / <sub>2</sub> pt./ac 2 oz./ac	Spring Fall Spring *
Common cockleburr	Grazon P&D 2,4,D	2 pt./ac ½ pt./ac	Spring*
Common mullein	Grazon P&D Escort 2 oz/A	4 pt./ac + surfactant**	Spring
Curly cup gum weed	Grazon P&D 2,4D LV 6	2 pt./ac 1 lb. /ac	Spring
Curly dock	Grazon P&D Tordon	2 pt./ac + surfactant**	Spring
Dalmatian toadflax	Tordon 2,4-D Escort	2 qt./ac 1 lb./ac + surfactant**	Spring
Field bindweed	2,4, D	1 lb./ac	Spring
Kochia	2,4-D	<sup>1</sup> / <sub>2</sub> pt./ac	Spring
Leafy spurge	Tordon	2 qt./ac	Spring
Perennial pepperweed	Escort	2 oz./ac	Spring
Russian olive	Garlon 4	5%	Stump treatment spring
Russian thistle	2,4 D	<sup>1</sup> / <sub>2</sub> pt./ac	Spring
Scotch thistle	2,4-D Tordon Banvel	<sup>1</sup> / <sub>2</sub> pt./ac <sup>1</sup> / <sub>2</sub> pt./ac	Spring Fall
Tamarisk. Salt Cedar	Garlon 4	5%	Stump treatment
Yellow toadflax	Tordon 2,4-D	2 qt./ac 1 lb./ac + surfactant**	Spring
Whitetop, Hoary Cress	Escort 2,4-D	2 oz/ac ½ pt./ac	Spring
Bare ground treatment substations and explosive storage	Arsenal	20 lb/ac Pellets	Spring for total vegetation control per safety regulations.

## TABLE 1 – CHEMICAL CONTROL METHODS

## SPOT TREATMENT MIXING (see label instructions for specific species)

- 1% Solution in 100 Gallons = 1 gallon of Chemical
- 1% Solution if 3 Gallons = 3.8 oz = 11.5 Tbsp = 114 ml
- 1% Solution in 1 Gallon = 1.3 oz = 4 Tbsp = 39 ml
- 2% solution in 1 Gallon = 2.5 oz. 8 Tbsp = 75 ml
- Escort package contains a measuring funnel. Use a <sup>1</sup>/<sub>4</sub>% mixture for spot spraying.

*Evaluation of Control Effectiveness* - Generally, in conjunction with the spring Environmental Management surveys, areas of previously identified and treated noxious weed infestations are inspected and the effectiveness of control measures is evaluated based on reduction or elimination of weed infestations. TC's grazing lessees and any weed-control contractors also provide similar information, based on their field observations. This information is utilized in the management planning process to determine the need for continued treatment and to modify treatment method(s), if indicated, to improve their effectiveness.

TC will provide Routt County with documentation from the Annual Reclamation Report pertaining to weed control and submit any significant changes to specific weed control plans (chemicals, rates, and timing) to the Routt County Weed Supervisor for review prior to weed control activities.