This chapter describes the process used to develop the proponent's Proposed Action and the additional alternatives that have been considered, including the alternative of no action.

2.1 ALTERNATIVES DEVELOPMENT PROCESS

This Draft Environmental Impact Statement (DEIS) has been prepared in compliance with the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) (40 *Code of Federal Regulations* [CFR] 1500-1508). According to CEQ guidelines, "Reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (CEQ 1981). Additionally, the CEQ requires an explanation of why other alternatives considered were eliminated from detailed study (40 CFR 1502.14). For the U.S. Bureau of Land Management (BLM), any alternatives considered must either be consistent with the Grand Junction Field Office Resource Management Plan (RMP) (BLM 1987) and the North Fruita Desert Management Plan (NFDMP) (BLM 2004) or meet requirements to amend these plans.

Alternatives are developed based on the applicant's Proposed Action. The objective is to determine if there are reasonable alternatives that meet the purpose and need for the project and that could implement the Proposed Action in a less environmentally damaging manner. Alternatives are also developed in response to input received from public and agency scoping. Alternatives that have no obvious advantages, are not practicable, or are unreasonable from a development or cost basis are not carried through the DEIS for detailed study.

2.1.1 Agency Coordination

The BLM conducted early coordination with the Sacramento District of the U.S. Army Corps of Engineers (USACE) and other agencies and local entities including the Office of Surface Mining, Reclamation, and Enforcement (OSM), the U.S. Fish and Wildlife Service (USFWS), Colorado Division of Wildlife (CDOW), Colorado Division of Reclamation, Mining, and Safety (DRMS), U.S. Bureau of Reclamation (BOR), City of Fruita, Mesa County, Garfield County, Colorado State Parks, and the Colorado Department of Transportation (CDOT) to assure involvement of participating and cooperating agencies.

2.1.2 Project Component Alternatives

The Proposed Action includes a number of components/facilities (Section 1.2, Background) required to meet the purpose of mining and selling coal. Alternatives to individual project components were developed to determine if they could be used to meet the purpose and need, were practical and feasible, and reduced environmental impacts and/or addressed public and agency concerns. Some of the component alternatives examined were suggested during public scoping for the project (BLM 2006). A wide range and variety of alternatives were examined, with a focus on the following issues:

- Means of transporting the coal
- Coal transportation routes and delivery locations
- Means and routes for delivering the required electrical power to the mine facilities

- Sources and routes for delivering the water to the mine facilities
- Means or locations for disposing of waste rock
- Future coal lease area
- Location of the mine portal
- Methane venting

Alternatives that would address each of these issues are discussed in the following sections.

2.2 MEANS OF TRANSPORTING THE COAL

The coal must be moved approximately 15 miles, from the mine area near the Mesa County and Garfield County line, south to the existing Union Pacific Railroad (UPRR) line that runs past Mack and Loma. The following means of coal transport were examined:

- Rail
- Trucks – off road and over the road
- Slurry pipeline
- Conveyor system

2.2.1 Rail

Moving the coal by rail is the most efficient means of transporting coal due to the extensive volume and capacity of rail cars. Approximately 8,000,000 tons will need to be moved from the Red Cliff Mine annually. Significant mining of the coal reserves in the area has not occurred because of the remote location and difficulties in getting the coal to market. A railroad spur would be able to carry the 8,000,000 tons per year (tpy). There would be an average of four trains per day, two full and two empty. Each rail car would carry approximately 100 to 110 tons of coal, and each train would consist of between 100 and 120 rail cars with three, four, or five locomotives.

2.2.2 Truck

Coal could be transported by trucks from the clean coal stockpile to a loading facility near Mack. If trucks similar to those used to haul coal over the road from McClane Mine to Cameo Power plant were used (25-ton), approximately 1,760 round trips per day (24-hour period) would be required to haul the 8,000,000 tpy of coal. This was determined to not be a practical or feasible alternative due to the number of trucks required, safety concerns, and impacts to State Highway (SH) 139.

Another trucking alternative would be to construct a dedicated haul road from the mine facilities to a loading facility at Mack using large off-road haul trucks. This would require the use of approximately five 240-ton trucks and an average of 93 trips per 24-hour period, if the loading facility was located on the UPRR mainline near Mack. Around-the-clock trucking operations would still be required. The alternative of using a private haul road and 240-ton trucks was considered in a more-detailed secondary screening, as shown in Table 2-1, Alternatives – Secondary Screening.

Table 2-1
ALTERNATIVES – SECONDARY SCREENING

Alternative	Issues/Impacts	Action
Trucking coal over a designated private haul road	• Noise – Trucks would be hauling 24 hours/day, 7 days/week. • *Eriogonum contortum* – Haul road may be designed to avoid some areas but would be substantially wider than railroad. • Visuals – Haul road would be substantially wider and require a bridge over SH 139. Loadout facilities would be within 1 mile of SH 139, Mack Lake, and Highline Lake; and be very visible to recreationists. • Costs – Estimated five 240-ton trucks at $3 million/truck would be required. Rail construction costs reduced by $4 million/mile. Trucks consume about 33 gallons of diesel fuel per hour and require substantial regular maintenance. Large truck-maintenance facility would be required. Long-term maintenance costs greater than Proposed Action. • Wetlands – No reduction in impacts, as railroad spur would still be required. • Air Quality – Haul road would not be paved and would require substantial watering to reduce dust. Haul trucks diesel engine emissions would add to train engine emissions. • Socioeconomics – No change to rail operations on private land and crossing CR M.8 and CR 10. Loadout operations would be approximately 5 miles closer to residences. Additional truck maintenance jobs would be created. • Wildlife – For safety concerns, haul road may be fenced, limiting wildlife movement. • Recreation –Truck and loadout noise would be audible at portions of the recreation facilities.	No Further Analysis
Conveyor system from mine to Mack or other location	• Noise – Conveyor would operate 24 hours/day, 7 days/week. The noise level, particularly near the loadout facility, could be substantial. • *Eriogonum contortum* – Conveyor footprint would be narrower than the railroad, but would still require construction of an access road along its entire length. Cuts and fills would be less than either rail or haul road. • Visuals – Conveyor would cross over SH 139. Loadout would be within 1 mile of Highline Lake and SH 139. Loadout and conveyor would be visible from Mack Mesa Lake and Highline Lake and would be visible to recreationists. • Costs – Conveyor would be cheaper to build and operate than haul trucks. Long-term maintenance would be greater than Proposed Action. Additional power requirements would require review/assessment of electrical supply capacity.	No Further Analysis

Table 2-1
ALTERNATIVES – SECONDARY SCREENING

Alternative	Issues/Impacts	Action
Conveyor system from mine to Mack or other location (continued)	• Wetlands – No reduction in impacts if loadout is located north of the Highline Canal. • Air Quality – Conveyor would be covered, but it would generate coal dust, especially at transfer stations. • Socioeconomics – Same as trucking alternative if loadout is located north of Highline Lake. • Wildlife – Conveyor would be on the ground as much as possible, creating a wildlife movement barrier. • Recreation –Loadout noise would be audible at portions of the recreation facilities.	No Further Analysis
Alternative rail route along Proposed Jeep Trail Rail Alignment	• Noise – No difference from Proposed Action. • *Eriogonum contortum* – Alignment would be sited in fewer areas of *Eriogonum contortum*. Impacts would be less. • Visuals – Alignment would require a bridge over SH 139, resulting in a long, easily visible bridge and embankments. Loadout may be located closer to SH 139. Materials pit(s) of 40 acres or more would create new scar on BLM-managed lands. • Costs – Costs would be higher due to bridge, embankment, and fill requirements. Alignment may be slightly longer than Proposed Action. • Wetlands – No change, as railroad spur connection with UPRR would be the same as the Proposed Action. • Air Quality – No difference from Proposed Action. • Socioeconomics – No difference from Proposed Action. • Wildlife – No difference from Proposed Action. • Recreation – No difference from Proposed Action.	No Further Analysis

Notes:
BLM = U.S. Bureau of Land Management
CR = County Road
SH = State Highway
UPRR = Union Pacific Railroad

2.2.3 Slurry Pipeline

Use of a slurry pipeline would require mixing water and coal to pump from the mine to a railroad loadout or to a specific end-user destination. This would require substantially more water than CAM–Colorado, LLC (CAM) has water rights for. Since CAM's plan is to sell coal on the open market, there is no specific end user. If the coal were to be loaded on rail cars, a dewatering and drying facility would need to be constructed at the loadout facility.

2.2.4 Conveyor System

A conveyor system could be constructed to deliver clean coal from the mine facilities to a loadout facility at Mack or north of the Highline Canal in the vicinity of Highline Lake State Park. The conveyor would be 72 inches wide, covered, and fenced. Right-of-way (ROW) for the conveyor would be 42 feet wide. The conveyor would be constructed mainly on the ground, with aerial construction over SH 139 and the county roads, and other natural and man-made features (e.g., Highline Canal). Due to elevational changes, it may be necessary to construct several drop (transfer) stations along the route. An access road would be required for the length of the conveyor system.

A secondary screening analysis (Table 2-1, Alternatives – Secondary Screening) was performed on this alternative.

2.2.5 No Transport of Coal – Use of the Coal at the Mine Site

Rather than transporting the coal to a market, an alternative was considered to use the coal at the mine site by constructing a power plant onsite. This alternative would not meet the purpose and need of the Proposed Action and would create a new project and set of potentially significant environmental impacts that are not being considered by any applicant at this time. Additionally, it would require a power plant capable of generating approximately 2,000 megawatts to burn 8,000,000 tpy of coal. By comparison, the Cameo Power plant generates 73 megawatts and the Craig power plant, the state's largest, generates 1,274 megawatts.

2.3 COAL TRANSPORTATION ROUTES AND DELIVERY LOCATIONS

2.3.1 Roads

If the coal were to be transported by truck, a dedicated haul road for off-road trucks could be developed that would cross over SH 139 and the county roads with shorter approaches than the railroad. The road would need to be wider than the railroad bed to accommodate two-way traffic by the large trucks and might require fencing to prevent use by unauthorized vehicles.

A secondary screening analysis (Table 2-1, Alternatives – Secondary Screening) was performed on this alternative.

2.3.2 Railroad Alignments

Several different conceptual rail routes from the mining area to the UPRR have been reviewed since 1979. All the routes considered (see Figure 2-1, Rail Alignment Revisions and County Road 10 Realignment) have ended at the UPRR at essentially the same location in Mack. This is primarily due to the residential, agricultural, and other private land constraints around Mack, Loma, Fruita, and farther east. In addition to these routes, a route that utilized the abandoned Uintah Railroad grade was briefly examined. From an economic standpoint, it is not feasible to extend the railroad west to connect with the grade and then build back to the east and south to connect with the UPRR. This would add approximately 5 to 10 miles, depending on how far east the line would be extended. Also, the proposed location at which the railroad spurs would join the UPRR is the northernmost point along the railroad alignment in this area. The railroad grade can be no more than 2 percent, so topographic restrictions must be considered to minimize the amount of required cuts and fills.

In the late 1800s, Mesa County proclamated ROWs along section lines for non-existing county roads within Mesa County. Mesa County's rights to build new roads will be protected. In the event that future roads are built along the proclamated routes, an appropriate railroad crossing will be constructed.

Rail Alignment Proposed Action Alternative

This alternative is the most practical from several standpoints. Topographically, it does not have more than a 2-percent grade and minimizes the necessity for cut and fill. This alternative has purposefully reduced impacts on wetlands by avoiding 3 acres of wetlands. Further description of this alignment and the revisions made to the originally proposed alignment are included in the Proponent Proposed Action (Section 2.11.1) and shown on Figure 2-2, Proposed Rail Alignments.

This alternative is the Proposed Action for the rail alignment and will be further analyzed in detail in this DEIS.

Other Rail Alignments

Other rail alignments, such as Proposed Jeep Trail Rail Alignment and Dorchester alignments are shown on Figure 2-2, Proposed Rail Alignments, and discussed in Table 2-2, Alternatives Considered Summary.

2.3.3 Railroad/Highway Crossings

The railroad alignment that is part of the Proposed Action would cross public roads at four locations: SH 139, CR 10, CR T, and CR M.8.

State Highway 139

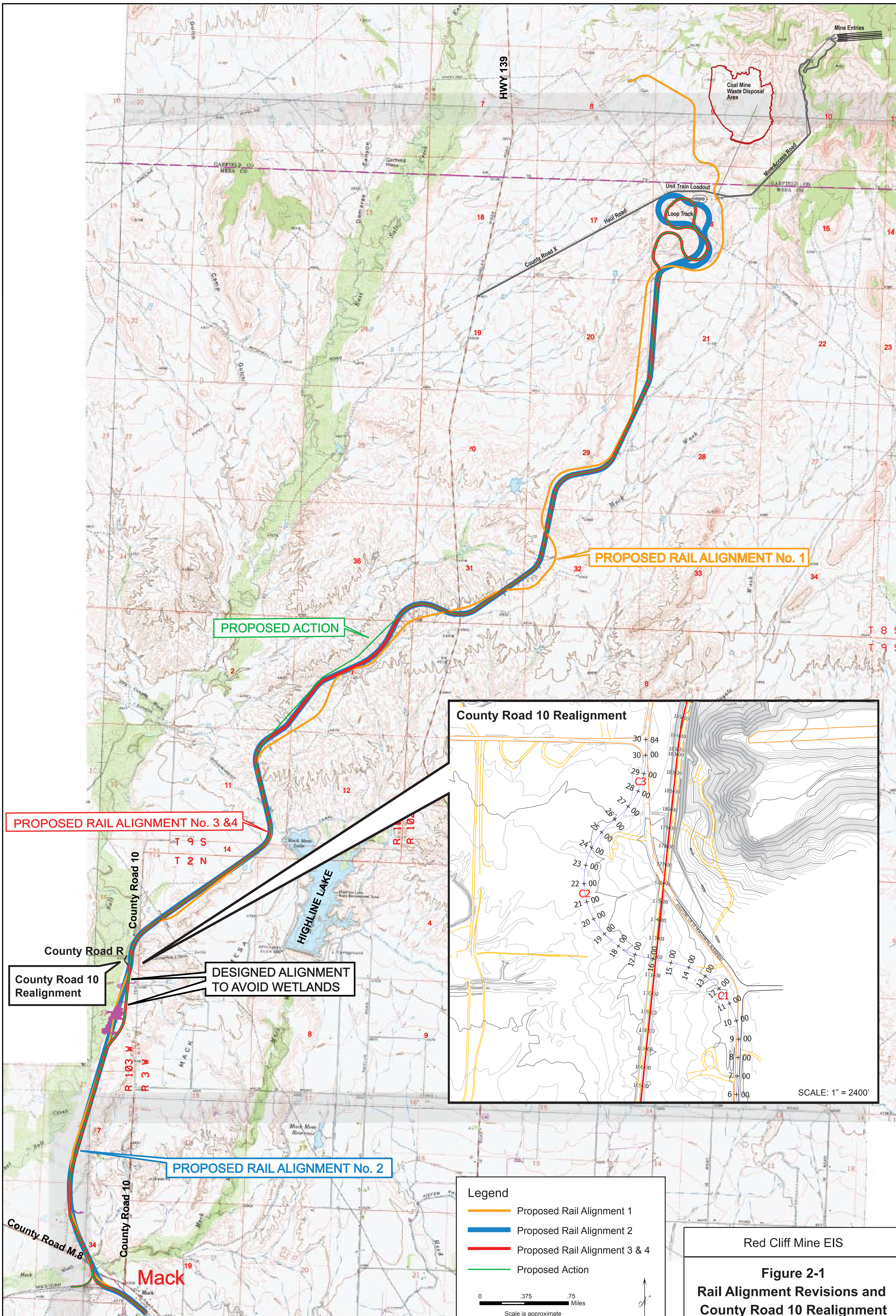
A grade-separated crossing at SH 139 is proposed. SH 139 would be reconstructed to go over the proposed railroad.

County Road 10

An at-grade crossing for CR 10 was originally proposed. The initial alignment raised concerns from the public and Mesa County because the railroad crossed the road at an unsafe angle. The at-grade crossing has been realigned (Figure 2-3, County Road 10 Realignment) to cross the railroad in a more perpendicular manner.

County Road T

The railroad crossing of CR T is proposed to be an at-grade crossing. CR T is a two-track dirt road maintained by Mesa County. The at-grade crossing would be built to comply with Mesa County requirements.



Red Cliff Mine EIS

Figure 2-1
Rail Alignment Revisions and County Road 10 Realignment

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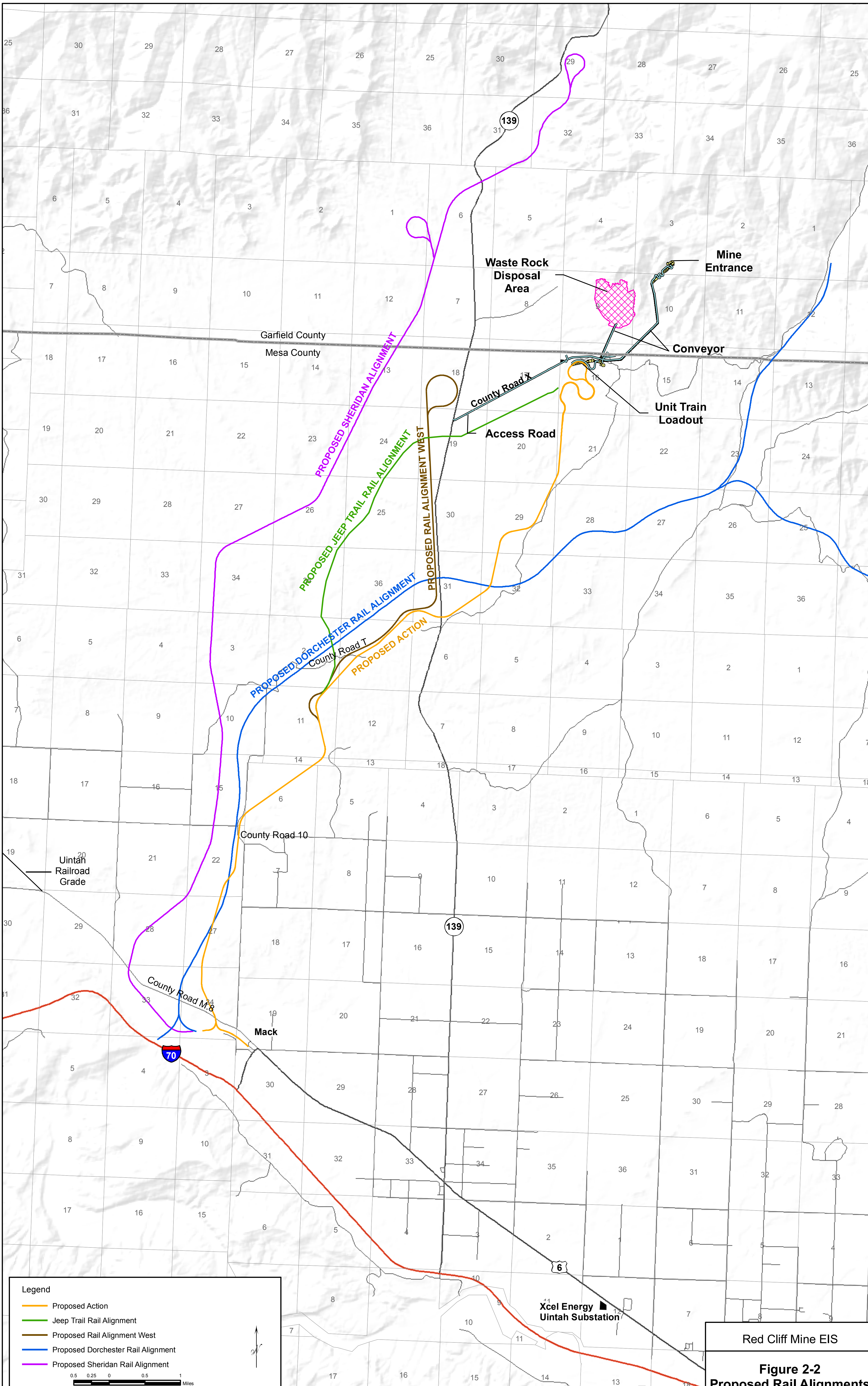

