

## **CHAPTER 2. PROPOSED ACTION AND ALTERNATIVES**

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## CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

### 2.1 Introduction

NEPA requires the consideration and evaluation of a practical range of reasonable alternatives that meet the federal action's purpose and need while minimizing or avoiding environmental impacts. A practical range of reasonable alternatives is formulated to address issues and concerns raised by the public and agencies during scoping. The alternatives represent other means (methods, processes, locations, times, sequences, etc.), besides the Proposed Action, of satisfying the stated purpose and need for the federal action. Reasonable alternatives are defined by the Council on Environmental Quality (CEQ) as those that are technically, economically, and environmentally practical and feasible. NEPA also requires the evaluation of a No Action Alternative. If unreasonable alternatives or alternatives that do not meet purpose and need are suggested, a detailed analysis of these alternatives is not required. However, the rationale for eliminating them from detailed analysis must be explained.

In this EIS, four alternatives are analyzed in detail: Alternative B (Proposed Action Alternative), Alternative C (Reduced Tract Acreage and Seasonal Restrictions), Alternative K1 (Reduced Tract Acreage), and Alternative A (No Action). Several other alternatives were identified and considered but were eliminated from detailed analysis. These alternatives are described in Section 2.7 along with the rationale for eliminating them from detailed analysis. Alternative K1 was eliminated from detailed analysis in the DEIS. However, as a result of public comments received on the DEIS, Alternative K1 is analyzed in detail in this SDEIS.

Department of Interior regulations (43 CFR 46.425) suggest that departmental agencies should identify preferred alternatives in draft EISs, but they do not require them to do so. The BLM did not identify a preferred alternative or preferred alternatives in the Alton Coal Tract LBA DEIS published in November 2011, because no such preference existed at that time. That continues to be the case now. In developing this SDEIS, the BLM has conducted extensive consultation and coordination activities with its cooperating agencies and other agencies with special expertise (see Section 1.3 and Chapter 5). The BLM has also expanded the range of alternatives analyzed in detail, with the inclusion of Alternative K1 for detailed analysis.

As explained in Chapter 1, the BLM has determined that although the tract is unsuitable under Unsuitability Criterion 15, the BLM can nevertheless continue to consider the tract for leasing because, as stated under Criterion 15, “[a] lease may be issued if, after consultation with the state, the surface management agency determines that certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected.” A number of measures intended to address the potential impacts of the alternatives on sage-grouse are included in the analysis in this SDEIS. These measures would apply to the tract under any action alternative. The BLM has opted not to select a preferred alternative at this time because it is interested in receiving additional agency and public input on this analysis and on the efficacy of those measures relative to the impacts of leasing and mining the tract under the action alternatives. The BLM will identify its preferred alternative in the FEIS after all comments received on this SDEIS are considered.

LBA tracts are nominated for leasing by companies with an interest in acquiring a lease. As described in Chapter 1, the LBA process is, by law and regulation, an open, public, competitive sealed-bid process. If the Alton Coal Tract LBA is offered for lease, the applicant for that tract may or may not be the highest bidder when the lease sale is held, and therefore may not be the successful bidder. Further, if a decision is made to hold a competitive lease sale and a lease is issued, the lessee must obtain mine plan approval and a permit to conduct coal mining operations, including a detailed mining and reclamation plan (MRP), before mining can begin on the tract. A detailed MRP is not developed at the time the BLM processes an LBA

primarily because of the uncertainty regarding who the successful lessee might be in the event the tract is leased. As discussed in Chapter 1, the MRP and overall PAP would be developed and would undergo a detailed review by state and federal agencies as part of the approval process to mine, which occurs after the tract is leased. The approval of a PAP requires that reclamation be completed such that the post-mining land use achieves a higher and better use requirement (30 CFR 715.13). The detailed MRP of any successful bidder, the applicant or otherwise, would be required to conform to the stipulations and conditions attached to the lease through the land use plan and to conform to the decisions following this EIS. The conceptual MRPs described in this EIS for the Proposed Action, Alternative C, and Alternative K1 are not final plans, but represent reasonably foreseeable development (RFD) for use in analyzing the potential environmental consequences of issuing a lease for the tract.

The Alton Coal Tract is in Kane County, Utah, approximately 0.10 mile south of the town of Alton and 2.9 miles east of US-89. A map of the tract in relation to surrounding towns, highways, existing and potential fee coal areas, and other area landmarks is presented in Map 1.1. Under the Proposed Action, Alternative C, and Alternative K1, tract configurations contain a mix of federal surface and mineral estate and split estate (private surface and federal minerals) lands. Private surface owners with lands included in the tract under either tract configuration may meet the requirements listed under 43 CFR 3400.0-5(gg)(1), (2), and (3) to be qualified surface owners<sup>1</sup> and are therefore considered to be legally qualified to give consent to mine federal minerals under their private estates. A final determination of surface-owner status and qualified surface-owner consultation would occur after issuance of the ROD, but prior to leasing, if the tract is offered for leasing. In the event that one or more of the qualified surface owners would not consent to leasing, the related land (or lands) would be removed from the tract prior to holding a lease sale. However, based on patent records (available through the BLM Utah State Office), some surface owners may not have the authority, based on the congressional act<sup>2</sup> under which land was transferred from federal to private ownership, to refuse access to their private surface for purposes of coal mining. A final determination of surface-owner rights to refuse access to coal resources under their private surface estates would occur after a ROD is issued, but prior to leasing, if the tract is offered for leasing. For purposes of the EIS analysis it is assumed that, in the event of a lease sale, all private surface estates under which coal deposits are present would be mined.

As indicated in Chapter 1, some of the coal reserves in the tract under the Proposed Action, Alternative C, and Alternative K1 are not currently considered recoverable because KFO Route 116 traverses the proposed tract. Under SMCRA, the approval of surface-mining operations on lands within 100 feet of the outside line of the ROW for a public road requires a process resulting in a final decision by DOGM or the public road authority (43 CFR 3461; Unsuitability Criterion Number 3). As discussed in Chapter 1, Section 1.7.1.2.2, the coal underlying KFO Route 116 and underlying a buffer zone extending 100 feet on either side of the outer edges of the road is currently considered unsuitable for mining. However, if the decision is to offer the tract for competitive leasing, the successful bidder would be responsible for any road relocation, as required for mining of the tract. The successful bidder, Kane County, and the BLM would work on a plan that conforms to DOGM's responsibility and leasing criteria to relocate KFO Route

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<sup>1</sup> Under the regulations under 43 CFR 3400.0-5(gg)(1), (2), and (3) qualified surface owner means the natural person or persons (or corporation, the majority stock of which is held by a person or persons otherwise meeting the requirements of this section) who: 1) hold legal or equitable title to the surface of split estate lands; 2) have their principal place of residence on the land, or personally conduct farming or ranching operations upon a farm or ranch unit to be affected by surface-mining operations; or receive directly a significant portion of their income, if any, from such farming and ranching operations; and 3) have met the above conditions for a period of at least three years, except for persons who gave written consent less than three years after they met the above requirements. In computing the three year period the authorized officer shall include periods during which title was owned by a relative of such person by blood or marriage if, during such periods, the relative would have met the requirements of this section. A qualified private surface owner is legally qualified to give consent to mine federal minerals under the private surface owner's estate.

<sup>2</sup> Private surface estates within the tract were originally granted to private surface owners under either 35 Stat., 844 (March 3, 1909), 36 Stat., 583 (June 22, 1910), or 39 Stat., 862 (December 29, 1916).

116 to allow recovery of the coal underlying the road and its buffer zone. The action alternatives assume that an agreement to relocate the road would be reached (KFO Route 116 relocation is discussed under each resource section in Chapter 4). Other roads traversing private land and BLM-administered land are also present on the tract. The EIS analysis assumes that these roads would be closed for the duration of active mining operations and that they would be replaced following completion of successful mining and reclamation activities. The successful lessee would be responsible for reestablishment of these roads based on private landowner and BLM direction at the time of final reclamation. Temporary roads, which would be reclaimed following mining, may be constructed during active mining operations to allow access as necessary for private landowners and permittees (see Section 2.6.2). The estimated cost to a successful bidder for relocating KFO Route 116 and for replacing roads on private land and BLM-administered land would be considered by the BLM in the fair market value determination for the tract. To be successful, a bidder must pay fair market value for the tract.

The Alton Coal Tract under all action alternative configurations also includes an area where no coal is present due to erosion or past natural coal fires (Powell 2008). This is known as the no-coal zone. Although these lands would not be mined, they are included in each tract configuration to 1) allow maximum economic recovery of all the mineable coal that lies adjacent to the no-coal zone, 2) comply with the coal leasing regulations that do not allow leasing of fewer than 10-acre aliquot parts, 3) provide additional surface acreage deemed by the BLM to be reasonably necessary to conduct mine operations, and 4) allow for habitat enhancement in the tract close to areas that would be mined.

In the analysis, different areas of the tract under each action alternative have been assigned identifiers based on their locations. Block NW is the northwest portion of the tract closest to the town of Alton. Block C is the central portion of the tract that includes the centralized facilities and the area that would be underground mined due to overburden exceeding approximately 200 feet in thickness. The central-west north (Block SWN) and central-west south (Block CWS) portions of the tract, respectively, consist of coal reserves that are essentially disconnected from other portions of the tract. Blocks S and Sa make up the south portion of the tract, with Block Sa being the area of the tract in the no-coal zone where sage-grouse habitat enhancement would be required under any action alternative other than Alternative K1, which does not include Block S or Block Sa (see Table 2.5.1). The approximate boundaries of each of these blocks of the tract are depicted on Map 2.1.

Under the Proposed Action, Alternative C, or Alternative K1, coal would be mined from one coal seam, referred to as the Smirl Coal Zone. The Smirl Coal Zone has an average thickness of 15.3 feet based on 25 cored drill holes over the tract. Coal quality and thickness are both variable over the tract. Some coal quality information is included in Section 3.6 of this document. The Bald Knoll Coal Zone is also present in the tract but is not proposed for mining in the lease application. The quality and quantity of coal in the Bald Knoll Coal Zone in the tract are insufficient to be recoverable.

## 2.2 Alternative A: No Action

Under the No Action Alternative, the application to lease the coal included in the Alton Coal Tract under the Proposed Action, Alternative C, or Alternative K1 would not be approved, the LBA tract would not be offered for competitive lease sale, and the coal included in the LBA tract would not be mined.

Rejection of the application would not affect mining activities on private land adjacent to the tract (i.e., the Coal Hollow Mine). The Coal Hollow Mine consists of approximately 635 acres of land and approximately 5 million short tons of recoverable coal leased from private surface and mineral owners. Average annual coal production is anticipated to be approximately 2 million tons and mining activities are expected to employ approximately 160 persons (100 at the tract and 60 for coal trucking operations); though initial operations and startup would employ much less (approximately 16 employees). Rejection

of the application would also not affect an anticipated permit application from ACD to mine fee coal on private lands adjacent to the tract to the north. These fee coal areas are depicted in relation to the tract under the Proposed Action in Map 1.2, under Alternative C in Map 2.2, and under Alternative K1 in Map 2.3.