Red Cliff Mine EIS

Figure 2-2
Proposed Rail Alignments

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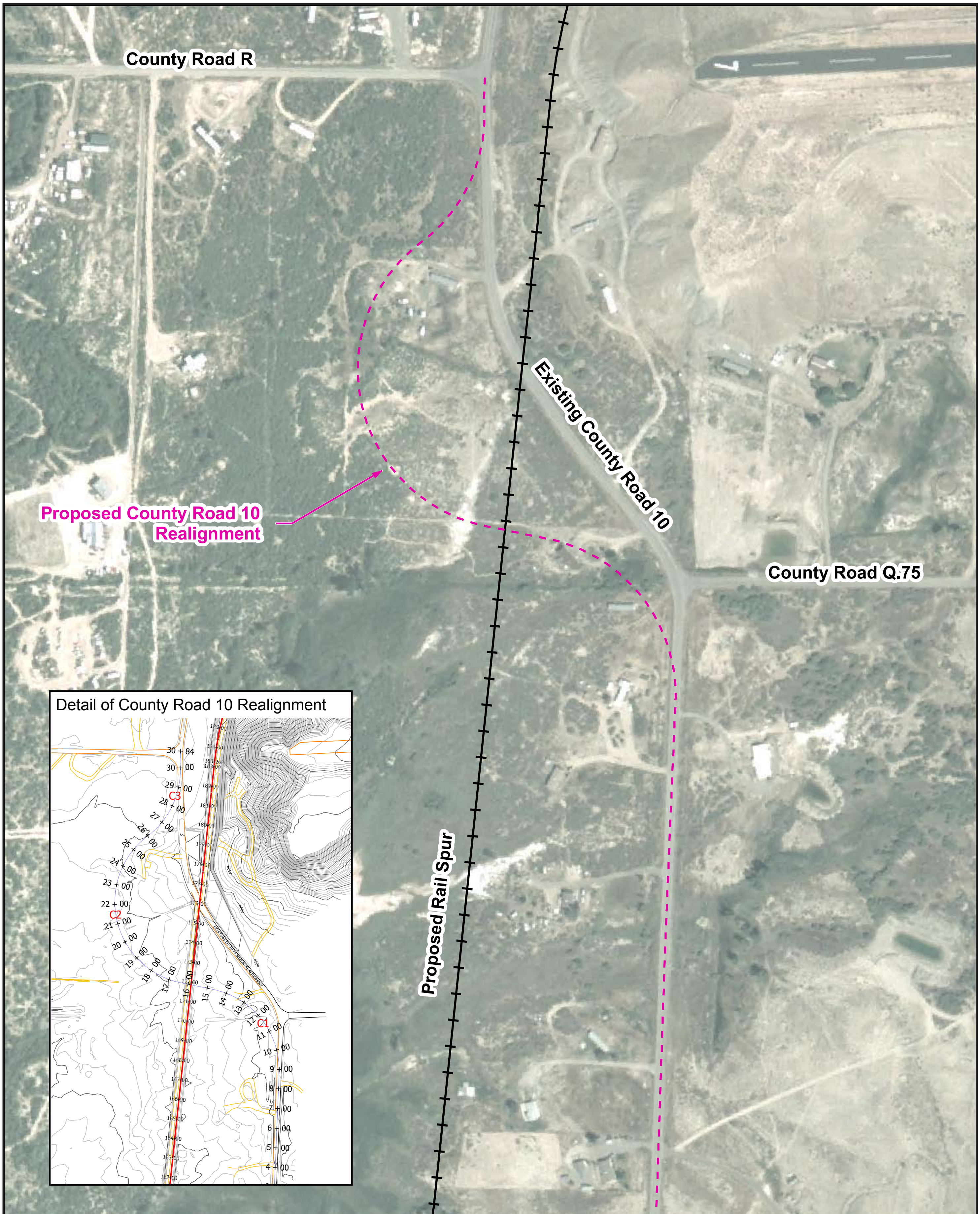

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Red Cliff Mine EIS

Figure 2-3
County Road 10 Realignment

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Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
Project Component	**Coal Transport**		
Transport the coal by railroad.	See subsequent text.	The movement of approximately 8,000,000 tpy of coal can best be done in large volume train cars.	Proposed Action Analyze in detail
	Truck coal over existing roads including SH 139.	Trucking coal over SH 139 is not a practical alternative due to increased truck traffic (over 1,760 round trips per day), safety concerns, and impacts to the highway. Trucking the coal would also require the construction of coal storage and a load-out facility at Mack, including a sidetrack approximately 2 miles long, with a loadout facility centered along the length of the track.	NAID
	Truck coal over a designated private haul road.	A private haul road would not decrease the distance coal must be hauled. The length of the proposed rail may be shortened, but every mile of the proposed rail line would be replaced by the haul road. The need for a loadout facility remains. The loop track, rail loading facility, and associated coal stockpiles would be constructed closer to homes, ranches, and cultivated lands. Approximately 100 acres of land would be required for the loadout/loop track facilities. The likely location for these facilities would be less than 1 mile north of Mack Mesa Lake and Highline Lake. A crossing over SH 139 would be required. There are fewer restrictions on possible alignments of a private haul road, and trucks could cross the highway with a shorter approach. The haul road would need to be substantially wider than the rail line to allow haul trucks to pass safely, and would likely need to be fenced. Trucks would operate on a 24-hour, 7-day/week basis.	Not carried forward from secondary screening

Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
	Slurry pipeline to railroad load-out or specific end user designation.	Slurry pipeline would require substantially more water than CAM has rights for. Also, there is currently no specific end user. A slurry pipeline would require the construction of a dewatering and drying facility at the loadout and would require a water treatment plant to treat the slurry water before discharge or reuse.	NAID
	Conveyor system from mine portal to Mack or other location.	A conveyor system would have a narrower footprint than either a rail or haul road alternative. Straight line routes are preferred. Loadout facilities as previously described would be required north of the Highline Canal.	Not carried forward from secondary screening
	No transport of coal – Construction of a power plant at the mine site.	Constructing a power plant at the mine site does not meet the purpose and need of the Proposed Action. A power plant would not be able to use 8,000,000 tpy of coal.	NAID
Project Component	**Coal Transportation Routes and Delivery Locations**		
Proposed Action	See subsequent text.	Railroad alignment is restricted by residential, agricultural, and other private land restrictions; also UPRR requires no more than a 2-percent grade, so topographic restrictions must be considered to minimize the necessity of required cuts and fills. The Proposed Action reduced the impact on wetlands by 3 acres.	Proposed Action Analyze in detail
	East Salt Creek/Mack Wash (Sheridan) RR alignment	East Salt Creek/Mack Wash alignment would pass through a new housing development (Canyon Estates South). It crosses Mack Wash and East Salt Creek and connects to the UPRR in essentially the same location as the Proposed Action.	NAID

Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
	Dorchester RR alignment	Dorchester route crosses through irrigated lands and wetlands, with greater impacts. Connects to UPRR at essentially the same location as the Proposed Action.	NAID
	Proposed Jeep Trail RR alignment, connecting with the Proposed Action alignment at the Highline Canal crossing.	Route would have less impact to *Eriogonum contortum* than the Proposed Action but probably impact more riparian habitat. It would require an additional 2,000,000 cubic yards of fill and would connect with UPRR at the same location as the Proposed Action. Due to grade considerations, the railroad would need to be constructed over SH 139 south of the CR X location, resulting in more visual impact.	Not carried forward from secondary screening
	Utilize an existing coal loading facility at Loma.	There is no useable coal loading facility at Loma. The Loma location is not suitable for the capacity of plans to mine coal from Red Cliff Mine. Complete new loadout facilities would need to be constructed at the Loma location, including a 2-mile-long sidetrack (siding), 100-foot-tall coal storage silos, and conveyors from the truck or conveyor dump to the top of the silos and from the bottom of the silos to the train loadout.	NAID
	Alternatives for crossing CR 10 and CR M.8 • Grade-separated crossing	• Mesa County has stated that a grade-separated crossing at CR M.8 may be practicable. It would entail replacing the bridge over Mack Wash, as the road must cross over the railroad due to grade considerations connecting with the UPRR mainline.	Analyze in detail
	• Noiseless grade crossings	• Reasonable and practicable	Analyze in detail

Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
Project Component	**Electric Transmission to Mine**		
GVP proposes installing transmission lines along CR 14 to supply electricity to the mine from the Xcel Energy Uintah Substation at Fruita. North of the Highline Canal, the route would be entirely on BLM-managed lands. CAM will construct a substation at the mine to reduce voltage to useable levels.	See subsequent text.	No private lands north of the Highline Canal would be impacted. New/additional access would be required for much of the line on BLM-managed lands. The line would be constructed in county road easements south of the Highline Canal.	Proposed Action Analyze in detail
	Construct transmission line along SH 139 and CR X.	Installing a transmission line along SH 139 would impact the view along the highway—a designated scenic byway—unless it is installed underground. Both Mesa County and CDOT have expressed opposition to this alternative. This was GVP's first preferred alternative due to access issues and ROW easements.	NAID
	Alternative A – Construct a transmission line that follows CR 16 and crosses BLM and private lands north of the Highline Canal then follows a pipeline and transmission line corridor northwesterly to the mine facilities.	Must cross private land (estimated 19 parcels) north of Highline Canal to get to the transmission line/pipeline corridor. There are no easements on private land north of the Highline Canal. Good access along CR 16, but requires more angle (turning) structures. Is the longest alternative.	Analyze in detail
	Alternative B – Same route as Alternative A south of the Highline Canal. North of the canal – follows section lines and land ownership boundaries.	Alternative B would reduce (but not eliminate) private land crossings by using BLM isolated parcels. Sections of the transmission line would follow existing disturbance and access roads.	Analyze in detail

Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
	Alternative C – Construct a transmission line that follows the Proposed Action alignment along CR 14 to just north of the Highline Canal. At that point, it would diverge from the Proposed Action, trend to the northwest then north, and join the proposed RR alignment 1,500 feet east of SH 139. It would follow the RR and water pipeline alignment to the mine site.	This alternative would be entirely on BLM-managed lands north of the Highline Canal. It would consolidate transmission line, water pipeline, and RR disturbance in a single corridor for approximately 18,000 feet. GVP indicates that they prefer this alternative to the current Proposed Action. It will come within 1,500 feet of SH 139 and portions will be visible from the highway. Some new access will be required.	Analyze in detail
	Supply power to mine from substation other than the Uintah Substation.	GVP has completed a system analysis showing that energy requirements for the mine are not available from any substation other than the Uintah Substation.	NAID
	Construct all or a portion of the transmission line underground.	Burying the transmission lines will substantially increase construction costs. Industry studies show that the cost for underground construction is 8 to 10 times greater per mile than above ground construction. GVP estimates construction costs of approximately $1.5 million/mile vs. $170,000/mile for overhead lines. Burying the transmission line will have a greater environmental impact to some resources due to ground disturbance. Access for repair and maintenance is more difficult, and outages could be substantially longer.	NAID
Project Component	**Routes for Delivering Water to Mine Facilities**		
Water would be diverted from Mack Wash and pumped to the mine via pipeline. The pipeline would be constructed along the RR alignment.	No feasible alternatives to diverting water from Mack Wash have been identified. Due to water allocations, no other diversion points are available.	Placing the pipeline along the proposed RR alignment would virtually eliminate the need for additional disturbance for the water pipeline.	Proposed Action Analyze in detail

Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
Project Component	**Means of Disposing of Waste Rock**		
Waste rock pile would be located in close proximity to the coal preparation plant. It would encompass 190 acres. The majority of the pile would be located in an area with poor soil quality away from the sage covered benches and wildlife habitat.	Based on recommendations from Colorado Division of Wildlife, the waste rock pile configuration has been modified.		Proposed Action Analyze in detail
	Locating waste rock pile in an area with poor soil quality completely removed from the sage covered benches.	No reasonable and practical locations have been identified that would not create additional visual impacts or impacts to BLM sensitive species and wildlife.	NAID
	Transporting waste material by rail line to another disposal site.	Transporting waste material via rail is not a viable option because the railroad spur would be authorized to transport coal only. Additionally, the loading and unloading of waste rock and the freight cost to an undefined location would not be economically feasible.	NAID
	Locating waste rock pile lower in the drainage of ephemeral waters.	Locating the waste rock pile lower in the drainage is not a reasonable alternative because it would have a greater impact on drainage, would require more land area, and would disturb more wildlife habitat.	NAID
	Locate the waste rock pile at a dry site in Section 30, T8S, R102W.	Locating the waste rock pile in Section 30 would affect *eriogonum contortum*, and additional wildlife habitat. It would also create additional visual impacts.	NAID

Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
Project Component	**Coal Leasing**		
Approximately 23,000 acres with the life of the mine estimated at 30 years.	BLM has considered two additional leasing alternatives described in the subsequent text.	The Proposed Action maximizes the recoverable coal from the Red Cliff Mine portals.	Proposed Action Analyze in detail
	Lease Alternative 1 – This alternative is approximately 21,000 acres. The overburden depth cutoff is only 1,500 feet. The deeper coal (between 1,500 feet and 2,000 feet) would potentially be by-passed.	This alternative would result in potentially recoverable coal resources between 1,500 feet and 2,000 feet deep not being mined.	NAID
	Lease Alternative 2 – This alternative is approximately 32,000 acres, with expansion to the east. The overburden depth cutoff is 2,000 feet deep.	The potential recoverable reserves for this area would significantly exceed the tonnage planned for the Red Cliff Mine. Additionally, the more distant reserves would likely be produced from different portals due to the distance of the reserves from the planned portals.	NAID
Project Component	**Location of Mine Portal**		
Construct mine portals in Section 3, T8S, R102W.		This location was selected based on location and quality of coal outcrop, access issues, and the need to be within CAM's existing coal leases.	Proposed Action Analyze in detail
	Construct mine portal at a location further to the east.	Constructing the mine portal at another location would have a greater impact on recreation and residences and would require a longer haul to the UPRR. The portal would not be located in leases currently held by CAM. It would not improve upon the Proposed Action.	NAID

Table 2-2
ALTERNATIVES CONSIDERED SUMMARY

Proposed Action	Alternatives Considered	Reasonableness and Practicability of Alternatives	Action
Project Component	**Methane Venting**		
Methane gas must be removed from the mine to insure worker safety.	BLM has considered two additional alternatives to venting methane described in the subsequent text.	The Proposed Action is to vent methane using a ventilation fan and 2 to 3 methane wells per longwall panel. Methods of reducing methane emissions will be examined and implemented using an adaptive management strategy if found technically, economically, and legally feasible.	Proposed Action Analyze in detail
	Alternative 1 – Oxidation of Methane Gas – this alternative describes the use of flaring and oxidizing technology to mitigate venting of methane to the atmosphere.	Flaring of methane gas may cause mine explosions due to fluctuations in the levels of methane. This is an undesired condition and is not currently approved by the Mine Safety and Health Administration. Oxidizing technology is currently being tested at the commercial scale and has not yet been developed for commercial use, and is therefore not currently feasible.	NAID
	Alternative 2 – Capture/Use of Methane and Leasing of Coal Mine Methane – this alternative describes capture of methane gas and distribution of gas to market.	Distribution of methane to market would require processing, compression, and transportation of the gas. Economic concerns related to additional facilities would be prohibitive for selecting this alternative. There is also an unresolved legal issue of gas ownership from coal being mined.	NAID

Notes:

BLM	=	U.S. Bureau of Land Management	RR	=	Railroad
CAM	=	CAM–Colorado, LLC	S	=	south
CDOT	=	Colorado Department of Transportation	SH #	=	State Highway #
CR #	=	County Road #	T#,R#	=	Township #, Range #
GVP	=	Grand Valley Power	tpy	=	tons per year
NAID	=	not analyzed in detail	UPRR	=	Union Pacific Railroad
ROW	=	right-of-way	W	=	west

County Road M.8

The railroad crossing of CR M.8 is proposed to be an at-grade crossing. In response to concerns raised by the public and Mesa County, an alternative crossing of the rail alignment at CR M.8 will be examined. This alternative includes a grade-separated crossing (bridge) of the railroad and Mack Wash by CR M.8, and is addressed as an alternative within each resource section of Chapters 3 and 4. This alternative is shown on Figure 2-4, County Road M.8 Realignment.

Noiseless Grade Crossing Option

Another alternative for the at-grade crossings of CR 10 and CR M.8 has been developed that would entail the construction and approval of noiseless crossings. This requires special construction and operation that allows the trains to cross the roads without sounding their horns.

2.3.4 Loadout Facility Location

The Proposed Action, which includes a railroad from the Red Cliff Mine area to Mack, proposes that the loadout area will be at the mine site. This would mean that the coal stockpile, stacking tubes, and other associated facilities would be located at some distance from the view of the general public, and not near busy travel routes (U.S. Highway 6 [US 6] and Interstate 70 [I-70]) or residences and businesses.

Alternative Loadout Locations

Any system other than transporting the coal by rail would require a coal stockpile and stacking tubes (or coal storage silos), and loadout facilities located closer to the UPRR, where it would be more visible to the general public. This facility could either be constructed immediately adjacent to the UPRR, or north of the Highline Canal on BLM-managed land. If located at the UPRR, a unit train loadout and rail siding would need to be constructed adjacent to the existing track. This would consist of a 2-mile-long railroad spur, coal storage silos, and loadout structures including a conveyor system (Figure 2-5, Proposed Loadout Facility). Clean coal would be delivered to this point by truck or conveyor and loaded into the unit train as it moves along the siding. This facility would need to be located between Mack and Fruita.

A loadout facility north of the Highline Canal and west of SH 139 would still require a railroad spur connection to the UPRR through private lands and crossing county roads. It could be configured similarly to the Proposed Action, with a loop track and related facilities.

Coal would be transported to either facility on a 24 hours per day, 7 days per week schedule. Either loadout option would essentially split the cleaning, handling, and loading into two locations. Additional equipment and facilities would need to be purchased and maintained. Additional water and transmission lines would need to be constructed and new access provided north of the Highline Canal. For operational considerations (cost and efficiency), it would be best to have operations consolidated in a single location.

One other coal loading location was considered. At one time there was a minimal coal loading facility at Loma consisting of little more than a place to stockpile coal. Using a front-end loader, the coal was loaded onto rail cars. There are no longer any facilities at Loma; this location would not be suitable for the type of the loadout facilities necessary to move 8,000,000 tons of coal per year.

2.4 MEANS AND ROUTES FOR DELIVERING THE REQUIRED ELECTRICAL POWER TO THE MINE FACILITIES

2.4.1 Overhead Transmission Line

Grand Valley Power (GVP) reviewed alternatives for power supply and determined that the only reasonable delivery point for the power requirements of the Red Cliff Mine is the Xcel Energy Uintah Substation at Fruita. For ease of construction and quicker response during transmission outages, GVP prefers to construct the transmission lines adjacent to existing roads whenever possible. GVP initially reviewed several routes to connect the substation with the proposed facilities. GVP's preference was to build the line on a route adjacent to SH 139. During agency scoping and review, it was determined that this route would have unacceptable visual impacts, and GVP filed an application with the BLM to construct the Proposed Action as shown on Figure 1-1, Proposed Action. In response to other agency concerns, three additional transmission line alternative routes were developed and are described in Table 2-2, Alternatives Considered Summary.

Four transmission line alternatives are under consideration, and, they are described and analyzed in detail in this DEIS. The alternative that GVP proposed to construct along SH 139 is not being considered for further analysis.

2.4.2 Underground Transmission Line

Another alternative would be to build all or a portion of the transmission line underground. This would result in substantially higher construction and maintenance costs. GVP estimates that underground construction costs are eight to ten times higher per mile of construction than overhead construction.