To compare the economic and environmental consequences of mining these lands versus not mining them, this EIS was prepared under the assumption that the tract would not be mined in the near future if the No Action Alternative is selected. Under the No Action Alternative, the public lands in the tract would continue to be managed in accordance with the KFO RMP (BLM 2008b). The area would be managed for livestock grazing, recreation (primarily hunting and off-highway vehicle [OHV] use), and wildlife habitat. Vegetation treatments (wildlife habitat treatments, watershed treatments, livestock rangeland treatments, wildland fire use, fuels treatments, and stewardship contracting) would occur in support of the BLM's Healthy Lands Initiative. Private lands in the tract would continue to be used for livestock grazing, farming, and dispersed recreation (especially hunting).

Selection of the No Action Alternative would not preclude leasing and mining of this tract sometime in the future. To consider leasing and mining this tract in the future, another LBA would have to be submitted and another NEPA process would need to be conducted.

## **2.3 Alternative B: Proposed Action**

Under the Proposed Action, the Alton Coal Tract would be offered for lease at a sealed-bid, competitive lease sale, subject to lease stipulations developed for the tract. The boundaries of the tract would be reasonably consistent with the tract reconfiguration completed by the BLM after ACD's original LBA submittal (see Map 1.2).

### **2.3.1 Location and Overview**

The tract under the Proposed Action encompasses approximately 3,576 acres<sup>3</sup>, of which approximately 2,280 acres are federal surface and mineral estate and 1,296 acres are split estate; private surface estate and federal mineral estate (Map 1.2 depicts private and BLM surface in the tract under the Proposed Action). However, not all surface estates, private or federal, have coal reserves underlying them (Map 1.2 also depicts the approximate extent of the coal line in the tract). The legal description of the tract under the Proposed Action is contained in Table 2.3.1. The land description and acreages are based on the BLM Status of Public Domain Land and Mineral Titles approved Coal Plats as of August 21, 2002, and July 28, 2006.

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<sup>3</sup> The NOI identifies 3,581 acres, more or less, in the tract. However, for reasons described in Table 1.1.1 and Section 3.1.3 (Notes on Data Sources and Tract Acreage), the analysis uses a tract acreage of 3,576 acres.

**Table 2.3.1.** Alton Coal Tract Legal Description and Surface Ownership under the Proposed Action

Legal Description*	Surface Owner†	Acres
<b>Township 39 South, Range 5 West, Salt Lake Meridian, Utah</b>		
Section 7, SE¼SW¼ and S½SE¼	3	122
	5	7
Section 18, lots 3 and 4, E ½, E½W½	BLM	357
	3	42
	16	158
	17	3
Section 19, lots 1 through 4, NE¼, E½W½, N½SE¼, SE¼SE¼	BLM	472
	1a	120
Section 20, lots 4 and 5, N½SW¼	BLM	47
	1a	111
Section 30, lots 2 through 4, SW¼NE¼, SE¼NW¼, E½SW¼, W½SE¼	BLM	338
	1a	13
Section 31, lots 1 through 3, NE¼, E½NW¼, NE¼SW¼, N½SE¼	BLM	471
<b>Township 39 South, Range 6 West, Salt Lake Meridian, Utah</b>		
Section 12, SW¼, W½SE¼	Unknown	9
	3	218
	8	16
Section 13, NW¼NE¼, N½NW¼, SE¼NW¼, SE¼	BLM	160
	3	161
Section 24, NE¼, N½NW¼, SE¼NW¼, E½SW¼, N½SE¼, SE¼SE¼	BLM	159
	11	4
	12	313
Section 25, E½NE¼, SW¼NE¼, SE¼	BLM	276
Error‡		5
<b>Total Private</b>		<b>1,296</b>
<b>Total BLM</b>		<b>2,280</b>
<b>Total LBA</b>		<b>3,581</b>

Note: This table also appears in Chapter 1.

\* Based on the BLM Status of Public Domain Land and Mineral Titles approved Coal Plats as of August 21, 2002 and July 28, 2006.

† Where the BLM is the surface owner of the parcel this is explicitly noted. Private surface owners are numbered rather than identified by name due to privacy concerns.

‡ The acreages above were calculated using ESRI ArcGIS 9.2 and NAD 1983 UTM Zone 12N coordinate system. The BLM shapefile of coal ownership is georeferenced (in NAD 1983 UTM Zone 12N), but is not survey accurate. ACD provided a hardcopy map (with surface ownership and section boundaries), which was scanned and georeferenced to section corners visible on USGS 7.5-minute topographic maps. Polygons were then digitized to encompass/represent each of the legal descriptions above using the BLM shapefile, ACD's georeferenced map, and the USGS 7.5-minute topographic map as references while digitizing. All acreages are approximate and have not been verified by ground surveys. The error is largely a result of the disparate sources for boundary data. Additionally, the ownership lines from the map provided by ACD do not align well in all locales with the BLM boundary. This suggests that one or both of these datasets are approximate and is another potential source of error.

Under the Proposed Action, recoverable portions of in-place coal reserves would be mined over approximately 25 years using 1) surface-mining methods where the depth of overburden would be less than approximately 200 feet, and 2) underground methods (development mining, auger mining, highwall mining, longwall mining, and/or room and pillar mining; see Appendix C) where the depth of overburden would exceed approximately 200 feet. The choice of mining method, however, can vary from the 200-foot overburden threshold depending on the coal thickness, overburden type, overburden (highwall) stability, underground mining techniques available, operating and capital costs, and coal market economics. (The analysis considers surface disturbance for surface mining up to approximately 200 feet of overburden removal.) Approximately 2 million tons of coal per year would be mined once topsoil stockpiling and initial overburden removal have occurred. Reclamation would be concurrent with mining over the course of the estimated 25-year life of the mine and would be followed by a minimum 10-year reclamation and revegetation monitoring period.

BLM independently evaluated the coal resources in the tract. BLM estimates that the tract under the Proposed Action consists of approximately 59.6 million tons of in-place coal and that an estimated 44.9 million tons of coal would be recoverable from the tract. BLM estimates that in areas where coal would be mined by surface-mining methods, approximately 90% of the estimated in-place coal reserves could be recoverable. However, in those portions of the tract that must be mined by underground mining methods, approximately 50% of the in-place coal reserves could be recoverable. These percentage recovery estimates are based on assumptions about the depth to which the use of surface-mining methods is feasible and the extent of the no-coal zone.

### **2.3.2 Preliminary Mine Plan**

This section describes, on a conceptual level, the MRPs that would be used to mine and reclaim lands in the tract under the Proposed Action. The conceptual MRPs described here are not final plans but represent RFD for use in analyzing the potential environmental consequences of issuing a lease for the tract. As described in Section 1.1, the successful lessee would file a PAP with the DOGM and OSM for a surface-mining permit and approval of an actual mining plan after a lease has been issued by the BLM. Analysis of the site-specific permit application and mining plan occurs at this time.

#### **2.3.2.1 MINING METHODS AND MINE FACILITIES<sup>4</sup>**

It is anticipated that approximately 1,993 acres of surface disturbance would occur in the tract under the Proposed Action. Of this, 1,750 acres would be the result of surface-mining operations (pit disturbance). Centralized facilities associated with mining activities on the tract would be located for the life of the mine on approximately 36 acres of BLM-administered land in the tract's no-coal zone (see Map 1.2). These facilities would include an office, maintenance shop, equipment wash bay, oil and fuel storage tanks, oil and fuel storage containment, truck unloading and coal sizing area, coal stockpile area, and truck loadout area. Dispersed facilities necessary to conduct mining operations would include temporary light-use roads and haul roads, electrical poles and lines, various temporary ponds and water-control structures, temporary topsoil and overburden stockpiles, and temporary berms and screens. These facilities would be moved on a regular basis based on the mining sequence and would result in approximately 160 acres of active disturbance. Dispersed facilities would be sited to avoid disturbances to cultural resources, wetlands, floodplains, stream channels, and intact sagebrush stands wherever possible. Where it is not possible to avoid disturbances to these areas, mitigation measures would be prescribed.

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<sup>4</sup> Under the Proposed Action, an EODA may be required, as described in Section 2.4.2.1, if a company other than ACD were the successful bidder. ACD would not require an EODA under the Proposed Action because they have already obtained fee coal leases adjacent to the tract that would allow them to start mining operations on the tract without creating a new pit that is not adjacent to an existing open pit.

SMCRA requires that mine operators “minimize disturbances to the prevailing hydrologic balance at the mine-site and in associated offsite areas and to the quality and quantity of water in surface and ground water systems both during and after surface coal mining operations and during reclamation” (30 USC 1265(b)(10)). DOGM is responsible for ensuring protection of the hydrologic balance when permitting coal mining operations (UAC R645-301-731.100).

At any one time, anticipated active mining operations (including open surface-mining pits from which coal would be removed and areas where topsoil and/or overburden would be removed) would involve approximately 120 acres (one open pit). The depth of an open pit from which coal is being removed would be up to approximately 200 feet, and highwall length would be up to approximately 1,500 feet. An additional approximately 120 acres or more would be in some stage of reclamation (overburden replacement and top-soiling, grading to approved post-mine topography [PMT], or seedbed beginning).

Where the depth of overburden is approximately 200 feet or less, surface-mining methods would be used to mine in-place coal reserves. Topsoil removal with suitable heavy equipment, such as rubber-tired scrapers, would proceed ahead of overburden removal. Topsoil would be salvaged and stored in a protected site until required for reclamation. Whenever possible, direct placement of topsoil in an active reclamation area would be conducted; however, due to scheduling, some topsoil would be stockpiled. Overburden removal would be conducted using equipment such as trucks and shovels. Other equipment used during overburden removal and backfilling would include dozers, scrapers, excavators, front-end loaders, graders, and water trucks. To confine disturbance to the active mine blocks, as overburden is removed, most of it would be directly placed into areas where coal has already been removed. According to DOGM rules and regulations, as part of the PAP for a permit to conduct mining operations, overburden is pre-sampled to verify that it is suitable for reclamation. Material found to be unsuitable for reclamation (i.e., material that is not suitable for use in reestablishing vegetation or that may affect groundwater quality due to high concentrations of certain constituents, such as adverse pH levels) would either be removed and treated, or adequately covered with suitable overburden material prior to grading and top-soiling.