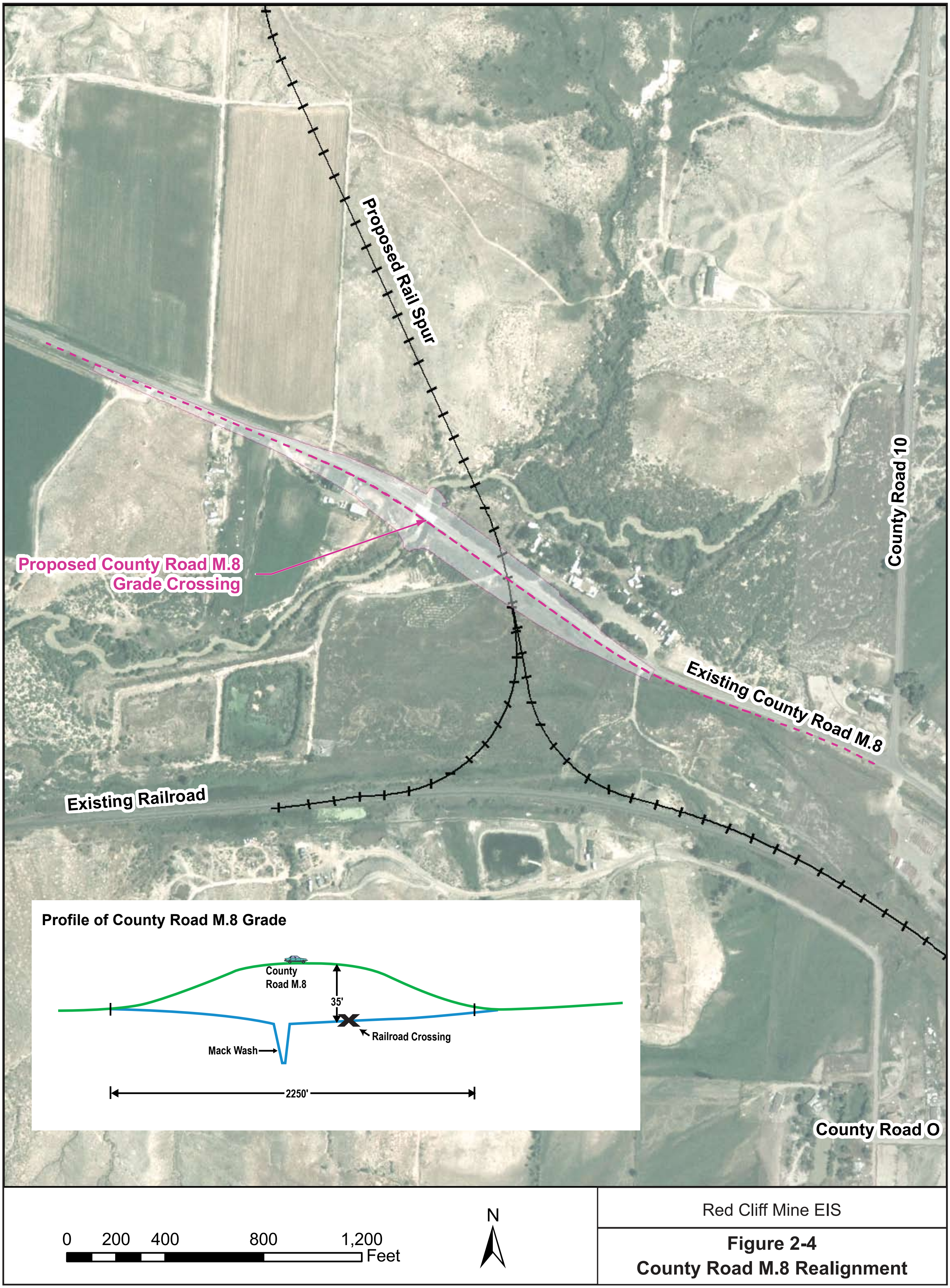
2.5 WATER DELIVERY ROUTES

CAM owns water rights on Mack Wash, the point of diversion must be on the wash below (downstream of) more senior water rights. Under the Proposed Action, the pipeline would be constructed in the railroad spur ROW (Section 2.11.1). If another route—rail, road, or conveyor—was selected, the pipeline could be constructed in that ROW instead.

Due to the nature and location of CAM's water rights, there are no feasible alternatives to diverting the water from Mack Wash.

2.6 WASTE ROCK DISPOSAL

A waste rock pile encompassing approximately 190 acres was originally proposed. During agency scoping, CDOW expressed concern regarding impact to the sage-covered terraces at the south end of the disposal area. To lessen the impact to this important wildlife habitat, this feature was redesigned to impact 68 acres of this habitat. Figure 2-6, Waste Rock Pile, shows both the original area and the redesigned waste rock pile.



Red Cliff Mine EIS

Figure 2-4
County Road M.8 Realignment

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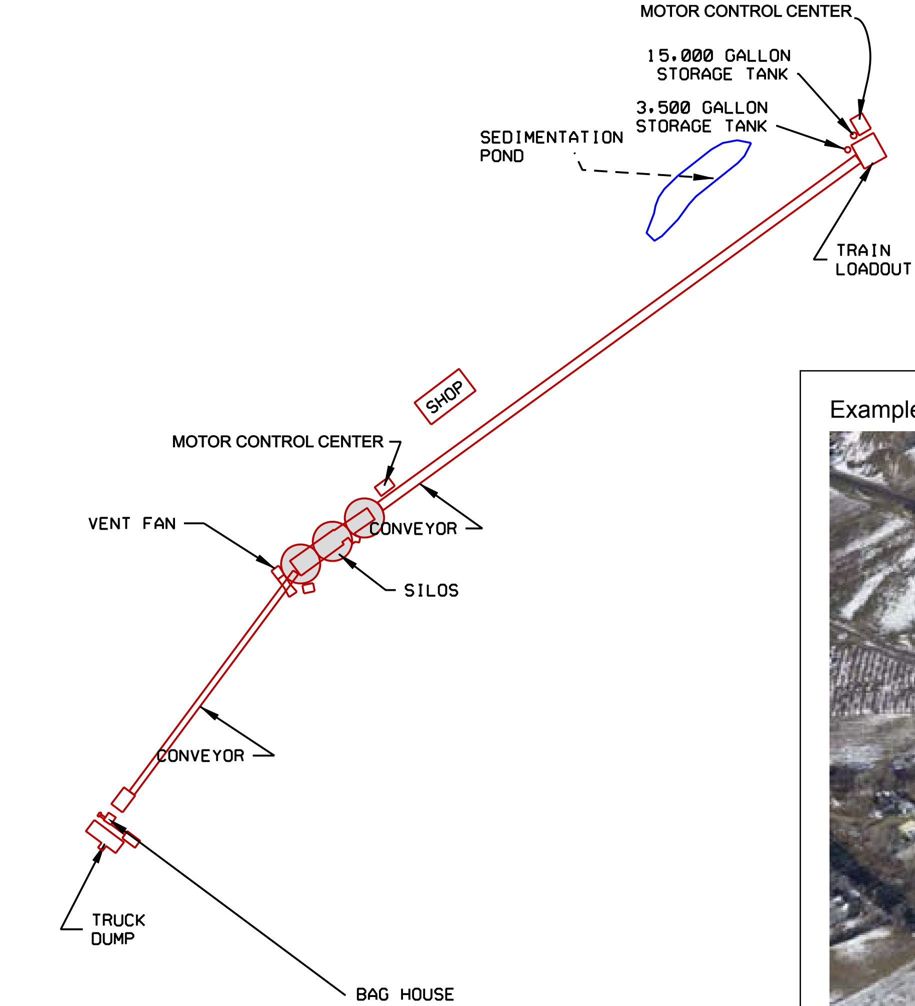

Example of a Loadout Facility

NOTES:

1. AT GRADE TRUCK DUMP OR CONVEYOR DUMP.
2. CONVEYOR TO THE TOP OF THE SILOS. THE 10,000, TON SILOS ARE IN EXCESS OF 100 FEET HIGH.
3. CONVEYOR FROM THE BOTTOM OF THE SILOS TO THE BATCH WEIGH TRAIN LOADOUT.
4. THE BATCH WEIGH LOADOUT IS AT THE CENTER OF A 15,000 FOOT LONG SIDING.

Red Cliff Mine EIS

Figure 2-5
Proposed Loadout Facility

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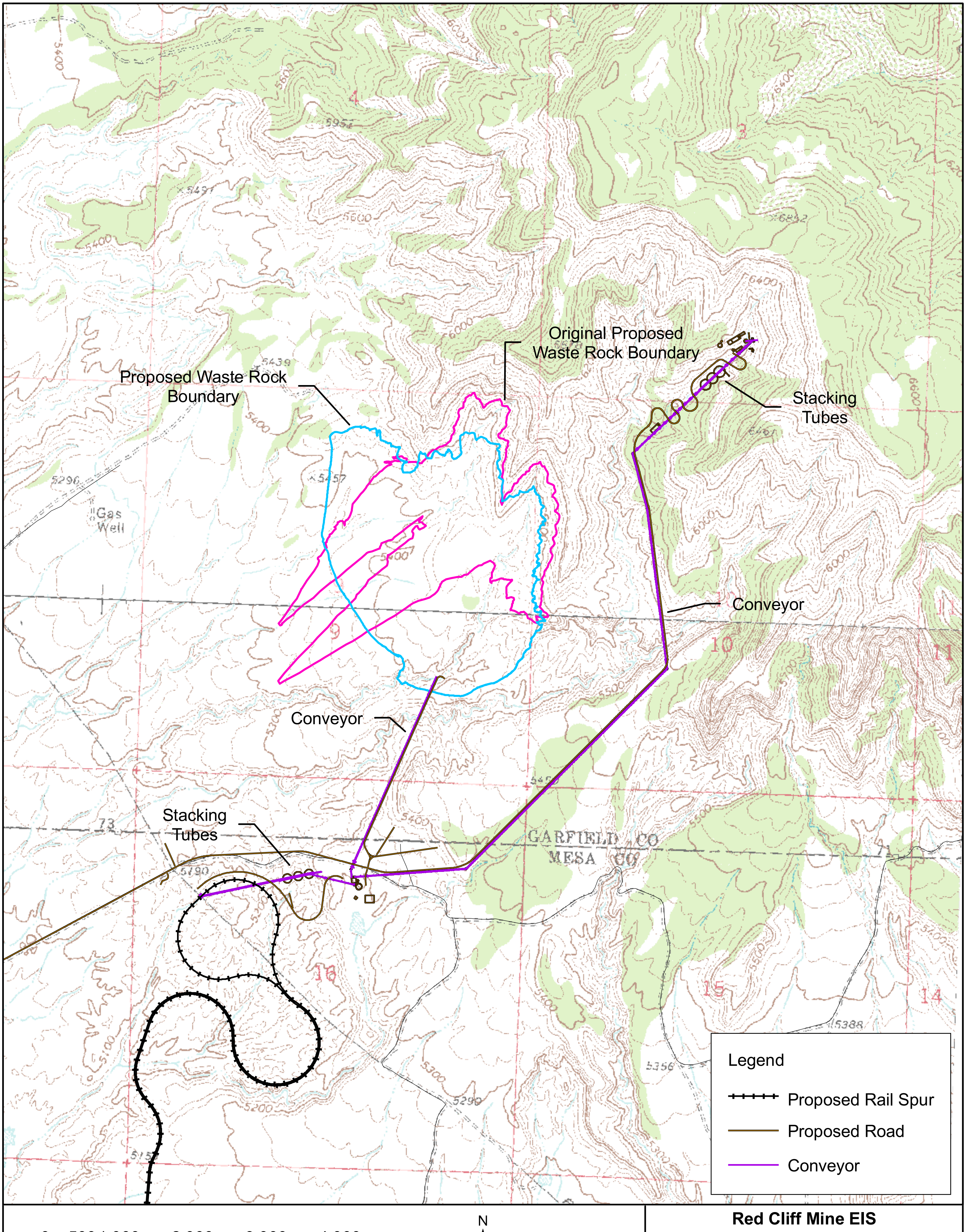


Red Cliff Mine EIS

Figure 2-6
Waste Rock Pile

2.7 FUTURE COAL LEASING AREA

Three areas outside the currently leased coal were considered for potential coal leasing (Figure 2-7, Overburden and Lease Alternatives). All three areas would include CAM's Lease Application. In selecting a lease area, BLM considers the feasibility of mining the coal using modern mining techniques and maximizing the recovery of government resources. Currently, it is feasible to mine this coal using only underground mining methods. Surface mining is not an option due to the ratio of the amount of recoverable coal to the depth of the overburden. Using modern underground mining techniques, it is generally not feasible to recover coal with overburdens in excess of 2,000 feet.

Lease Area BLM Proposed Action is approximately 23,000 acres in size. The overburden cutoff depth is 2,000 feet, and the coal could feasibly be mined from the proposed Red Cliff Mine entrance (portals).

This Proposed Action will be further discussed and analyzed in the DEIS.

Lease Area Alternative 1 is approximately 21,000 acres in size. It generally includes leasable federal coal to the 1,500-foot depth (Figure 2-7, Overburden and Lease Alternatives). Potentially leasable coal between 1,500 and 2,000 feet would not be available under this alternative.

Lease Area Alternative 2 is approximately 32,000 acres in size. The overburden cutoff depth is 2,000 feet and it extends further to the east and south from the proposed Red Cliff Mine portals. Due to the distance from the proposed portal location, accessing this coal would probably require new portals and attending infrastructure.

2.8 LOCATION OF THE MINE PORTAL

The Proposed Action is to construct mine portals in Section 3, Township 8 South, Range 102 West (T8S, R102W). This location was selected based on location and quality of coal outcrop, access issues, and the need to be within CAM's existing coal leases.

2.8.1 Alternative Mine Portal Location

An alternative considered was to construct the mine portal at a location further to the east and south. Constructing the mine portal at another location would have a greater impact on recreation and residences and would require a longer haul to the UPRR. The portal would not be located in leases currently held by CAM.

2.9 METHANE VENTING

Ventilation air systems are used in underground mines to maintain low concentration levels of methane during mining operations, as methane is combustible at concentrations between 5 percent and 15 percent. As a safety precaution, ventilation air systems are required in mines that have any detectable levels of methane. Ventilation air systems maintain a methane concentration below 1 percent by using large fans to inject fresh air from the surface into the mine, thereby lowering the methane concentration within the mine. This ventilation air is extracted from the mine and vented to the atmosphere through degasification systems (EPA 2006).

Coal mine methane degasification systems are used to supplement mine ventilation air systems to ensure that methane in underground mines remains within safe concentration levels. While degasification systems are primarily used for safety reasons, they can also be used to recover methane to be utilized as an energy resource. Degasification systems include vertical wells (drilled from the surface into the coal seam months or years in advance of mining), gob wells (drilled from the surface into the coal seam just prior to mining), and in-mine boreholes (drilled from inside the mine into the coal seam or the surrounding strata prior to mining) (EPA 2008).

Methane venting alternatives are described in the following text.

Proposed Action: Methane Venting

A mine ventilation fan and steel duct work would be located at the return entry on the portal level. The ventilation fan is approximately 8-feet in diameter. As part of the methane degasification systems, it will likely be necessary to install two or three methane wells in each longwall panel. The eight to ten inch diameter methane wells are spaced along the length of the longwall panel. One methane well will be installed near each end of the longwall panel and one will be installed near the center of the longwall panel. Longer panels may require additional methane wells and/or larger diameter methane wells. As the longwall panel advances, the methane wells begin to function. After the longwall panel is complete and sealed the methane wells are turned off and sealed.

The location of the coal mine methane degasification systems (wells) and the timing of drilling are unknown at this time. Methane well placement would be based on need as established by the conditions in the mine as well as surface conditions and will be designed site-specifically as the project progresses.

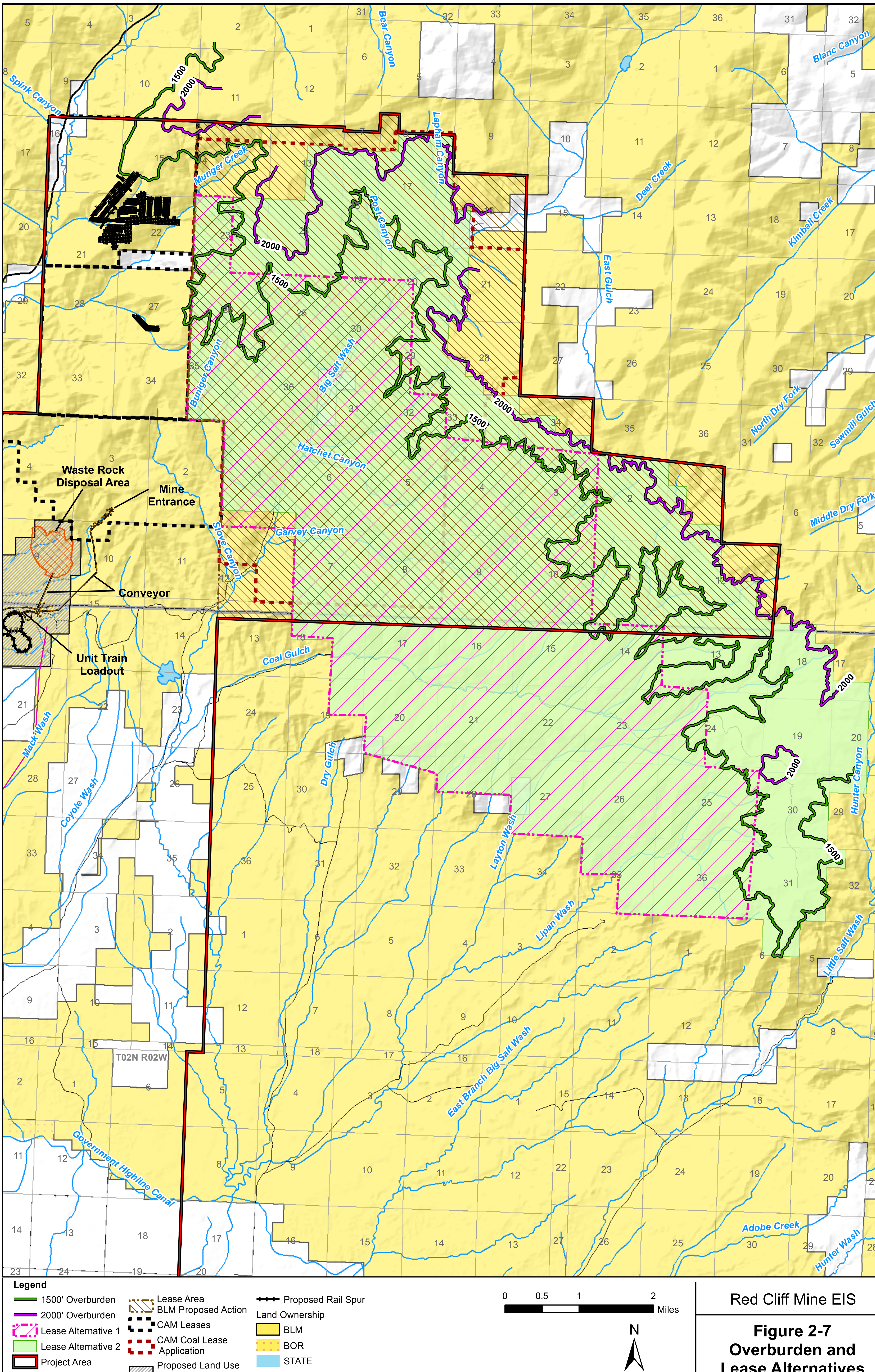
The Proposed Action is to vent methane using a ventilation fan and 2 to 3 methane wells per longwall panel. Methods of reducing methane emissions will be examined and implemented using an adaptive management strategy to determine their technical, economical, and legal feasibility.

Once the location of wells is determined, development of roads would be necessary to transport drilling equipment to the site. Roads would be designed with appropriate design standards and mitigation measures added on a site-specific basis.

Methane well construction time is estimated at less than 12 months and would be constructed prior to underground mine operations reaching the shaft location. Drill holes would be plugged and pads would be reclaimed. Access roads would be decommissioned and reclaimed.

The methane liberated from the Red Cliff Mine would increase from 3,817 to 22,900 tons per year (tpy) (0.5 to 3.0 or more million cubic feet per day [MMcfd]) over the first few years of mining. Extrapolation of the data indicates that between 65,646 and 104,575 tpy (8.6 and 13.7 MMcfd) could be ventilated from the mine when full production is achieved.

In 2007, there were 1358 coal mines in the U.S., of which 563 were underground mines (Energy Information Administration 2007). EPA's *Identifying Opportunities for Methane Recovery at US Coal Mines* (EPA 2008) evaluated 50 coal mines, 23 of which were using methane degasification systems. Of the 23 mines using methane degasification systems, only 14 had installed methane recovery and use systems (EPA 2008). Some of these degasification system studies are under



Red Cliff Mine EIS

Figure 2-7
Overburden and Lease Alternatives

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the auspices of the U.S. Environmental Protection Agency, state environmental departments, and Mine Safety and Health Administration, whereas others are private investigations. The percentage of U.S. mines evaluated by the EPA with installed methane recovery and use systems is very small (2.5 percent) compared to the total number of underground mines, and is only 1 percent of the total number of coal mines in the U.S. This may therefore be considered an emerging practice in the U.S.