Where the depth of overburden is approximately 200 feet or more, underground mining methods would be used to mine in-place coal reserves. This would account for approximately 613 acres in the northeast section of the tract<sup>5</sup>. For underground mining, the use of methods such as development mining, auger mining, highwall mining, longwall mining, and/or room and pillar mining would be anticipated. For descriptions of these underground mining methods and references for further information, see Appendix C. Following coal removal, trucks would transport coal from the open pit to the centralized facilities for sizing, temporary stockpiling, and eventual placement on trucks for transport to market. This process would likely involve loading unsized coal into a hopper, which would then feed coal into a breaker to reduce the coal to a maximum size and to even the flow of coal to the conveyor belt. The conveyor belt would lead to a crusher that would size coal to the appropriate dimensions for sale and delivery to market. After sizing, coal would be moved to a temporary stockpile (approximately 50,000+ tons would be stockpiled at any one time) via a stacker (an inclined conveyor belt) or system with a similar purpose before being placed on coal trucks via a feeder system. Each truck would carry approximately 42 tons of coal.

### **2.3.2.2 RECLAMATION**

The successful bidder is required to develop a site-specific, detailed reclamation plan as part of the PAP, in consultation with BLM and DOGM. The reclamation plan in the PAP would include specifications for grading the surface to an acceptable PMT, replacement of salvaged topsoil to an acceptable depth over

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<sup>5</sup> Surface-mining operations would be discontinued at an approximate 200 feet maximum of overburden removal, resulting in 613 acres of the tract being mined using underground mining methods. This acreage figure describes the total area within the tract where coal recovery would occur due to underground mining methods. Also see Maps 1.2, 2.2, and 2.3.

suitable overburden, and reestablishment performance criteria for revegetation for the determined post-mining land use.

The reclamation plan describes concurrent reclamation (occurring during operation of the mine) and final site reclamation (upon closure of the facility). The UAC R645-301-553 requires rough backfilling and grading to follow coal removal by not more than 60 days or 1,500 linear feet; although, additional time may be granted if it can be demonstrated in a detailed written analysis that additional time is necessary. Upon approval of the PAP by DOGM, the mine operator would be required to post a reclamation performance bond with the State of Utah for all areas physically disturbed by mining operations. This would ensure that the operator complies with all the reclamation requirements of the DOGM MRP Permit<sup>6</sup> and that all reclamation requirements are met. The reclamation bond could be fully released after a minimum 10-year period (post-completion of permanent reclamation operations) on stable reclaimed land where revegetation standards have been met. DOGM would release the full reclamation performance bond after strict reclamation standards have been met and after the public has been provided an opportunity to comment.

As previously described, approximately 120 acres or more would be in some stage of reclamation (overburden replacement and topsoiling, grading to approved PMT, or reseeding/revegetation). Most replaced overburden would be graded to approximate original contour (AOC), plowed, and finally covered with topsoil (from the topsoil storage areas on-site). In locations where the AOC cannot be achieved, a variation from AOC would be requested in the PAP and would require approval from DOGM and the land management agency or private landowner. Elevations consistent with an approved PMT would be established as soon as reasonably possible. Under certain conditions, the PMT may not be immediately achievable. This would occur if there is an excess of material that may require temporary stockpiling, if there is insufficient material available from current overburden removal operations, or if future operations could redistribute an area previously mined.

Prior to reseeding, compacted areas would typically be plowed or chiseled to loosen compacted soils. Plowing or chiseling promotes water infiltration, soil aeration, and root penetration. This would be done when soils are at an optimum moisture content and are loose and friable, to promote shattering of compacted soils, but to avoid pulverizing the soil into powder. Seedbed preparation would be conducted immediately prior to seeding to prepare a firm seedbed conducive to proper seed placement, to provide for moisture retention, to break up dried and hardened surface soil, and to discourage weeds. It is anticipated that chiseling would be sufficient because it leaves a surface smooth enough to accommodate a tractor-drawn drill seeder but rough enough to catch broadcast seed and trap moisture and runoff. An alternative to the use of chiseling is to spread topsoil using a low ground pressure dozer, which would minimize compaction of the soil, leaving a suitable surface for seeding.

Vegetation would be reestablished with a DOGM-approved seed mix (developed based on input from the BLM, UDWR, or private landowner) that is consistent with the determined post-mining land use. The seed mix used for revegetation on federal land would include a diverse mix of suitable native and non-native perennial grasses, forbs, and shrubs. On these lands, reclamation would most likely require an attempt to reestablish native and non-native vegetation communities suitable for the post-mining land use. Establishment of reclamation species would be designed to support post-mining land use by stabilizing the soil, providing livestock and wildlife forage, and providing thermal, nesting, and parturition cover for wildlife. On private land, revegetation would most likely involve the reestablishment of pre-mining agricultural vegetation in accordance with directives from private landowners and local, state, and federal

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<sup>6</sup> State of Utah coal mine permitting requirements (Coal Mining Rules - UAC R645) are available at <http://www.rules.utah.gov/publicat/code/r645/r645.htm>. They may also be viewed at the main office of the DOGM at 1594 West North Temple, Suite 1210, Salt Lake City, Utah 84114.

regulations, as applicable<sup>7</sup>. In general, reclamation operations would use weed-free seed and equipment, methods that are appropriate for local rainfall and soil conditions, and methods that have been successfully used for revegetation at other, similar mines. On federal land, special consideration of post-mining habitat establishment for sagebrush obligate species would be performed in coordination with DOGM, UDWR, and the BLM.

Fall and spring seeding would occur to take advantage of available moisture. During final reclamation and return of the site to direct federal management (as specified in the approved PAP), the successful bidder would obtain necessary authorizations from the appropriate regulatory agencies for final bond release and to properly reclaim and abandon facilities. In general, reclamation operations would follow BLM, DOGM, and OSM best management practices (BMP) for land use, including reclamation and would be described in detail in the PAP for the successful bidder.