Pilot projects have been initiated to evaluate technologies to capture and use ventilation air methane (VAM) liberated during coal mining. Some pilot projects are being conducted overseas and may not acceptable in the U.S. because of safety concerns. As of November 2008, the pilot projects' implementation and evaluation have not been completed thus neither the technical nor economic feasibility is known. And, with any pilot project, even if proved feasible, its application to another mine site requires evaluation of site specific factors.

Additionally, there is legal uncertainty regarding the ownership and control of gas rights on federal lands being mined, and whether any technologies can satisfy MSHA requirements.

On their existing leases, CAM has agreed to pursue an adaptive management strategy with BLM. BLM would propose a similar strategy with any future lessee. 43 CFR 46 contains the U.S. Department of Interior's regulations for implementing the National Environmental Policy Act. These regulations were amended effective November 14, 2008 to allow for the incorporation of adaptive management strategies into alternatives, including the Proposed Action.

An adaptive management process will be utilized to evaluate the feasibility of mitigating methane from the ventilation air fans and any methane degasification systems for the Red Cliff Mine. Upon approval of the mine plan, the mine operator will have one (1) year to identify existing methane recovery projects and pilot VAM projects that may be applicable to this project. At the end of the one (1) year time period, the mine operator will submit a report to BLM outlining the technical and economic feasibility of mitigating and/or capturing and using the methane gas being vented at these projects. Annually thereafter, the mine operator shall provide BLM with summaries on the status of these projects and any mitigation and/or capture methods implemented, including the effectiveness of methane capture, the percent of methane captured, any operational difficulties, and findings regarding suitability of the projects' costs and adaptability. The annual reports must also outline any legal obstacles precluding implementation of any methane mitigation and/or capture. If methane mitigation and/or capture is deemed technically, economically, and legally feasible, the mine operator and BLM will develop a schedule for implementation.

The methane venting alternatives described below are not mutually exclusive. This adaptive management process has the purpose of determining if one, or both may be technically, economically, and legally feasible for use at the proposed Red Cliff Mine.

Alternative 1: Oxidation of Methane Gas

Flaring

Flaring of methane gas is a possible measure to mitigate venting of methane to the atmosphere. However, flaring of methane gas may cause mine explosions due to fluctuations in the levels of methane. This is an undesired condition and is not currently approved by MSHA.

Oxidation Technologies

If oxidizing technology were applied to all mine ventilation air with concentrations greater than 0.15 percent methane, approximately 97 percent of the methane from the ventilation air could be mitigated (EPA 2006). During the past decade, catalytic and thermal flow reversal reaction technologies have been developed to mitigate methane emissions from degasification systems. These technologies may use up to 100 percent of the methane from wells, and the byproduct heat may be used for the production of power or to satisfy local heating needs (U.S. Climate Change Technology Program 2005). This technology is currently being tested at the commercial scale and has not yet been developed for commercial use, and is therefore not currently feasible. However, as technology develops, this may be a viable option in the future.

Alternative 2: Capture/Use of Methane and Leasing of Coal Mine Methane

Capturing methane released during mining operations and putting it to beneficial use is another alternative to consider. However, there are several complicating factors that make this alternative not feasible at this time. As shown on Figure 3-9, Authorized Oil and Gas Leases within the Existing Coal Lease Application, about one half of the existing coal lease and proposed future coal lease area is currently leased for oil and gas under the provisions of the Mineral Leasing Act (MLA). Distribution of methane to market would require processing, compression, and transportation of the gas. Economic concerns related to additional facilities may make this alternative uneconomic. A discussion of each situation is given in subsequent text.

Mineral Leasing

Coal and oil and gas resources fall under differing regulations (43 CFR 3400 for coal, and 43 CFR 3100 for oil and gas) which implement provisions of the MLA, and have specific management needs. For example, the federal coal lease grants the lessee the exclusive right and privilege to drill for, mine, extract, remove, or otherwise process and dispose of the coal deposits in the lease; the coal lease does not grant the right to the coal lessee to capture gas released incident to mining. Further, the coal lease reserves the right of the Lessor (BLM) to lease other mineral deposits contained on the leased coal lands including other leaseable minerals (BLM Form 3400-12, Section 7), which includes oil and gas. A recent Interior Board of Land Appeals (IBLA) decision has ruled that the methane mixture released by coal mining into the environment, as approved by MSHA for the protection of coal miners, is not the oil and gas deposit addressed by leasing under the MLA (Vessels Coal Gas, Inc., 175 IBLA 1, 28). Once mining occurs; the Vessels Decision holds that the oil and gas leasing (43 CFR 3100) provisions of the MLA is no longer the appropriate authority under which BLM should authorize coal mine methane capture and use. In response, BLM is currently studying alternative means of authorizing coal mine methane capture and beneficial use.

In spite of this uncertainty, it may be possible for the mine operator to obtain competitive oil and gas leases from BLM for the unleased areas shown on Figure 3-9, Authorized Oil and Gas Leases within the Existing Coal Lease Application, which would allow the mine operator to drill methane wells in advance of mining. This would decrease the need for venting and draining methane once mining commences thereby improving mine safety, while potentially allowing for capture and beneficial uses, through pipeline injection, or for mine related uses such electric power generation, coal preparation, heating facilities and fuel for mine vehicles. Or, the mine operator may be able to make arrangements with the existing oil and gas lease holders to drill methane wells in advance of mining. Methane wells drilled into the coal seam or adjacent strata typically yield methane concentrations of 95 percent, or greater which is sufficient for pipeline injection. For those lands already leased for oil and gas, the mine operator would need to arrange with the oil and gas lease holders to drill methane wells in advance of mining. Negotiations could also include obtaining the use of methane gas in mining operations.

Gas Distribution

In order to send the gas from the methane degasification systems to a pipeline for ultimate sale, a gas treatment facility would be necessary because the gas emitted from the mine would not meet basic pipeline quality. The level of inert constituents in the gas (carbon dioxide, nitrogen, air, others) exceeds the pipeline standard limit of 3 percent for inert constituents.

There would also be a need for a gas compression facility. Typically pipelines need to have gas pressures at 500 pounds per square inch. In order to achieve 500 pounds per square inch, gas pressures at the degasification systems (wells) would require three-stage compression to achieve the needed compression. In addition, pipelines would be needed to convey gas to treatment and compression facilities. The nearest natural gas pipeline is approximately one mile from the mine; the capacity of the pipeline is unknown.

In addition to the uncertainties described above, the key issues to determine feasibility for pipeline injection are whether the methane gas can meet pipeline quality standards, and whether the costs of production, processing, compression, and transportation are competitive with other gas sources. Within the U.S., twelve active mines currently sell methane to a pipeline, making this the most popular use method (EPA 2008).

Economic Concerns

There are additional uncertainties regarding whether the volumes of methane being vented would warrant installation of compressors, gathering and transmission pipelines, and a gas treatment plant, since volumes vary so much with the mine operation, and are almost totally dependent upon the mine air circulation system. There are also issues related to permitting these facilities so not to interfere with mine operations.

BLM also researched using coal mine vent gas for electrical generation. There are numerous websites which show it being done, however none of them include any gas volume numbers or equipment requirement on which to base an analysis. No co-generation of electricity of data exists (gas quality needed, gas volumes, or equipment requirements) for coal mines as this is generally done specifically by electric companies. Using coal mine methane for electrical cogeneration is generally not used in the U.S. because electricity is available at low wholesale rates.

2.10 SECONDARY SCREENING

After an initial analysis, the following alternatives were carried forward for a closer look at potential environmental impacts. As stated at the beginning of this chapter, alternatives are compared with the Proposed Action (shown as shaded rows in Table 2-2, Alternatives Considered Summary) to determine if they have obvious advantages, have less environmental impacts, and are feasible and practicable to construct and operate. The potential alternatives considered in more depth include:

- Trucking coal over a designated private haul road
- Transporting coal with a conveyor system from the mine to Mack or other location
- Alternative rail route along the Proposed Jeep Trail Rail Alignment

Based on this secondary analysis, none of these three alternatives was determined to have a significant advantage or fewer impacts than the Proposed Action or the Alternatives carried forward for consideration.

2.10.1 Alternatives Considered Summary Tables

Table 2-2, Alternatives Considered Summary, shows all of the action alternatives that have been considered in response to the Proposed Action and public and agency comments. This screening results in one of three options for each alternative:

- Not analyzed in detail (NAID)
- Not carried forward from secondary screening – those alternatives determined not to have a significant advantage or fewer impacts than the Proposed Action or Alternatives carried forward for consideration (see Table 2-1, Alternatives – Secondary Screening)
- Analyze in detail – those components of the Proposed Action (shown as shaded rows in Table 2-2, Alternatives Considered Summary) which will be carried forward into the DEIS and analyzed further.

2.11 ALTERNATIVES CARRIED FORWARD FOR CONSIDERATION

2.11.1 Proponent Proposed Action

CAM proposes to mine and develop coal resources to supply power generation facilities by:

- Continuing to extract low-sulfur coal from existing Federal Coal Leases C 0125515, C 0125516, and C 0125439, extract additional coal from these existing and new federal coal leases (the “Red Cliff Mine”), and extract a small amount of coal from private land
- Constructing a railroad spur to transfer coal from the Red Cliff Mine to the UPRR line near Mack, Colorado
- Constructing new portals to access the coal reserves
- Constructing surface support facilities
- Developing or having auxiliary facilities to support the proposed mining
- Methane venting to comply with safety and health standards (no treatment)

These proposed activities are further detailed in subsequent sections.

2.11.2 Expand Coal Mining Production

Mining of approximately 8,000,000 tpy of clean coal from the Red Cliff Mine is proposed. Increasing production of the U.S. coal reserves is an objective of the Energy Policy Act (2005), and increasing production from these coal reserves furthers the objective of the Act. The future coal leasing area is approximately 23,000 acres and contains recoverable coal reserves that would provide adequate reserves for a 30-year mine life. These reserves would be accessible from the proposed Red Cliff Mine portals.

The McClane Canyon Mine (MCM) coal provides resources for Xcel Energy's Cameo Power plant. CAM plans to continue to deliver coal to the power plant by truck as long as the plant continues operation and CAM has the supply contract, averaging 230 truckloads per week. CAM plans to operate MCM as long as the Cameo Power plant is operational and/or until the economic recovery of coal is no longer feasible. If the Cameo Power plant is shut down while economically recoverable coal is still available at the MCM, CAM may truck coal from MCM to the Red Cliff Mine loadout. When the MCM is shut down, trucks would haul coal to the Cameo Power plant from the Red Cliff Mine. With increased production and the railroad connection, coal produced from the Red Cliff Mine could be transported (sold) to power plants in the eastern and western portions of the country. The clean (washed) coal is high-quality, low-sulfur coal with a heating value of 11,000 to 11,500 British thermal units (Btu).

The proposed Red Cliff Mine project area, in relation to the MCM , is located approximately 11 miles north of the towns of Mack and Loma, Colorado, and 1.5 miles east of Colorado SH 139, as shown on Figure 1-3, Red Cliff Mine Project Location. Development of the Red Cliff Mine would require a capital investment of approximately $160 million (2006 dollars) during construction. An anticipated 200 to 250 full-time employees would be needed for operation of the Red Cliff Mine.

Coal reserves would be recovered through underground mining in the Cameo Seam using both room-and-pillar and longwall mining techniques. Conventional room-and-pillar mining would utilize continuous miners and shuttle cars with belt haulage. Longwall gate entries and bleeders would be developed with continuous miners and shuttle cars. Longwall mining uses a drum shearer, conveyors, and shields. Retreat mining is conducted to attain the maximum recovery consistent with the safety and protection of mine personnel and surface protection. Further information on these two mining techniques is included in Appendix C, Mining Operations and Subsidence. The production rate at the mine would be controlled by market conditions. The minimum production rate would be about 2,000,000 tpy, with an expected maximum production of 8,000,000 tpy. Figure 2-8, Initial Mine Plan, displays the estimated coal mining sequence and production rates for the first six years. The initial mine plan projects that production will reach a maximum of 3,000,000 raw tpy during the first five year permit term. The mine permit will be revised later to develop access to the east towards Big Salt Wash where the majority of the area's coal reserves (currently unleased) lie.

Recovery of the coal reserve will cause surface subsidence. Subsidence is related to the coal extraction ratio, overburden depth, and the geologic setting. The mine can be designed to control or minimize surface subsidence. Important surface features, including Big Salt Wash, would be protected by careful mine design. Most of the area to be undermined is steep mountainous terrain where mine design to control or minimize subsidence would not be required. Some gas wells overlying the mine area may be plugged or "mined around." MSHA Rules (30 CFR 75.1700) require underground mines to maintain a 300-foot-diameter solid coal barrier around all active or inactive gas and oil wells, unless a smaller barrier is approved by MSHA. Additional information regarding subsidence is included in Appendix D, Subsidence.

2.11.3 Railroad Spur

General Information

Significant mining of these coal reserves has not occurred because of the remote location and difficulties and cost to transport the coal to market. A key element of the proposal is the railroad spur from the Red Cliff Mine to the railroad main line near Mack, Colorado.

A railroad spur is proposed to connect the Red Cliff Mine to the railroad main line near Mack, Colorado, to cost-effectively transport coal into the market. The proposed railroad spur would traverse approximately 9.5 miles of BLM land and approximately 5 miles of private land. The railroad would cross BOR- and BLM-administered lands, which are outside of the proposed coal lease area and therefore require ROW approval on these federal lands.

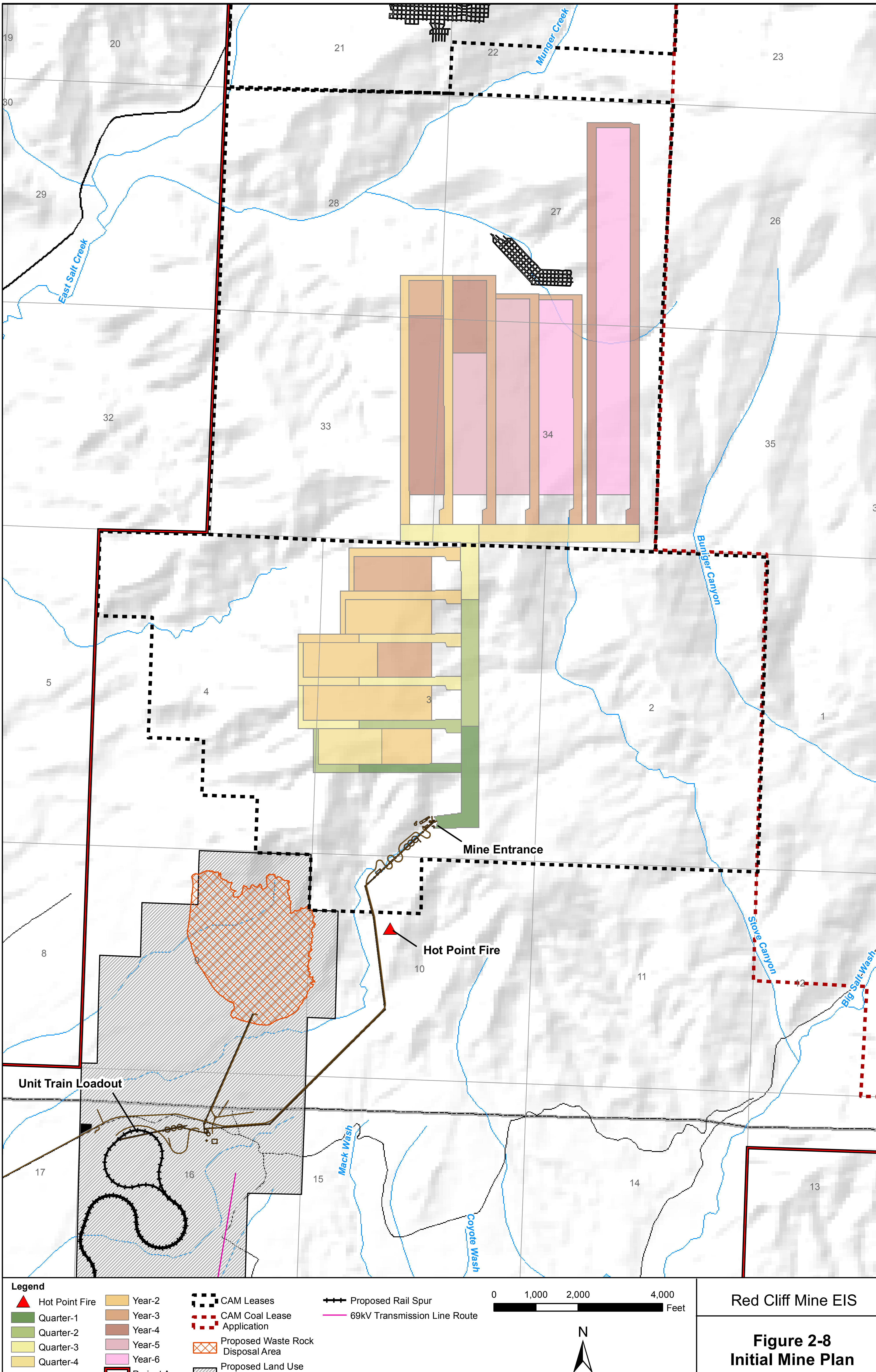
It is proposed to load the coal onto rail cars at the mine site and transport the coal via the railroad spur to the main rail line connection. The loadout would be comprised of a coal stockpile, reclaim tunnel, conveyor belt(s), and loadout tower. Ethylene glycol would be applied to the coal and coal cars to minimize freezing during winter months. These products are stored in sealed 500 gallon tanks located near the loadout structure. There would be an average of four trains per day (two full and two empty) at a maximum production rate of 8,000,000 tpy, traveling at a speed of approximately 20 miles per hour (mph) full and 25 mph empty. Each car carries approximately 100 to 110 tons of coal, and each train would typically consist of between 100 and 120 cars, with three, four, or five locomotives. Trains would typically be 6,500 to 7,700 feet in length.

The trains would cross public roads in four locations. Proposed crossings include a grade-separated crossing with SH 139 and at-grade crossings for CR 10, CR T, and CR M.8. Two-quadrant automatic gate systems are proposed to be installed at the CR 10 and CR M.8 at-grade railroad/county road crossings. The train would cross through these intersections a maximum of four times per day and would not stop on the track as they cross the county roads. The amount of time that the trains would block the county roads would vary according to speed, number of cars in the train, and whether the southbound loaded trains would need to stop between CR 10 and CR M.8 for mainline access. Estimates are that the trains would block CR M.8 for 5.5 to 6.5 minutes, and would block CR 10 for 6.5 to 7.0 minutes.

CR T is a two-track dirt road at the proposed railroad crossing. Due to its location and extremely low traffic volumes, a standard “cross-buck” crossing is proposed.

The longest proposed train would consist of 115 to 120 cars and 5 locomotives for a total length of 7,300 to 7,700 feet. The distance between CR 10 and CR M.8 is approximately 13,500 feet so a train could not block both crossings at the same time.

The standard procedure when a train is going to or coming from the UPRR will have the loaded coal train wait north of CR M.8 until the UPRR Dispatcher authorizes the train to enter the UPRR main line (UPRR requires trains to enter or leave the main line as quickly as possible). Upon receipt of authorization from the UPRR Dispatcher, the train would proceed across CR M.8 and join the UPRR main line. If the train is eastbound, it would also cross Highway US 6 and 50 on the existing main line crossing.



Red Cliff Mine EIS

Figure 2-8
Initial Mine Plan

The potential for lengthy closures of CR 10 and CR M.8 due to crossing repairs is expected to be minimal. The usual procedure when crossing repairs are required is to work half of the crossing at a time. This allows traffic to continue to use the crossing, although alternating traffic direction will cause some delay; similar to the delay often encountered during highway maintenance. If for some reason a crossing must be taken out of service for a long period of time, a shoofly could be constructed and traffic flow would be maintained.

The at-grade crossings have been designed to provide the maximum sight distance possible. The average vehicle volume on these highways is low, and sight distance is generally good. Proposed installation of crossing warning devices and two-quadrant gate systems with pavement markings at the two at-grade crossings would provide additional safety measures. Figure 2-9, Grade Crossing Safety Devices, depicts typical grade crossing safety devices to be installed. Active warning devices that would give advanced warning of “train on track” would be installed along the county roads before the crossings. A “wye” would be constructed to link the railroad spur with the main line at Mack to allow uninterrupted train flow in all directions.

To improve the sight distance at the CR 10 crossing, CAM has worked with Mesa County to realign CR 10 (Figure 2-3, County Road 10 Realignment). This realignment would provide a longer time for vehicular traffic to see the crossing and allow CR 10 to cross the tracks at an angle closer to 90 degrees.

The visual aspects of the rail line at the Mack Mesa Reservoir Recreation Area should be minimal. The track should not be that noticeable when no train is present (it may not look much different than the nearby roads). A train will be visible from some locations in the park while it passes.

The proposed rail line passes a small airstrip near Mack. The track, which is the permanent structure, and the train should not impact the cone of influence for the flight path, as the railroad grade is approximately 100 feet lower than the runway.

If a train derailment occurs and diesel fuel is spilled, it will have to be cleaned up and all contamination removed. This is similar to a semi-truck accident in which fuel is spilled. While a locomotive has 4,000 gallons of fuel versus 150 gallons in a semi-truck, the locomotive fuel tank is steel and is shielded by an outer covering of steel. The fuel tanks on a semi-truck are aluminum.

Rail Alignments

Following UPRR guidelines for rail grades, slopes, and curves, a railroad alignment was developed that would avoid, to the maximum extent practicable, key drainages, state parks, irrigated lands, and individual residences.

Additional data and information have been collected since the initial rail alignment was proposed in CAM’s application for ROW, *Application for Transportation and Utility Systems and Facilities on Federal Lands*, submitted to BLM by CAM on September 27, 2005 (CAM 2005).

The proposed rail alignment was modified to mitigate safety and environmental concerns. The following changes have been made to the proposed alignment:

- A loop track near the loading facility at the mine site was designed.

- In response to safety concerns, the alignment was modified to construct a grade-separated crossing at the intersection of the proposed rail alignment and SH 139.
- The proposed alignment was modified to minimize impacts to wetland areas.

Grades were adjusted to comply with UPRR standards.

- The proposed alignment was modified to balance the earthwork for construction.

Figure 2-1, Rail Alignment Revisions and CR 10 Realignment, depicts these various modifications.

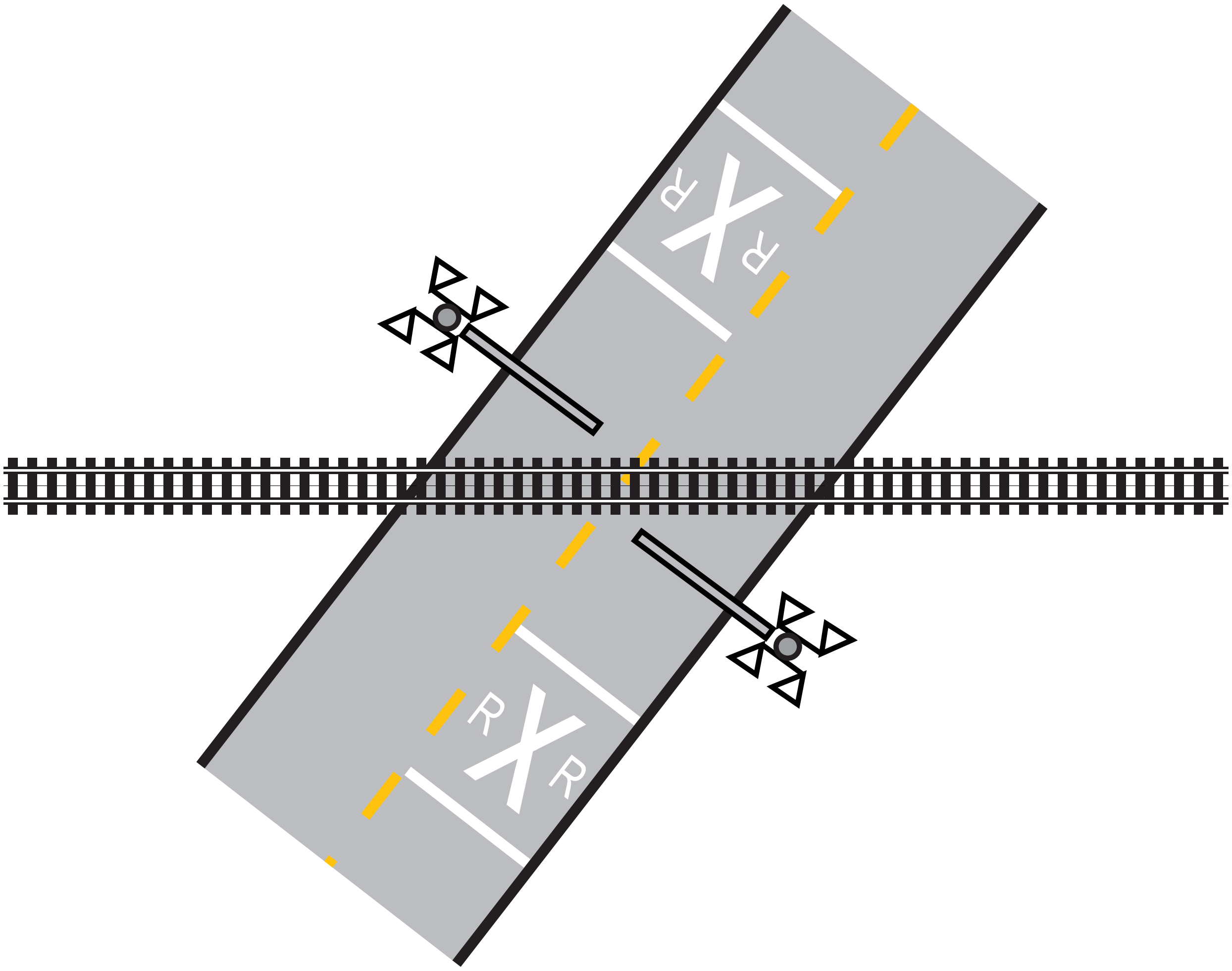
Cuts and Fills

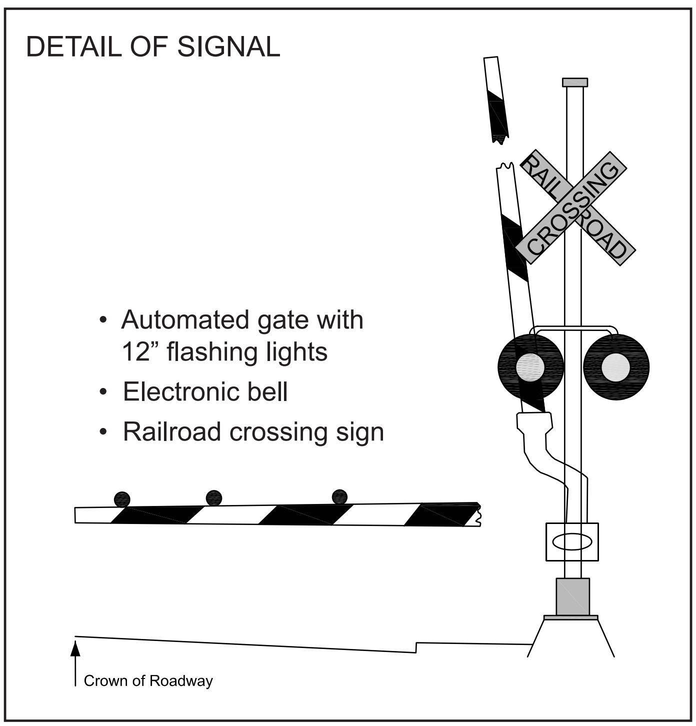
To construct the rail alignment, cuts and fills would be necessary to provide a level, gently sloping railbed. Railroad standards permit no more than a 2-percent grade. Maximum curve radius will not exceed 10 degrees (573 feet), with 6 degrees (955 feet) preferred. The railbed width would be approximately 24 feet. Fill slopes would be 2 (horizontal) to 1 (vertical) (2H:1V) unless conditions warrant flatter slopes. Cut slopes would be not less than 1.5H:1V in common material, with steeper slopes allowable in rock cuts. See Figure 2-10, Typical Cut & Fill Sections, for depictions of typical sections. Cuts and fills vary, with 25- to 50-foot-deep cuts and fills being common. The deepest cuts and fills are located in the loadout area, where 90-foot-deep cuts are projected.

Utilities such as gas lines in the cut and fill areas would be relocated, cased, or both. CAM owns or has easements across the private lands along the applicant-proposed alignment, so there would be little need to relocate or case irrigation pipelines or relocate overhead transmission lines on private properties. Culverts would be installed under the railbed at the location of each significant ephemeral channel; and bridges or concrete boxes would be constructed at major drainages and the SH 139 underpass.

Construction Information

A sequential construction process would provide for cut and fill, compaction, and track laying along the railroad corridor. Earth moving for the railbed would be performed with a fleet of articulated six-wheel-drive dump trucks that would be loaded with a large, tracked backhoe or front-end wheel loader. Two push-pull scrapers would likely assist the earth-moving operation. The push-pull scrapers may be the best equipment for topsoil salvage. The equipment spreads shown in Table 2-3, Earth Moving, have the capacity to excavate, place, and compact approximately 20,000 cubic yards per day. There are approximately 2,400,000 cubic yards to move. While the cuts and fills would be balanced, some topsoil would need to be stored along the railroad. Therefore, the equipment spreads would be on-site approximately 120 work days, or 6 months, assuming two 10-hour shifts per day; five days per week. The anticipated earth-moving spread is shown on Table 2-3.





ILLUSTRATIONS NOT TO SCALE

Red Cliff Mine EIS

Figure 2-9
Grade Crossing Safety Devices

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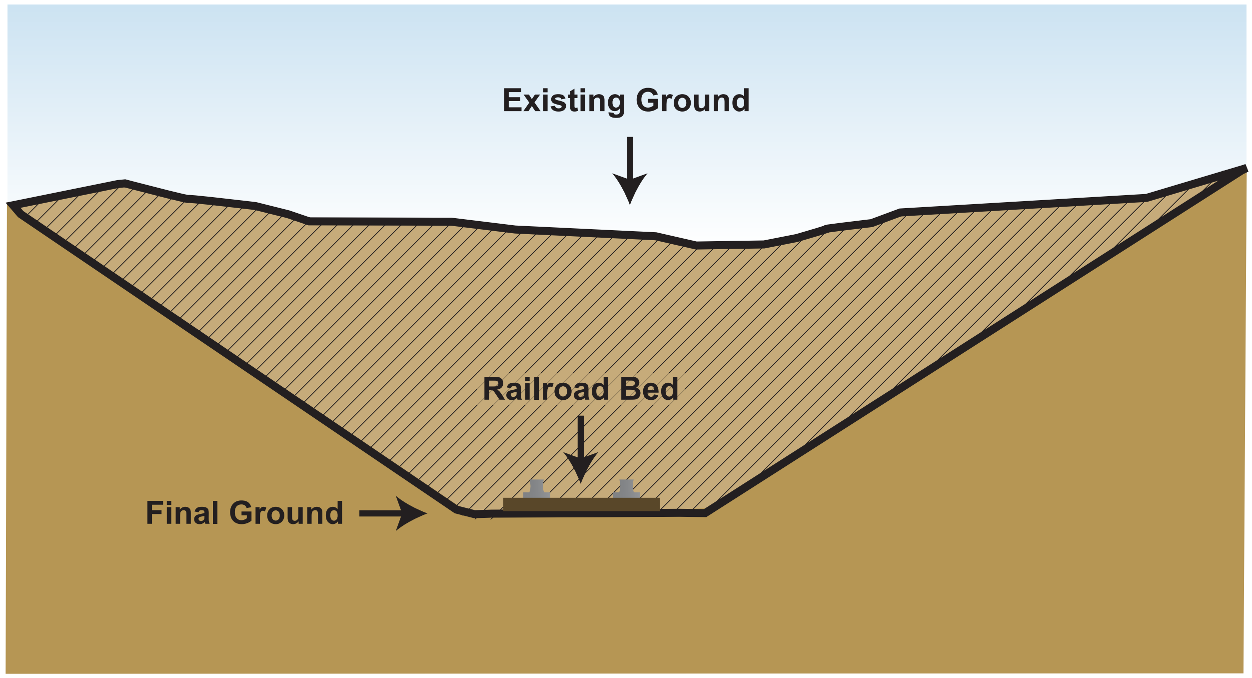
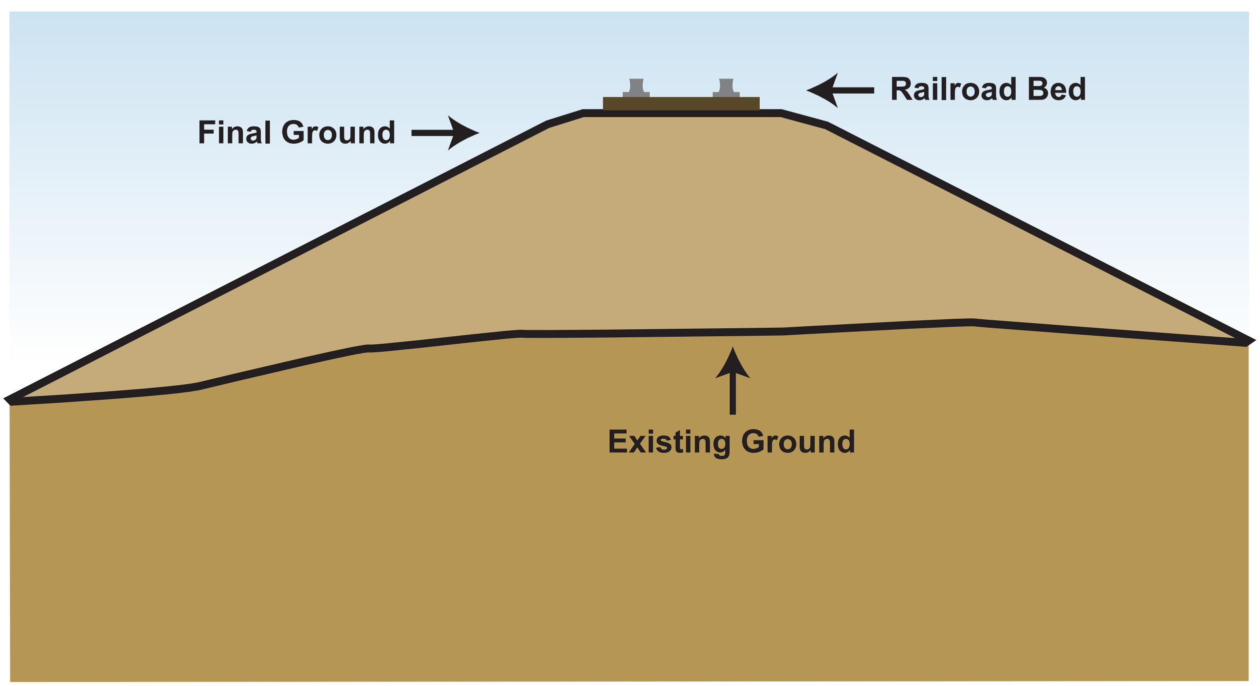
TYPICAL CUT SECTION



TYPICAL FILL SECTION



Red Cliff Mine EIS

Figure 2-10
Typical Cut & Fill Sections

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Table 2-3
EARTH MOVING

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Track Excavator Backhoe	2	2	40	325
Articulated Dump Trucks	12	2	240	380
Motor Grader	2	2	40	180
Compactor	2	2	40	310
Water Truck	2	2	40	400
Fuel/Service Truck	2	2	40	350
Light Plants	8	1	80	100
Supervisor/Pickup	2	2	40	N/A
Push Pull Scrapers	2	2	40	700

Note:
*For each piece of equipment.

Runoff from construction would be minimized and filtered through the installation of Best Management Practices (BMPs). The crew would install silt fences, berms, catch basins, seeding, mulching, and erosion-control netting. Temporary and long-term stormwater controls would be implemented in accordance with appropriate state and federal requirements; permits for these requirements are listed in Chapter 1 (Table 1-1, List of Permits and Approvals). The compliance crew is shown in Table 2-4, Compliance.

Table 2-4
COMPLIANCE

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Track Excavator Backhoe	1	0.5	5	50
Laborers	4	1	40	N/A
Supervisor/Pickup	1	1	10	N/A

Notes:
*For each piece of equipment.
N/A = not applicable

Construction of the railroad spur would also require construction of bridges. One bridge would cross Mack Wash and would be constructed of precast concrete beams supported by concrete-capped piles with a center support in Mack Wash. Another bridge would be constructed over the Highline Canal, also supported by concrete-capped piles. The third structure would be a grade-separated crossing on SH 139. This structure would also be constructed of concrete. It is estimated each structure will take about two months to construct, for a six-month total duration for the bridge crew, as shown in Table 2-5, Bridge Construction.

Table 2-5
BRIDGE CONSTRUCTION

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Crane/Pile Driver	1	1	10	175
Front-end Wheel Loader	1	1	10	200
Concrete/Gravel Trucks	3	0.3	9	400
Delivery Trucks	1	0.2	2	350
Laborers	6	1	60	N/A
Supervisor/Pickup	1	1	10	N/A

Notes:
*For each piece of equipment.
N/A = not applicable

A culvert installation crew would support both the rail and portal road construction projects. The rail project requires about 150 culverts that would consume most of the culvert installation crew's time. It is estimated the culvert installation crew would be on-site for six months, as shown in Table 2-6, Culvert Installation.

Table 2-6
CULVERT INSTALLATION

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Front-end Wheel Loader	1	2	20	200
Track Excavator Backhoe	1	2	20	135
Compactor	1	2	20	75
Delivery Trucks	1	0.5	5	350
Laborers	4	2	80	N/A
Supervisor/Pickup	1	2	20	N/A

Notes:
*For each piece of equipment.
N/A = not applicable

Track construction would be a labor and truck-delivery intensive operation. Over 4,000 semi-truck loads of material would be required to deliver all of the sub-ballast and track material to the site. The actual track-laying operation would involve stringing material (ties, tie plates, spikes, etc.) out for the length of the track. Most of the ties would likely be constructed of concrete. The rail would probably be delivered by rail in 1,400-foot, continuously welded sections; however, it is possible that it might be delivered by truck in 39-foot sections and welded in place. For Table 2-7, Track Material Delivery, it is assumed that ballast and rail would be delivered by rail. Ties and other track material would be delivered to Mack by rail and transloaded to trucks for delivery to the work site. The duration of this work is anticipated at six months, as shown in Table 2-8, Track Construction.

Table 2-7
TRACK MATERIAL DELIVERY†

Item	Loads	Equipment	Horsepower*
Sub-ballast, 90,000 tons	3,600	Gravel Trucks	380
30,000 Concrete Ties	500	Delivery Trucks	400
12,000 Wood Ties	60	Delivery Trucks	400
Tie Plates, Switches, etc.	30	Delivery Trucks	400
Total	4,190		
Average (loads per day per six months)	32		

Notes:
*For each piece of equipment.
†Rail and ballast assumed to be delivered by rail.

Table 2-8
TRACK CONSTRUCTION

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Speed Swing	2	1	20	N/A
Ballast Tamper	2	1	20	N/A
Ballast Regulator	1	1	10	N/A
Track Liner	1	1	10	N/A
Spike Machine	1	1	10	N/A
Tie Machine	1	1	10	N/A
Front-end Loader	2	1	20	100
Fork Lift	2	1	20	75
Laborers	30	1	300	N/A
Supervisor/Pickup	1	2	20	N/A

Notes:
*For each piece of equipment.
N/A = not applicable

2.11.4 Auxiliary Facilities

The mine operations would require water, electricity, and access roads. These auxiliary facilities are discussed in this section.