In regard to water resources, SMCRA requires that mine operators “minimize disturbances to the prevailing hydrologic balance at the mine-site and in associated offsite areas and to the quality and quantity of water in surface and ground water systems both during and after surface coal mining operations and during reclamation” (30 USC 1265(b)(10)). DOGM is responsible for ensuring protection of the hydrologic balance when permitting coal mining operations (UAC R645-301-731.100).

### 2.3.2.3 WATER REQUIREMENTS

Assuming approximately 2 million tons of coal production per year, 8.2 million gallons (25 acre-feet) of water per year would be used for dust suppression and equipment washing. Water would be provided from groundwater accumulated in open coal pits as is currently done at the adjacent Coal Hollow Mine, or from a permitted off-site source. ACD currently has rights to 50 acre-feet of groundwater acquired from the Town of Alton. The successful bidder, if other than ACD, would need to negotiate for these or other available groundwater or surface-water rights. ACD has not obtained rights to any surface waters in the watershed. If wells are used, water would most likely be transported by a pump and piping system. To produce an annual volume of 25 acre-feet of water, a well (or network of wells) would be required to pump at a combined rate equivalent to a continuous flow rate of 15.5 gallons per minute. This system would consist of waterlines connected to a storage tank. The system would maintain the water level in the tank that would then be used to load one to three water trucks for use in dust suppression or to supply the underground mine. The pipe length would be shortened, extended, and rerouted as needed to provide water to the active mining area. In addition to this system, water (groundwater) may also be used from the excavated areas when water is available at these locations. The water would be used by installing a pump attached to a stand pipe at the water retention location. The pump and stand pipe would then be used to load the water trucks from the retention area. This system would be used whenever practicable.

Mine dewatering using dewatering wells would likely not be performed in mining operations in the tract area. Mine dewatering using dewatering wells has not been performed at the existing Coal Hollow Mine. The potential for dewatering using pumping wells is limited due to the generally low permeability of the clayey and silty sediments that are pervasive in the shallow groundwater systems in the area (the groundwater production rates from dewatering wells would likely be too low for effective mine dewatering). At the Coal Hollow Mine, some attempts have been made to intercept upgradient alluvial groundwater and divert it away from the mine pit areas using excavated groundwater interception trenches. Such practices could be used in the tract area if appreciable upgradient alluvial groundwater resources are encountered. All water sources would be permitted by the Utah Division of Water Quality and the Utah State Engineer’s Office, as necessary.

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<sup>7</sup> Revegetation would occur in accordance with the approved post-mining land use. Private landowners can change their minds in regard to the post-mining land use, and hence revegetation species and composition, but a DOGM process must be followed for approvals.

### 2.3.2.4 BLASTING

Blasting operations (shooting operations) would be conducted in compliance with DOGM and the Bureau of Alcohol, Tobacco, and Firearms' rules and regulations. In the approved mine plan, a blasting plan would be developed and approved that is sensitive to noise impacts on wildlife, residents of the town of Alton, and points in Bryce Canyon National Park where the analysis shows blasting-related impacts. The blasting plan would be reviewed for comment by the BLM, USFWS, and UDWR prior to approval by the DOGM and prior to any blasting activity. To make the general public aware of blasting operations, the blasting schedule would be published (as blasting requirements are identified) in accordance with DOGM regulations and requirements at UAC R645-301-524, Blasting and Explosives. The blasting schedule would be published in the local and regional newspapers. This notice would also be mailed to the residents of the town of Alton, including any residences located within 0.5 mile of the tract. In accordance with DOGM blasting regulations, at least 30 days prior to blasting, all residents or owners of dwellings or structures within 0.5 mile of the mining area would receive instructions on how to request a pre-blasting survey. Pre-blasting surveys would be conducted as requested and seismographic recordings of blasting operations would be completed. Pre-blasting surveys would determine the condition of dwellings or structures and would document any pre-blasting or existing damage and other physical factors that could reasonably be affected by blasting operations. For surface blasting incident to underground mining and reclamation activities, local government and residents within 0.5 mile of the blasting site would receive notification as required by 30 CFR 817.64; however, pre-blasting surveys would only be required if 5 pounds of explosives (or more) are used (UAC R645-301-524.300).

There would be two basic types of blasts (shots): 1) overburden shots for shovels or other equipment and 2) coal shots. As a safety measure, shots would be designed to minimize flyrock, airblast (noise), ground vibration, emissions of nitrogen oxides (NO<sub>x</sub>), and particulate matter (PM) with PM of 10 micrometers or less (PM<sub>10</sub>), 2.5 micrometers or less (PM<sub>2.5</sub>), or both. The area would also be well marked and monitored prior to and immediately following a shot. Airblast and ground vibration due to blasting operations would be at or below the MSHA's maximum limits and emissions of NO<sub>x</sub>, and PM would be controlled to maintain compliance with NAAQS. Blasting would also be used for underground mining as regulated by the MSHA.

### 2.3.2.5 LIGHTING FOR NIGHTTIME OPERATIONS

Lighting during nighttime operations would likely consist of one to six portable light towers, four to six fixed-position light poles, and equipment lighting. Portable light towers would be diesel powered with four lights (1,000 watts each) per tower. Each portable light tower would be approximately 30 feet tall and would be moved in accordance with the mining sequence. Fixed position light poles would consist of one 250-watt lamp per pole and would be permanently located near the centralized mine facilities. Lamps on portable light towers and fixed-position light poles would be oriented approximately 30 degrees from the horizontal down toward the ground. Equipment lighting would come from head lights, brake lights, and other safety lighting on the heavy equipment used for mining operations. The following is an estimate of ranges for the quantity of equipment that may be used during nighttime operations:

- Shovels or other loaders: 1–2
- Backhoes/front-end loaders: 1–3
- Bulldozers: 2–5
- Haul trucks: 3–10
- Graders: 1–2
- Light vehicles: 2–6
- Mechanic trucks: 1–4
- Fuel trucks: 1–2
- Water trucks: 1–2

In addition, miscellaneous lighting such as interior building lights and flashlights would commonly be used at the site.

### 2.3.2.6 POWER GENERATION

Electrical power generation for mining operations would be supplied through a combination of diesel generators. Fixed position, heavy equipment operations located at the centralized facilities (hopper, feeder breaker, conveyor belt, crusher, stacker, and truck feeder) would require 2–3 megawatts (mW) of power supplied by one generator. An additional generator would likely be required on-site as a backup in the event that prolonged generator maintenance or repair renders another generator temporarily unusable. Additional power (500 kilowatts to 1 mW) would be required for offices, fixed position light poles, maintenance shop, equipment wash bay, etc. One generator would be used to supply this power.

The generator configuration and precise specifications would be determined at the time of permitting and detailed mine planning if the tract is offered for lease. All generators would use ultra-low sulfur diesel fuel (15 parts per million [ppm] of sulfur) and be equipped with EPA Tier 4 emissions controls. Generator mufflers would be construction grade (reducing noise emissions approximately 15 decibels [dB]), residential grade (reducing noise emissions approximately 25 dB), or critical grade (reducing noise emissions approximately 35 dB). Underground mining could require additional generating capacity, but what is analyzed is what is reasonably foreseeable.

Electrical power from existing or upgraded local power systems could be an alternative power source but would be analyzed separately if determined to be pursued. Obtaining power from existing or upgraded local power systems is not considered reasonably foreseeable at this time (see Section 2.7.2.3, Power Generation Options).

### 2.3.2.7 HAZARDOUS MATERIALS AND HAZARDOUS AND SOLID WASTE

Potentially hazardous materials anticipated to be used or produced during the implementation of the Proposed Action fall into the following categories:

- Liquid wastes
- Fuels: gasoline (potentially containing benzene, toluene, xylene, methyl tert-butyl, ether, and tetraethyl lead) and diesel fuel
- Coolants and antifreezes
- Lubricants: grease (potentially containing complex hydrocarbons and lithium compounds) and motor oil
- Paints
- Solvents
- Solid wastes

Solid waste that would be produced at the surface-support facilities and throughout the tract may include floor sweepings, shop rags, lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. Portable toilets would be provided for mine employees near areas of active mining and reclamation. Waste from these would typically be removed by a portable toilet service company according to a regular schedule. Permanent toilet facilities would be located at the surface support facilities. These would involve sealed containment tanks (as opposed to septic systems) pumped as necessary to remove wastes.

Maintenance and major oil changes for most moveable equipment would take place inside the maintenance shop. Used oil would be contained and disposed of or recycled in accordance with guidelines administered by the Utah Department of Environmental Quality's (UDEQ's) Division of Solid and Hazardous Waste. Mobile fuel trucks would be used to service and fuel mine equipment in the tract, as appropriate. All fuel storage facilities and equipment would be constructed and operated in accordance with all applicable state and federal regulations.

All solid and liquid wastes would be contained, stored, and disposed of in accordance with applicable local, state, and federal rules and regulations. Specific containment, storage, and disposal techniques would depend on the type and quantity of waste according to applicable rules and regulations. Typically, nonhazardous solid and liquid waste would be contained on-site in dumpsters and transported periodically to a landfill. Any hazardous solid or liquid wastes would typically be separated and stored in appropriately labeled (according to type of waste) barrels that meet the requirements in the Resource Conservation and Recovery Act. Barrels would typically be stored temporarily under cover before being hauled to a hazardous waste disposal facility. A spill prevention plan and other plans would also be required (see Table 2.6.1 in Section 2.6.1.9).

### **2.3.2.8 NORMAL OPERATING HOURS**

Under the Proposed Action, it is anticipated that mining operations would occur 24 hours per day, five to seven days per week, and 52 weeks per year. The total number of operating days per year would be approximately 260–365.

### **2.3.2.9 SIGNAGE**

To facilitate health and safety requirements to the general public, all public access would be restricted and precluded in the tract for the life of the mining operation. An entrance identification sign would be posted and maintained at all major entrances into the area. The signs would contain the name, address, and telephone number of the operator, the name of the local authorized agent, the DOGM permit number of the operation, and notification of restricted access. Safety signs for the public would be used where appropriate.

### **2.3.2.10 ESTIMATED EMPLOYMENT REQUIREMENTS**

Under the Proposed Action, at maximum production, approximately 160 workers would be required to conduct mining operations. Approximately 100 of these workers would be employed at the tract and would be conducting mining operations. The remaining 60 workers would be engaged in transporting mined coal from the tract to market. It is assumed that mine employees would come primarily from Alton and surrounding towns located within approximately one to two hours (driving time) of the tract. These would include Kanab, Mt. Carmel, Orderville, Glendale, Hatch, Panguitch, Circleville, Kingston, Junction, Cedar City, Tropic, Enoch, Parowan, Paragonah, La Verkin, Hurricane, Henryville, and Escalante. Mine employees would be expected to commute to and from the work site using their private vehicles. No housing would be provided for mine employees at or near the tract.