Water Line

Adequate water resources are not available at the Red Cliff Mine site, so water must be piped to the mining operation. CAM has a 3.0 cubic foot per second (cfs) absolute water right on Mack Wash, near Mack (Case No. 03CW228). A portion of those waters, totaling approximately 700 acre–feet per year (approximately 1 cfs), would be piped to the Red Cliff Mine site for use during mining operations. A water diversion structure would be constructed in-channel on the west bank of Mack Wash, just north of the CR M.8 bridge. The pump and waterline system would have a capacity of approximately 750 gallons per minute (gpm). The diversion/pump would be connected to a meter and water pipeline. The pipeline would be constructed of steel and polyvinyl chloride (PVC) and would be buried along the railroad spur alignment. It would extend to a water tank above the mine portals. This pipeline would supply all of the water needs for the mine operation and would be pumping water more or less continuously throughout the year. The system would remain in operation for the life of the mine. BMPs would be utilized during construction to minimize impacts to in-channel and riparian habitat and to prevent bank degradation. CAM will obtain a permit from the USACE prior to constructing the diversion structure in Mack Wash.

A water tank would be located at the Red Cliff Mine site above the portal level. The water tank would be a fabricated steel tank constructed on a concrete or oiled-sand base. The tank would be approximately 52 feet in diameter and 32 feet high, providing a capacity of approximately 500,000 gallons. A smaller water tank would also be constructed near the coal preparation plant.

Transmission Line

GVP is the local provider of electricity and electrical transmission services, and CAM asked GVP to provide electrical services. GVP determined that existing transmission lines in the area of the Red Cliff Mine are not adequate to meet the needs of the proposed Red Cliff Mine. With input from CAM, GVP evaluated electrical needs, substation capacities, and transmission line alignments for the proposed project and determined that the power could best be supplied from the Xcel Energy Uintah Substation at Fruita.

A 69,000 volt (69 kilovolt [kV]) transmission line would be required to supply the required power. Figure 2-11, Typical Transmission Pole Configuration, depicts typical pole and conductor facilities for a 69kV transmission line. To reach the Red Cliff Mine, a portion of the transmission line would cross BLM-managed lands. A ROW application for the transmission line has been submitted to BLM.

The GVP-preferred alignment is shown in Figure 1-1, Proposed Action. The transmission line would be dedicated to supplying power to the Red Cliff Mine; there would be no additional users along the line. The proposed line would be designed for an underbuild distribution circuit (12kV) from the Uintah substation to a point just south of the Highline Canal. This circuit would distribute electrical power to local businesses and residents. Figure 2-11, Typical Transmission Pole Configuration, depicts a typical pole and conductor facility for the underbuild section. There would be no underbuild circuit north of the Highline Canal on BLM-managed lands.

The primary substation would be constructed at the end of the alignment shown in Figure 1-1, Proposed Action. A substation contains electrical transformers to reduce the line power to a suitable voltage. High-voltage overhead transmission lines would be extended from the primary substation to pad or pole-mounted transformers to provide electrical power to the mine facilities. Gravel-surfaced, fenced areas would secure electrical transformers. The outside dimensions of a typical facility are 50 feet by 50 feet.

Typical Transmission Pole and Conductors

Typical Transmission Pole and Conductors with Underbuild Distribution Line

Red Cliff Mine EIS

Figure 2-11
Typical Transmission Pole Configuration

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The transmission structures for this project would be primarily wood poles. In some cases, where there are physical limitations on guying/anchoring, galvanized steel poles may be used. A specific design would be completed for the selected route to determine structure locations and where wood and steel poles would be used. Some of the steel poles could be directly embedded (similarly to wood pole construction), and some would be set on a foundation. Generally, the structures on tangent (along a straight line) would be self-supporting. Angle structures, where the line turns, are generally supported with guy wires.

The average pole would be approximately 61 feet above ground to the top of the pole (a 70-foot pole embedded 9 feet into the ground) for a structure with an underbuild circuit and 56.5 feet above ground to the top of the pole (a 65-foot pole embedded 8.5 feet into the ground) for structures without the underbuild circuit. Minimum line-to-ground clearance for the 69kV line is 20.1 feet, with minimum clearance of 28.1 feet for railroad crossings. Minimum line-to-ground clearance for the 12kV underbuild circuit is 18.5 feet, with minimum clearance of 26.5 feet for railroad crossings. The underbuild circuit would be constructed no less than 9 feet (at the pole) below the lowest 69kV insulator. Approximately 15 structures per mile would be required on the BLM portion of the route, with approximately 17 structures per mile on the portion of the route with the underbuild circuit.

Transmission Line Construction

The general sequence to construct and energize an overhead transmission line is described in this section. These activities will not take place until an alternative has been selected and BLM has issued a ROW grant for construction/operation on federal lands.

Line Survey

- Specifications for the transmission line design are derived from a survey of the area.
- The survey is required to develop models for the design of the overhead transmission line, facilities, analysis, and proposed line routes. In this case, a survey would not be completed until an alignment alternative is selected.

Right-of-Way

- Once an alternative has been selected and approved, ROW easements are procured. In some cases, it may be necessary to negotiate with individual property owners if county or federal easements are not available along the selected route. Typical ROW width for a 69kV line is 100 feet.
- Access roads, overland travel paths, stringing turn around points, and staging areas are designated.
- Vegetation is cleared to accommodate necessary travel for construction, inspection, line maintenance, and line clearance problems.

Preparation

- Long term and temporary access roads are built.

- Material storage sites, often with security measures such as fences and/or temporary storage buildings, are erected.
- Staging areas are cleared for vehicles, equipment, and assembly of some components.
- Lay-down areas for transmission structures are prepared.

Construction

- Materials and equipment are delivered to the job site staging areas.
- Poles are unloaded at lay-down areas.
- Transmission poles are framed.
- If steel structures are used, then foundations for the structures are installed, bases are grounded and the structures are erected. Holes are then augured into the earth where poles are set.
- After poles are set, holes are backfilled and compacted.
- Structures are prepared for stringing.

Stringing

- Before conductor installation begins, temporary clearance structures are installed at road crossings and other locations where the new conductors may accidentally come into contact with electrical or communication facilities, or vehicular traffic during installation.
- Actual conductor-stringing operation begins with the installation of sheaves or stringing blocks. The sheaves are rollers attached to the cross arm of the supporting structure. The sheaves allow the individual conductor to be pulled through each structure until the conductor is ready to be pulled up to the final tension position.
- When the pull and tension equipment is set in place, a sock line (a small cable used to pull in the conductor) is pulled from pole to pole using ground equipment.
- After the sock line is installed, the conductor is attached to the sock line and pulled in, or strung, using the tension-stringing method. This involves pulling the conductor through each pole under controlled tension to keep the conductor elevated above crossing structures, roads, and other facilities.
- After the conductor is pulled into place, sag is adjusted to a pre-calculated level. The conductor is clamped to the end of the hardware of each insulator as the sheaves are removed.
- The final step of the conductor installation is to install vibration dampers and other accessories.

Energizing Conductors

- Operational procedures are followed in energizing the lines. Step-by-step written operational procedures are followed during the entire process to assure a safe startup.

- The line is visibly inspected to ensure that all personnel, vehicles, equipment or other items are clear of the line.
- Testing may be conducted on all or parts of the line to assure integrity of the line, prior to placing the line in service.

Property Restoration

- Restoration of all property disturbed by construction includes cleanup operations involving final grading to original contours and cleanup of all disturbed areas, including temporary workspace and the access road.
- The utility conducts a final survey to ensure that cleanup activities have been successfully completed as required.
- Temporary access roads and staging areas are re-vegetated and reclaimed as required.

Typical Construction Equipment

Typical construction equipment includes the following:

- Pickups and line trucks
- Dozer – road grading/shaping/pulling equipment
- Boom truck – all construction activities
- Flatbed/boom truck – haul and unload materials
- Semi-tractor trucks and trailers – haul structure components
- Construction trucks and trailers – haul materials
- Tilt-bed and lowboy trailers – haul equipment
- Rigging truck – haul tools and equipment
- Stinger crane/flatbed truck – material placement
- Mobile crane – erect structures/load and unload materials
- Digger/derrick truck – erect structures/excavation as required
- Backhoe – excavation as required
- Reel trailer – haul and install conductor
- Tensioner – pull conductor
- Aerial lift trucks – erect structures/string conductor
- Fork lift – material handling

GVP estimates that construction of the transmission line will take approximately six months. Once the line is in service, regular inspection of the line is typically conducted twice yearly, and maintenance is provided as needed.

Access Road and Haul Roads

Access roads, haul roads, and mine facilities are displayed in Figures 2-12 through 2-16, Proposed Mine Facilities, Maps 1 – 5.

There are four haul roads proposed to provide truck access to the mine and facilities. Haul Road #1 would be the main access to the mine facilities. Mine employees, contractors, vendors, supply vehicles and visitors would utilize this road. Access to the Red Cliff Mine site would be via SH 139. At approximately mile marker 12, CR X (a.k.a. Mitchell Road and Power Line Road) intersects SH 139. A 4.5 mile long portion of CR X would be widened, graveled, and paved to provide access to the mine site. The grade of the road would vary from nearly flat to a maximum grade of 10 percent near the mine site.

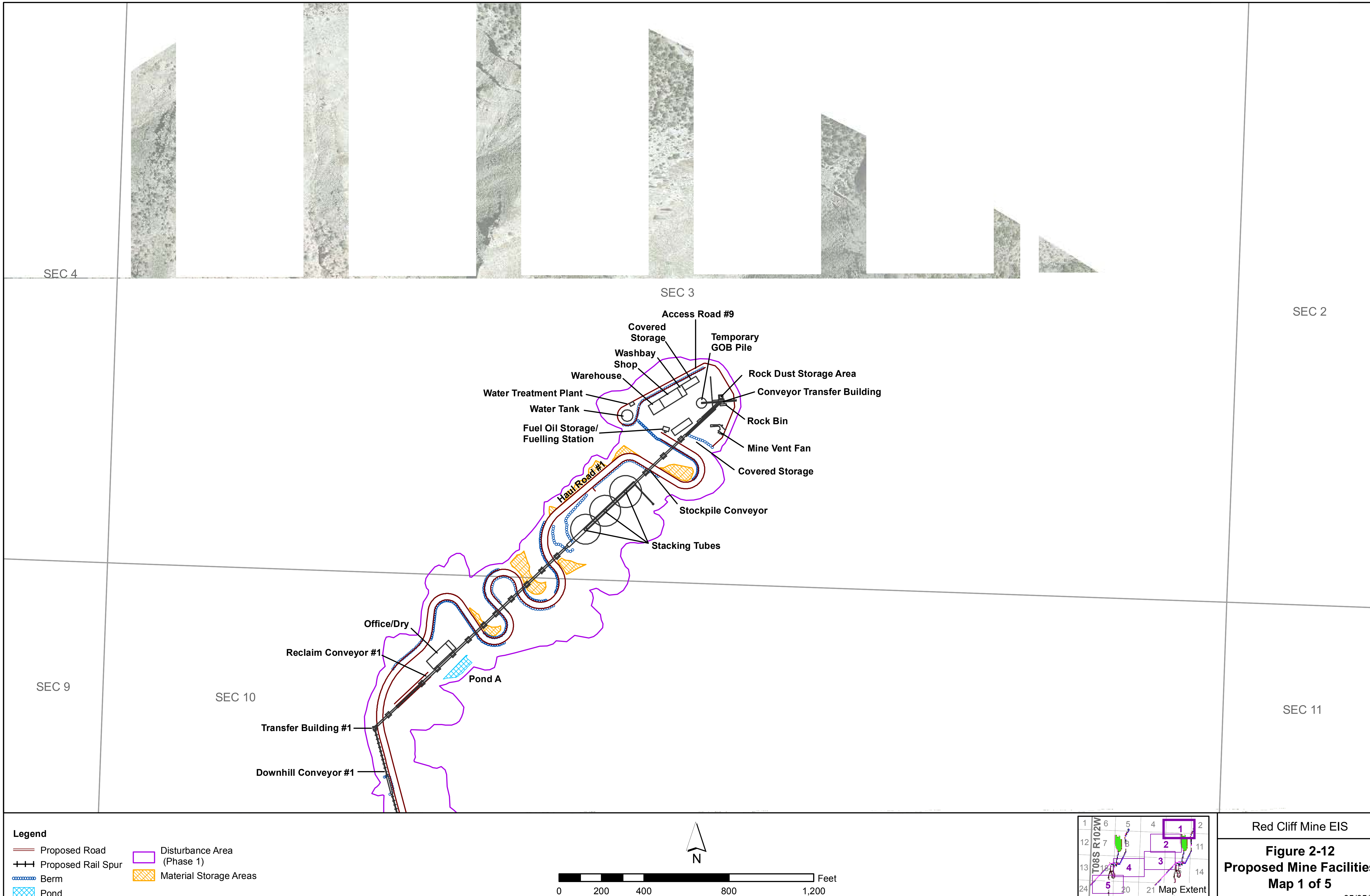
Three other haul roads would be constructed to connect the main haul road to the waste rock pile, the main haul road to the preparation plant bench, and the preparation plant bench to the clean coal stockpile. The truck traffic which will utilize these roads includes 10 and 18 wheel trucks.

There are nine access roads that would provide a variety of uses. Three of the roads would be transition roads to provide access from the mine facilities to an existing road. The remaining six roads would provide access to mine facilities including the unit train loadout, clean coal reclaim tunnel, pond G, waste rock conveyor, clean coal conveyor, and the water tank/water treatment system.

Access roads and haul roads are typically 20 to 24 feet wide (traveling surface), with an earth berm or guardrail on the outside slope and a drainage ditch on the inside. The roads would be plated with gravel surfacing or would be paved. To control fugitive emissions, roads would be watered using water from the water pipeline and cleaned as necessary. Dust suppression would be used on heavily traveled roads to control air pollution. Roads would be constructed and maintained in accordance with Mesa County, BLM, and MSHA standards, as applicable and appropriate.

2.11.5 New Mine Portals and Benches

In association with the coal mine operation at the Red Cliff Mine, CAM is proposing to construct new portals to access the coal reserves. Five or more side-by-side entries, 18 feet wide by 8 to 10 feet high, spaced 50 feet to 120 feet on center would be used to access the coal reserve. To begin construction of the portal road and benches, large backhoes would be used. At least one of the backhoes would be equipped with a rock breaker. Rock blasting would be frequently required for this work task, because each outcrop ledge that is encountered would likely require blasting. Blasting would be done in accordance with BLM Standard Design Practices. A dozer would assist with the road-pioneering work, and articulated dump trucks would be used to haul and place material. It is estimated the portal road and benches could be constructed in about six months. Materials from the mine construction would be used in the fills to form the benches, as shown in Table 2-9, Portal Road and Benches.



Red Cliff Mine EIS

Figure 2-12
Proposed Mine Facilities
Map 1 of 5

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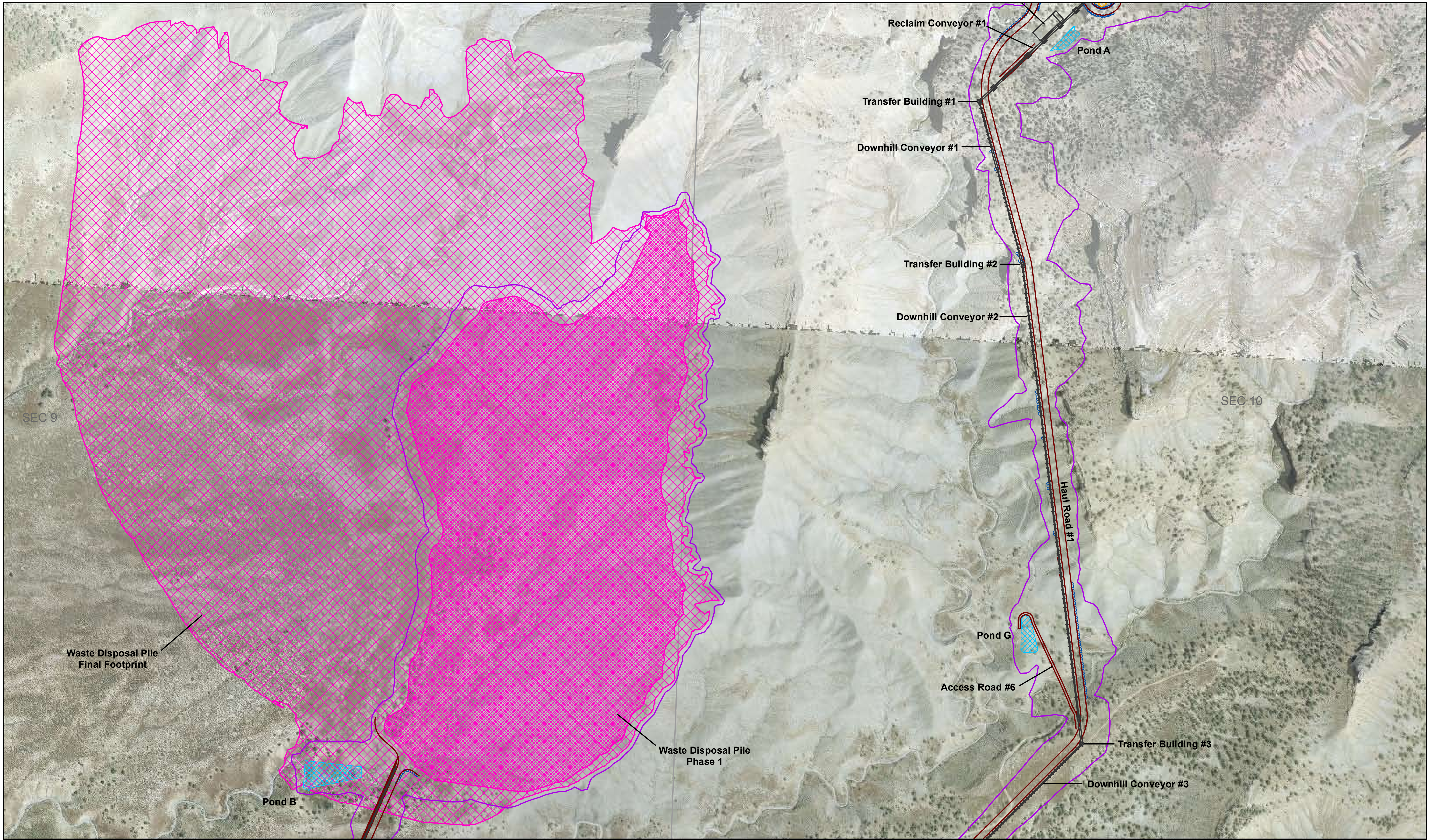
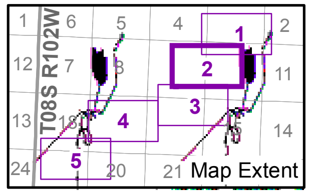


Legend

- Proposed Road
- Proposed Rail Spur
- Berm
- Pond
- Disturbance Area (Phase 1)
- Material Storage Areas
- Proposed Waste Rock Disposal Area (Phase 1)
- Proposed Waste Rock Disposal Area

N

0 200 400 800 1,200 Feet



Red Cliff Mine EIS

Figure 2-13
Proposed Mine Facilities
Map 2 of 5

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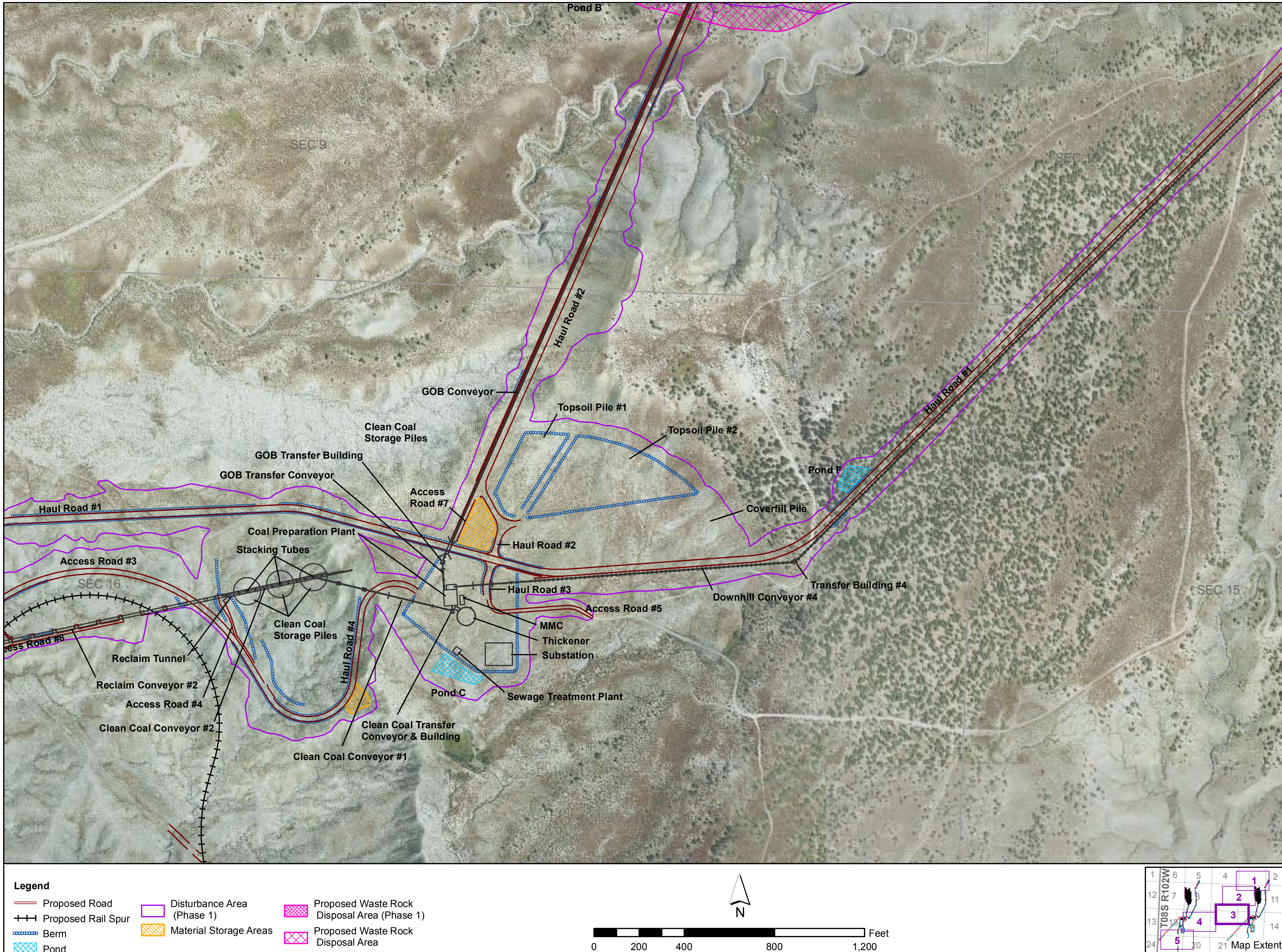

Red Cliff Mine EIS

Figure 2-14
Proposed Mine Facilities
Map 3 of 5

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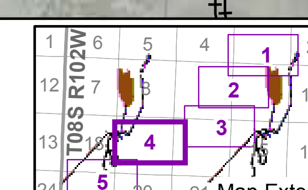
Legend

- Proposed Road
- Proposed Rail Spur
- Berm
- Pond
- Disturbance Area (Phase 1)

N

0 200 400 800 1,200 Feet



Red Cliff Mine EIS

Figure 2-15
Proposed Mine Facilities
Map 4 of 5

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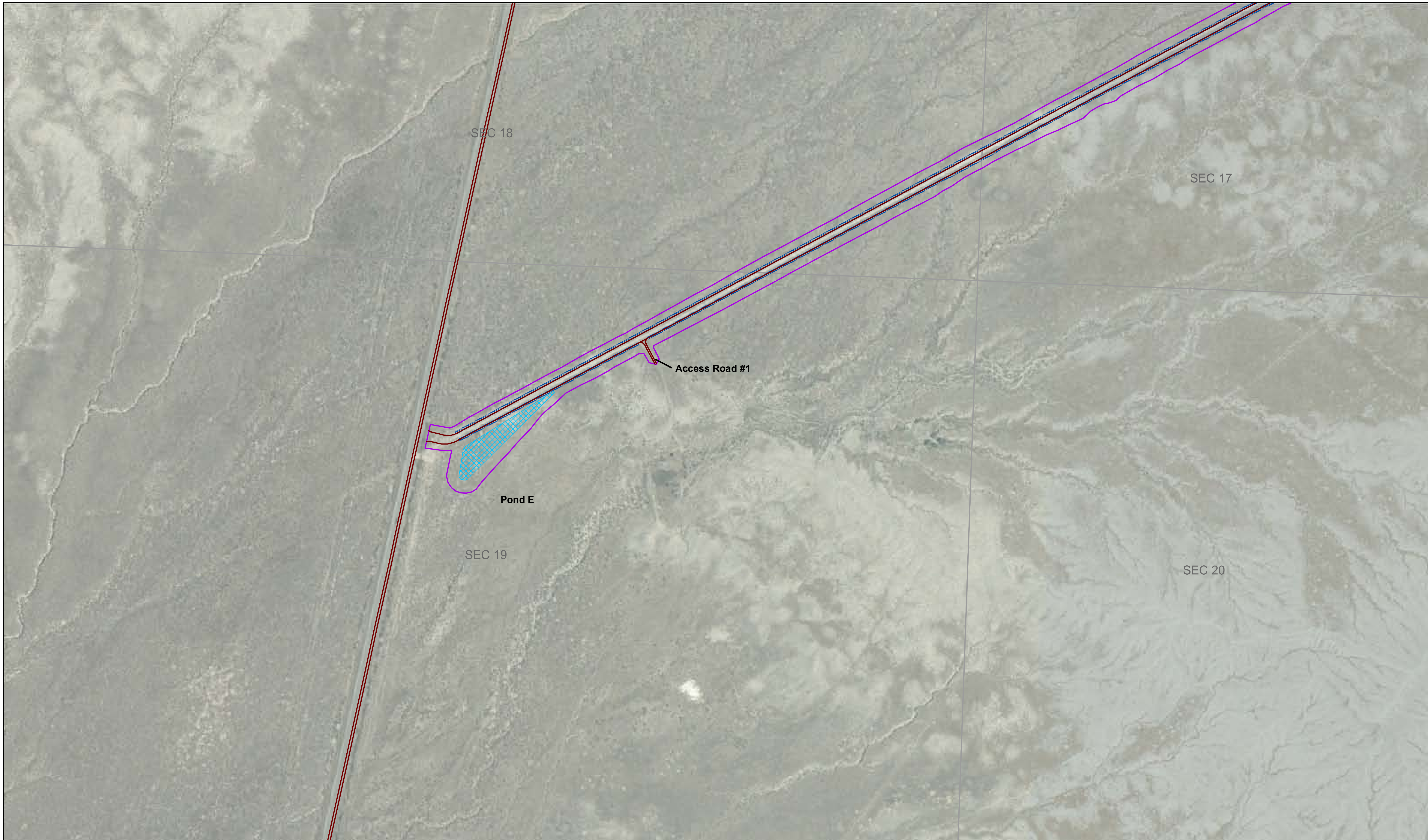
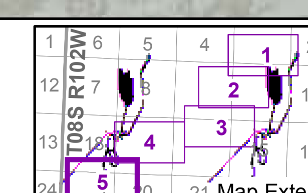


Legend

- Proposed Road
- Proposed Rail Spur
- Berm
- Pond
- Disturbance Area (Phase 1)

N

0 200 400 800 1,200 Feet



Red Cliff Mine EIS

Figure 2-16
Proposed Mine Facilities
Map 5 of 5

05/05/08

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Table 2-9
PORTAL ROAD AND BENCHES

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Track Excavator Backhoe	1	1	10	325
Track Excavator Backhoe	1	1	10	195
Articulated Dump Trucks	2	1	20	380
Blasting Equipment	1	1	10	220
Truck Tractor/Dozer	1	1	10	350
Compactor	1	1	10	310
Supervisor/Pickup	1	1	10	N/A

Notes:
*For each piece of equipment.
N/A = not applicable

Five benches would be constructed. The first or upper bench would be a utility bench for a water tank. The second bench or portal bench would contain a shop, warehouse, ventilation fan, rock dust storage silo, and other facilities. Portions of the portal bench would be utilized for material storage and other mine facilities. The third bench would be the raw coal stockpile bench where three stacking tubes and a reclaim tunnel would handle the raw coal from the mine. The fourth bench would be the coal preparation plant bench. The fifth bench would be the clean coal stockpile bench where three stacking tubes and a reclaim tunnel would handle the washed coal from the preparation plant.

2.11.6 Associated Surface Facilities

Surface

A number of surface facilities are proposed to support the mining operation, including but not limited to a ventilation fan, office, shop, package sewage treatment plant, and raw coal stockpile (see Figures 2-12 through 2-16). These facilities would be located on the existing and proposed coal leases. It is also proposed to locate surface facilities on unleased BLM-managed lands for which a ROW permit would be required. Surface facilities associated with the mine include:

- Coal Preparation Plant – The coal preparation plant would be a structural steel building where coal and rock are separated with heavy media circuits. The structure would be approximately 55 feet by 70 feet by 80 feet high. Facilities associated with the coal preparation plant include a thickener and motor control center.
- Motor Control Center – The motor control center room controls the conveyor motors and would be approximately 10 feet by 12 feet by 12 feet high.
- Thickener – The thickener would be a concrete structure where water is cleaned and returned to the preparation plant. The tank would be approximately 70 feet in diameter and 10 feet high. The reinforced concrete walls and floor would be approximately 10 inches thick.
- Conveyors – There would be fourteen separate conveyors associated with the mine. Conveyors would transport raw coal, waste rock, and clean coal throughout the facility.

- Conveyor Transfer Buildings – Conveyor transfer buildings are structural steel buildings where the beltline from the raw coal stockpile has angle points and therefore needs to change direction.
    - The portal conveyor transfer building would be a structural steel building where the main conveyor belt from the mine terminates. The coal from the mine will transfer to the stockpile conveyor. Waste rock conveyed from the mine will be transferred to the waste rock belt. The dimensions of the building would be approximately 22 feet by 26 feet by 45 feet high.
    - There would be four transfer buildings between the raw coal stockpile and the coal preparation plant. The dimensions of these buildings would be approximately 16 feet by 16 feet by 25 feet high.
    - There would be two additional transfer buildings near the preparation plant for clean coal and for waste rock.
- Raw Coal Stockpile – The raw coal stockpile would contain up to 300,000 tons of raw coal.
- Stacking Tubes – The raw coal would be stacked by up to three concrete tubes each to minimize coal segregation and air particulate emissions. The tubes would be approximately 100 feet high and 12 feet in diameter.
- Reclaim Tunnel – A reclaim tunnel would be located under the stacking tubes and raw coal stockpile. It would be constructed of reinforced concrete. The inside dimensions of the tunnel would be approximately 13 feet high by 12 feet wide by approximately 430 feet long. A 42-inch diameter escape tube would be located on the northeast end of the tunnel. The 150-foot-long escape tube would terminate at a concrete fan housing that would be approximately 6 feet by 6 feet by 8 feet high.
- Washbay – The washbay would be a pre-engineered metal building used to clean equipment. The building would be approximately 50 feet by 25 feet with 24-foot eave heights.
- Unit Train Loadout – Facilities associated with the unit train loadout would include the rail, access road, batch weigh system, and conveyor.
- Loadout Structure/Batch Weigh System – The loadout structure would consist of a structural steel building where the loadout conveyor terminates. The coal would be batch weighed and loaded into rail cars at this location. The dimensions of the building are approximately 30 feet by 40 feet by 120 feet high.
- Water Tank – A water tank would be a fabricated steel tank constructed on an oiled sand base. The tank would be approximately 52 feet in diameter and 32 feet high with a capacity of approximately 500,000 gallons.
- Water Treatment Building – The water treatment building would be located near the water tank. It would be approximately 14 feet by 20 feet with a 12-foot eave height.
- Sewage Treatment Plant – The package sewage treatment plant would utilize settling tanks, chlorine treatment, and an active aeration system. Any sludge generated would be hauled off site and disposed of in accordance with local and state ordinances. Treated water would be discharged to a sedimentation pond and eventually into surface drainage. The building would be approximately 30 feet by 30 feet with a 10-foot eave height.

- Shop – The shop would be a pre-engineered metal building to store supplies and to repair and fabricate equipment. The building would be approximately 100 feet by 50 feet with a 24-foot eave height.
- Bath House/Office – The bath house and office would be a two story pre-engineered metal building of approximately 150 feet by 50 feet with a 24-foot eave height. There would be a paved parking area at the office encompassing 0.8 acre.
- Retaining Wall – The 8-foot-high retaining wall would be approximately 850 feet long. This retaining wall would elevate the immediate portal area above the general portal level and provide a landing area for rock fall.
- Refuse Bin – The refuse (waste rock) bin would be utilized to hold surges in refuse production from the coal preparation plant and will load waste rock haul trucks. The refuse bin would be constructed of structural steel and is approximately 20 feet by 20 feet by 60 feet high.
- Rock Bins – Rock bins would be located at the mine portal. The bins would consist of a concrete base of 20 feet by 30 feet and back wall and separation walls are 90 feet long and 8 feet high.
- Mine Vent Fan – A mine ventilation fan and steel duct work would be located at the return entry of the mine portal. The ventilation fan would be approximately 8 feet in diameter.
- Substation – A gravel surfaced fenced area located near the preparation plant would contain the substation for the mine facilities. The outside dimensions of the facility are 100 feet by 120 feet. The substation would contain transformers to reduce the primary line power to a suitable voltage.
- Transmission Line – A high-voltage overhead transmission line would extend from the substation to the preparation plant and portal level.
- Warehouse – The warehouse would be a pre-engineered metal building for materials storage. This building would be approximately 50 feet by 60 feet with a 24-foot eave height.
- Material Storage – Open areas would be reserved to store materials. Materials to be stored include roof bolts, roof pans, timbers, caps, wedges, hoses, pipe, pipe supplies, electrical equipment, electrical cable, electrical supplies, conveyor belt, conveyor components, motors, gear boxes, mine equipment, mine equipment components, surface equipment, surface equipment components, and rock dust.
- Covered Storage – Two three-sided, pre-engineered metal buildings would be used for storage. One would be approximately 30 feet by 80 feet with a 20-foot eave height and the other would be 30 feet by 100 feet with a 20-foot eave height.
- Non-Coal Waste Storage – Non-coal waste would be stored at various locations in commercially available dumpsters.
- Rock Dust Storage Area – The rock dust would be contained in a silo approximately 50 feet high and 8 feet in diameter. The cinderblock building under the silo would contain a rock dust pod and a distribution compressor approximately 30 feet by 20 feet by 8 feet.

- Fuel Oil Storage/Fueling Station – The fueling station would be a concrete and steel structure containing gas, fuel, and oil. The structure would be approximately 20 feet by 30 feet long. The facility would contain 10,000 gallon diesel tank, a 500 gallon DOT diesel tank, a 10,000 gallon hydraulic oil tank, a 500-gallon antifreeze tank, a 2,000-gallon gear oil tank, a 2,500-gallon gas tank and a 1,000-gallon motor oil tank. The containment area would be constructed of 6-inch-thick, 4-foot-high walls.
- Waste Rock Pile – A waste rock pile would be constructed southwest of the mine portals. The disturbance associated with the waste rock pile would include clearing the area necessary to form the boundary of the pile. Facilities associated with the waste rock pile include a topsoil stockpile, cover fill stockpile, conveyor, haul road, and a sediment pond.
- Temporary Waste Rock Pile – Waste rock would be periodically transported from the underground workings on the mine conveyors. At the portal transfer building, waste rock would be transferred to the waste rock conveyor. The waste rock would be stacked in a temporary waste rock pile located near the transfer building. The waste rock would then be transported to the permanent waste rock disposal area. Up to 1,500 tons may be stored in the temporary waste rock pile at one time.
- Sediment Ponds – There would be eight sediment ponds constructed for the mine facilities named sediment ponds A through H. The sediment ponds would be capable of containing the run-off from a 10-year event with a spillway system designed to handle the peak flow generated by a 25-year storm event. Dewatering of the sediment ponds would be by either a centrifugal pump or a primary spillway pipe with a normally closed valve.

Coal Operations

Coal operations are depicted in Figure 2-17, Coal Operations Sequence. The coal would be transported from within the mine via a portal conveyor. The portal conveyor is an extension of the conveyor from within the mine. It would be 72 inches wide and extend from the portal to the portal transfer building. A 48-inch-wide non-coal waste rock belt would convey waste rock from the portal transfer building to a temporary waste rock pile. A 72-inch-wide stockpile conveyor would then transfer coal from the portal transfer tower to the stacking tube and raw coal stockpile. A reclaim conveyor would transfer coal from the coal stockpile to the coal preparation plant. A 48-inch-wide clean coal belt would deliver the coal to the stacking tubes and clean coal loadout stockpile. A 72-inch-wide loadout belt would feed coal to the unit train loadout. A 48-inch-wide waste rock belt would send waste rock to the waste rock bin and waste rock pile.

The portal transfer building would be a structural steel building approximately 20 feet by 24 feet by 45 feet high, where the main belt from the mine terminates. The coal from the mine would be transferred via a stockpile conveyor. Waste rock from the mine would be transferred onto the waste rock belt.

Coal would be stored in one of two open stockpiles: run-of-mine or clean coal. There will be two potential streams of coal that will make up the clean coal pile. They are coal that has been washed through the preparation plant and raw coal that has bypassed the preparation plant. Typically the quality of the coal is measured by percent ash which translates into heating value. The higher the ash, the lower the heating value of the coal. The preparation plant can be adjusted to produce different qualities of coal. The clean coal stockpile can therefore have two or more

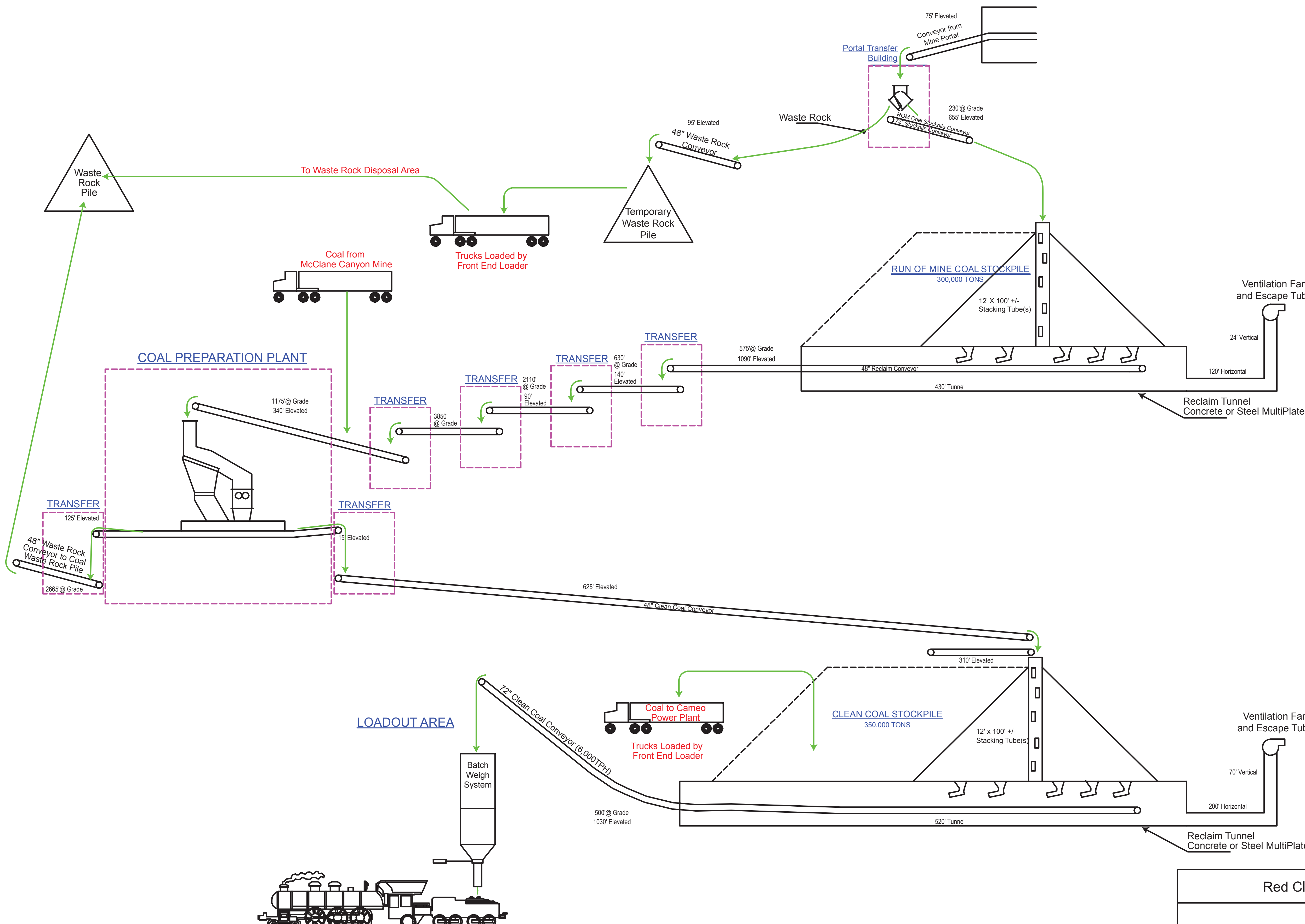

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Figure 2-17
Coal Operations Sequence

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areas with differing ash values. Coal can be loaded out of the clean coal stockpile from an area with high, medium, or low ash or any combination required to meet the customer requirements. In rare instances the coal may have high sulfur which can also be blended with lower sulfur coal to meet quality requirements.

Up to 300,000 tons of mixed coal and rock would be stored in the run-of-mine pile; located within the coal lease boundary. The clean coal stockpile would be located near the unit train loadout. Up to 350,000 tons of coal would be stored in the clean coal stockpile. Stacking tubes would also be used to transfer coal into stockpiles, to minimize coal size segregation and air particulate emissions. Stacking tubes would be 80 to 100 feet high and 10 to 12 feet in diameter. They have numerous, evenly spaced 4-foot-square openings to allow coal to flow from the tube to the stockpiles.

Public use of the existing portions of CR X east of SH 139 will not be restricted, except during road construction and maintenance. Haul trucks will continue to haul coal to the Cameo Power plant as long as it remains in operation.

Coal from the run-of-mine stockpile would be transferred to the coal preparation, or coal wash, plant. The preparation plant would be a structural steel building where coal and rock are separated by gravity with heavy media circuits. The coal is lighter and “floats,” and is then transferred to the clean coal stockpile. The waste rock is heavier and sinks, and is then taken to the waste rock pile. The plant would be a closed system. All water would be treated in a thickener and returned to the plant. No water would be discharged. The thickener is a concrete structure where water is cleaned and returned to the preparation plant. The tank would be approximately 70 feet in diameter and 10 feet high. The coal preparation plant structure would be approximately 55 feet by 140 feet by 80 feet high. A waste rock (refuse) bin may be utilized to hold surges in waste rock production from the coal preparation plant and would load waste rock haul trucks. The waste rock bin would be constructed of structural steel approximately 20 feet long by 20 feet wide by 60 feet high.

From the coal preparation plant, clean coal would be taken to the clean coal stockpile for transfer onto the unit train loadout. Waste rock would be taken to the waste rock pile. Waste rock is generated by the coal preparation plant and by roof falls in the underground mine; it is composed of sandstone and shale, with small amounts of coal. This material has been tested and is not classified as hazardous material. The waste rock material would be hauled by conveyor and truck to the disposal area. Waste rock would be placed and compacted to 90 percent of the maximum dry density to prevent spontaneous combustion and to provide the strength required for stability of the waste rock pile. Dry densities would be determined in accordance with American Association of State Highway and Transportation Officials (AASHTO) Specification T99-74 (AASHTO 1974). The waste rock pile is designed to prevent off-site migration of the waste rock. The placing and spreading of the waste rock would be started at the lowest point of the foundation. The waste rock would be keyed into the natural ground. Materials would be spread in approximately horizontal lifts no more than 24 inches thick and such lifts made uniformly over long stretches. Each lift would be moistened or dried to uniform moisture content suitable for maximum compaction. Compaction would be carried to the edge of the fills so that the final slopes would be firm. Slopes would be no steeper than 2.5H:1V with 15-foot-wide terraces on 50-foot vertical intervals. Runoff from the waste rock pile would be captured and routed to the sedimentation ponds.

As discussed previously, clean coal from the stockpile would be transferred to the unit train loadout. The unit train loadout would be comprised of a reclaim tunnel, conveyor belt(s), and loadout tower. The reclaim tunnel would be located under the clean coal storage pile. It would be constructed of reinforced concrete or steel multi-plate. The typical inside dimensions of a reclaim tunnel are 13 feet high by 12 feet wide. Vibratory feeders in the reclaim tunnel transfer clean coal onto the conveyor belt(s) at a rate of 6,000 tons per hour. Coal would be conveyed directly to the loadout structure. The coal would then be batch weighed and loaded into rail cars at this location. The dimensions of the loadout structure would be approximately 30 feet long by 40 feet wide by 120 feet high.

Construction

Surfacing a mine access road is a trucking-intensive task. It is estimated this work would be performed over a two-month period toward the end of the construction project, as shown in Table 2-10, Mine Access Road Material, and Table 2-11, Mine Access Road Surfacing.

Table 2-10
MINE ACCESS ROAD MATERIAL

Item	Loads	Equipment	Horsepower*
Gravel – 80,000 tons	3,200	Gravel trucks	400
Asphalt – 25,000 tons	1,000	Asphalt trucks	400
Total	4,200		
Average over 2 months (Loads per day)	100		

Note:
*For each piece of equipment.

Table 2-11
MINE ACCESS ROAD SURFACING

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Motor Grader	2	1	20	180
Compactor	1	1	10	310
Water Truck	1	1	10	400

Note:
*For each piece of equipment.

The facilities associated with the proposed mine would be constructed on benches. Benches are carved out of the steep terrain to provide relatively flat surfaces for the mine facilities. Most benches are constructed by excavating the steep slopes and filling ephemeral drainages. The first or upper bench is a utility bench for the water tank. The second or portal bench is developed for a shop, warehouse, raw coal stockpile, reclaim tunnel, and other facilities. The third or material bench is for material storage and parking. The fourth is the office/bathhouse bench. There will also be a coal preparation plant bench and unit train loadout bench.

Construction of the associated facilities would be the most labor-intensive part of the project. It is estimated the structure crew would be on-site for six to nine months to complete all of the mine structures (see Table 2-12, Mine Structures).

Table 2-12
MINE STRUCTURES

Item	Number	Shifts/Day	Hours/Day	Horsepower*
Crane	3	1	30	200
Front-end Wheel Loader	2	1	20	200
Fork Lift	2	1	20	100
Concrete/Gravel Trucks	8	0.3	24	400
Delivery Trucks	4	0.3	12	350
Laborers	50	1	500	N/A
Supervisor/Pickup	3	1	30	N/A

Notes:
*For each piece of equipment.
N/A = not applicable

Construction Impacts – Avoidance and Mitigation

All gravel roads would be watered or treated with a surface surfactant to control potential fugitive air emissions. Water for dust suppression and compaction would be obtained from Mack Wash. A temporary pipeline would be installed along the rail route to provide necessary water for construction activities. Conveyor transfer points would be partially enclosed, and water sprays would be utilized. Stacking tubes would be utilized to reduce the drop height of the coal. Coal stockpiles would be watered as necessary to minimize fugitive dust.

Surface water runoff from the majority of the area, including all of the mine facilities and the rail loadout loop but not including the rail line, would be collected in sediment ponds. Sediment ponds are designed to provide adequate capacity to contain or treat the runoff or inflow entering the pond as a result of a 10-year, 24-hour precipitation event and any additional storage resulting from inflow from the underground mine. Sediment ponds and diversion and collection ditches would be constructed on and off the coal lease boundary. Eight sediment ponds have been designed in various locations within the proposed facilities (Figures 2-12 to 2-16). Ditches have been designed to direct disturbed area runoff to the sediment ponds and, in some cases, divert undisturbed area runoff away from the sediment ponds. Sediment ponds and ditches would be constructed on the coal lease boundary to collect and treat disturbed area runoff.

Surface runoff not collected in a sediment pond would be filtered through a sediment trap such as a silt fence or straw bales. Mine water discharge (groundwater) may mix with surface water. Surface infiltration around coal stockpiles or waste rock piles may allow mixing of surface and groundwater. CAM will be required to obtain a Storm Water Discharge Permit and a National Pollutant Discharge Elimination System (NPDES) permit from the State of Colorado (see Table 1-1, List of Permits and Approvals).

The time of year that construction would commence depends upon obtaining BLM land use and ROW permits, along with other state and federal permits. To estimate the required labor force necessary for the project, construction was broken down into two phases. The first phase includes the heavy earthwork-moving phase; the second phase includes the structure and installation. Phase I requires approximately 90 employees, and Phase II requires approximately 100 employees. There would be some overlap between the two phases, so it is estimated there would be up to 150 employees working on the project at any one time. Phase I is estimated to take approximately six months; Phase II would require nine months, for an estimated total construction time of 12 to 15 months.

2.11.7 Grade-Separated Crossing of County Road M.8

This alternative would include construction of a bridge over the rail route and a new roadway bridge over Mack Wash (Figure 2-4, County Road M.8 Realignment). Crossing the rail line would require raising the grade of CR M.8 a maximum of 35 feet above the existing grade. The clearance over the railroad for the potential CR M.8 overpass must be 22 feet, 6 inches minimum with 23' feet, 6 inches preferred. The overpass would be at a maximum 4 percent grade. Due to the short distance between the rail line crossing and Mack Wash (400 feet), the grade at the wash crossing would also have to be raised, requiring a new bridge or concrete box in this location as well. Approximately 175,000 cubic yards of fill would be required for this alternative, as well as a wider footprint to accommodate the raised grade.

The potential blockage of CR M.8 is the basis for the potential grade separation. CR M.8 is identified as an arterial in the Mesa County 2006 Rural Road Classification and is the major transportation arterial through this area. Temporary closure of CR M.8 by a train on an at-grade crossing could result in significant reduction of access to areas west of CR M.8. There are no alternatives to CR M.8 for traveling west until I-70's Westwater interchange 17 miles to the west.

When CR M.8 is blocked due to the train crossing, emergency vehicles would have to travel north to the CR 10 crossing in order to cross the tracks. The Mesa County Sheriff's Department calculated the emergency response time at 11.5 minutes to travel the alternate route. If CR M.8 is grade-separated, emergency vehicles will not need to detour.

2.11.8 Noiseless Crossings

This alternative would consist of constructing special at-grade railroad crossings of CR M.8 and CR 10. Construction of these noiseless crossings means that the train would not be required to sound a horn in normal operating conditions. A noiseless crossing is actually a quiet zone established per 49 CFR Part 222, the Federal Railroad Administration (FRA) Train Horn Rule. There are two ways to establish a quiet zone with Supplemental Safety Measures (SSMs). FRA needs to be notified (they do not have to approve the application) of these quiet zones; FRA will not re-visit the quiet zone to monitor compliance. The Colorado Public Utilities Commission (PUC) must grant the change to the crossings in a quiet zone. The quiet zone may have only one crossing (as in this case), but the crossing must be at least 0.5 mile in length. The crossing equipment must also include constant warning time (detects train speed and lowers the gate arms so that 20 seconds of gate down time exists before the train enters the crossing), power out indicator, and a lighted "X" sign to indicate to the train that the crossing is a quiet zone crossing. The noiseless crossing could include both CR 10 and CR M.8, or just CR 10 if the CR M.8 grade-separated crossing alternative is selected.

The two methods for SSMs are:

- Standard crossing gate system with a median barrier (at least 6-inch-high curbs) extending at least 100 feet on each side of the crossing.

- Four-quadrant gates with standard railroad gate system but with four gate arms. Two of the gate arms operate in the standard manner. The two additional gate arms are lowered a few seconds after the usual gate arm to prevent trapping a car between the gates.

The first method is preferred, as it has proved to be a safer alternative. The crossing gates do not activate earlier for a quiet zone. The gates must be in the down position for at least 20 seconds before a train occupies the crossing. The far side gates do lower a few seconds after the near side gates in order to preclude cars from being trapped between gates.

With the four-quadrant gate configuration, motorists are still able to drive around the first gates in an attempt to beat the delayed second arm before it gets all the way down. The regulations also allow the train crew to sound the horn in a quiet zone in an emergency. The train crew is responsible for determining what constitutes an emergency. Problem drivers, trespassers, and animals (any animal) are examples of emergency situations.

2.11.9 Transmission Line Alternatives

Three alternatives have been developed in response to potential environmental, access, and land ownership issues. These alternatives are shown on Figure 2-18, Transmission Line Alternatives. All alternatives share the same termini; beginning at the Xcel Uintah substation and ending at the proposed substation. Alternatives A and B share a common route from the Uintah substation along CR 15, CR M, and CR 16 to just north of the Highline Canal; and along the existing pipeline/transmission line in Sections 15, 16, 22, 23, and 26, T8S, R102W. Alternative C shares a route with the Proposed Action from the substation along CR 15, CR M, and CR 14 to just north of the Highline Canal. All land south of the Highline Canal is private, but the transmission line would be constructed in existing utilities easements. North of the Highline Canal, land status is mixed BLM and private; the only easements are along the existing transmission line and pipeline referenced previously.

Table 2-13, Transmission Line Lengths and Land Status Crossed, compares total length of the alternatives and Proposed Action and the private versus BLM-managed lands crossed north of the Highline Canal. When the alternative is located along a property line between private and BLM-managed lands, it is assumed that the line would be constructed on BLM lands. The numbers of private parcels are also shown for alternatives A and B, as ROW negotiations with each landowner would be necessary for these lines.

Table 2-13
TRANSMISSION LINE LENGTHS AND LAND STATUS CROSSED

Alternative	Total Length (miles) Uintah Substation to Mine	BLM*	Private*	Number of Private Parcels*
Proposed Action	14.3	7.1	0	0
Alternative A	15.1	4.1	4.2	19
Alternative B	14.6	5.8	1.9	5
Alternative C	14.9	7.7	0	0

Notes:
* North of Highline Canal only
BLM = U.S. Bureau of Land Management

Alternative A follows CR 16 from north of the Highline Canal to the existing transmission line/pipeline easement in Section 26. This provides easy access but requires additional angle (turning) structures. Mesa County does not have access easements along CR 16 north of the Highline Canal.

Alternative B follows section and property lines to minimize private land crossings. Access would be more overland but would follow some existing disturbance and access roads. The line would be harder to access in inclement weather. The alternative crosses three BLM isolated parcels of land; that is, BLM-managed lands surrounded by private land.

Alternative C from the Highline Canal, this alternative crosses BLM lands to connect with the proposed rail corridor approximately 1,500 feet east of SH 139. This alternative avoids private lands and consolidates railroad, water pipeline, and transmission line disturbance and access for approximately 3.4 miles. Access between the Highline Canal and the rail corridor would be a mix of existing roads/two-tracks and overland travel.

2.11.10 Summary of Alternatives

Table 2-14, Alternatives Examined in Detail, summarizes the action alternatives by project component that will be examined in detail in this DEIS. The No Build alternative will be examined as a baseline case.

The "Proposed Actions with modifications" could be separated into two or more alternatives. However, because these modifications reduce environmental impacts and CAM has adopted them as their Proposed Actions, there is no reason to further examine the originally proposed rail route/configuration or waste rock pile.

Table 2-14
ALTERNATIVES EXAMINED IN DETAIL

Project Components	Alternatives Examined in Detail
Means of transporting coal	Proposed Action

Coal transportation routes and delivery locations	• Proposed Action with modifications
	  • CR M.8 grade separation*
	  • Noiseless crossings*

Electrical power transmission	• Proposed Action
	  • Alternative A
	  • Alternative B
	  • Alternative C

Sources and routes of water supply	Proposed Action
Means/locations of waste rock disposal	Proposed Action with modifications
Coal lease area	Proposed BLM Action (modification of lease area from 11,660 acres to 14,466 acres)
Methane venting	Proposed Action (including adaptive management strategy)

Notes:
* = Alternatives that do not affect BLM-managed lands.
BLM = U.S. Bureau of Land Management
CR = County Road

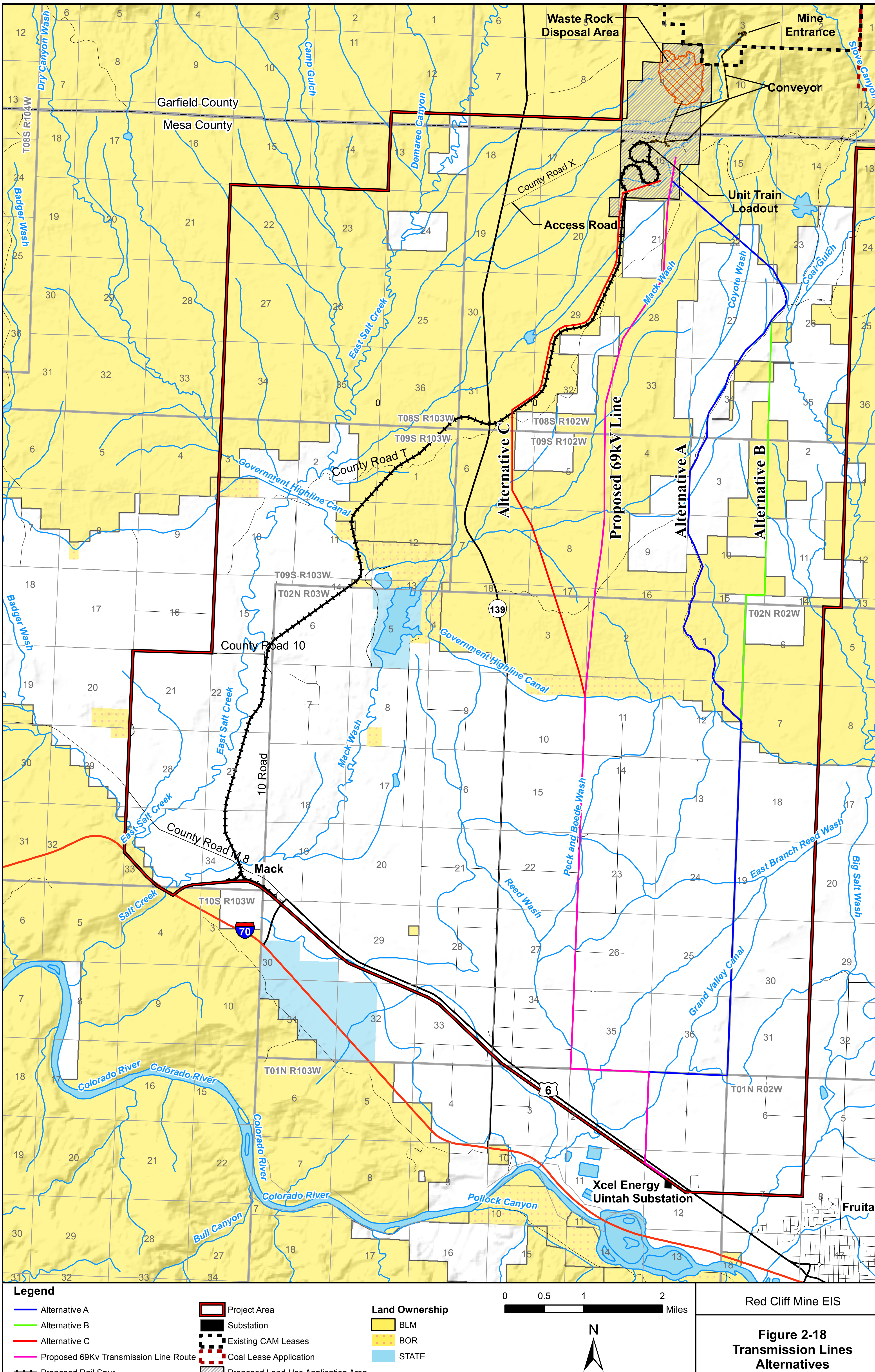

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Figure 2-18
Transmission Lines
Alternatives

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2.12 NO ACTION ALTERNATIVE

Under the No Action Alternative, BLM would not grant ROW easements to CAM or GVP and would not issue the LBA. CAM could continue to mine coal from the MCM and haul the coal by truck to the Cameo Power plant as long as it is in operation. (Note: Xcel Energy has announced that it will be shutting down the Cameo Power plant – no schedule has been released.)

If the No Action Alternative is selected, production of the 8,000,000 tpy of clean coal, with the resulting increased local, state, and federal revenues, would be foregone, and the environmental impacts described in Chapter 4, Environmental Consequences and Mitigation, would not occur.

The No Action Alternative must be considered pursuant to CEQ requirements, to provide a baseline for comparison with the other alternatives.