### **2.3.2.11 TRAFFIC ESTIMATES**

Under the Proposed Action, there would be an estimated 153 trucks travelling daily to and from the tract and reasonably foreseeable coal loadout location (the transportation route and loadout location are described in Section 2.6.4 Reasonably Foreseeable Coal Loadout Location and Transportation Route). Loaded trucks, specifically designed to reduce loss of coal dust and larger coal particles while traveling, would carry approximately 42 tons of coal each.

Traffic would also be generated from employee commuting and service operations. Employees would commute from their homes to the tract according to the normal operating hours detailed in Section 2.3.2.8. Service operations would include delivery of diesel fuel and machine and equipment parts (daily or weekly), servicing of portable toilets (weekly or biweekly), servicing of permanent toilet facilities (monthly or bimonthly), removal of waste oil (weekly or biweekly), and incidental service operations such as delivery of office supplies (biweekly or monthly) as necessary.

### 2.3.2.12 KANAB FIELD OFFICE ROUTE 116 RELOCATION

To comply with the rules and regulations of SMCRA, portions of KFO Route 116 in the tract would need to be relocated so that no surface disturbance occurs within 100 feet on either side of the outside line of the road. Relocation of the road would allow the successful bidder to mine in-place coal reserves currently underlying portions of the road and the 100-foot buffer zone on either side of the road. This EIS analysis assumes that an agreement to relocate the road would be reached if the BLM decides to hold a competitive lease sale for the tract. The lessee would be responsible for road relocation. Mining would be feasible without relocating KFO Route 116; however, the total amount of recoverable coal would be reduced if KFO Route 116 were not relocated.

Under the Proposed Action, KFO Route 116 would be relocated, wherever possible, in the tract to a no-coal or recovered coal zone. While relocating the road to the no-coal zone or the recovered coal zone, the road would be sited to avoid disturbances to cultural resources, wetlands, floodplains, stream channels, and intact sagebrush stands wherever possible. Where it is not possible to avoid disturbances to these areas, mitigation measures would be prescribed. Access for and impacts to private landowners would also be considered while relocating the road. Under the Proposed Action, the northwest portion of the tract (Block NW) would contain a 0.8-mile stretch of KFO Route 116. It is assumed that this stretch of the road would be relocated onto previously mined surface in this portion of the tract, according to the mining sequence. It is also assumed that relocation of KFO Route 116 would be temporary and that it would be replaced in the approximate original (current) roadbed following mining.

## 2.4 Alternative C: Reduced Tract Acreage and Seasonal Restrictions

Under Alternative C, the Alton Coal Tract would be modified to exclude Block NW (see Map 2.2). Further, certain mining activities in the south portion of the tract (Block S) would be subject to seasonal restrictions to reduce impacts to the local Greater Sage-Grouse population (hereafter generally referred to as sage-grouse). Under Alternative C, the modified tract would be offered for a competitive lease sale, subject to lease stipulations developed for the tract. The boundaries of the modified tract and the area where seasonal restrictions would be required would be reasonably consistent with the configuration and information shown in Map 2.2.

Consistent with the purpose and need for the federal action, the intent of Alternative C is to resolve, in part or in full, the following: issues related to the local sage-grouse population, noise, and visual impacts to the town of Alton, and issues related to conflicting land uses (agriculture versus surface mining). As discussed in the environmental impacts analysis in Chapter 4, Alternative C may also reduce impacts to other resources such as springs and surface waters, wetlands, wildlife, soils, public health and safety, paleontological resources, cultural resources, and vegetation.

The BLM is also evaluating a potential modification to Alternative C that would eliminate the seasonal timing restrictions on Block S of the tract. Removing the restrictions would increase the maximum economic recovery of the coal resources present in the tract while staying within applicable legal and regulatory limits in terms of potential impacts. The BLM is considering such a modification to avoid potential exceedances of NAAQS for PM<sub>10</sub>, which were detected in the air resources analysis (see Section 4.3). Consideration of such an alternative is feasible because provisions of the sage-grouse mitigation plan and the exclusion of Block NW (which is used by sage-grouse in the Panguitch population) potentially make seasonal timing restrictions unnecessary to adequately reduce impacts to sage-grouse from leasing and mining activities. This modification did not necessitate the development of a separate alternative because the impacts of mining Block S absent such seasonal restrictions are already analyzed under the Proposed Action. For purposes of comparison, the analysis of impacts under Alternative C in this SDEIS retains those restrictions, giving the BLM the flexibility to impose them in any final decision.

### 2.4.1 Location and Overview

The modified tract would encompass approximately 3,173 acres, of which approximately 2,280 acres are federal surface and mineral estate and 893 acres are split estate; private surface estate and federal mineral estate (Map 2.2 depicts private and BLM surface in the modified tract). As under the Proposed Action, not all surface estates, private or federal, have coal reserves underlying them (Map 2.2 also depicts the approximate extent of the coal line in the tract). The legal description of the modified tract under Alternative C is in Table 2.4.1. The land description and acreages are based on the BLM Status of Public Domain and Mineral Titles approved Coal Plats as of August 21, 2002 and July 28, 2006.

Under Alternative C, recoverable portions of in-place coal reserves would be mined over approximately 21 years using surface-mining methods where the depth of overburden is approximately 200 feet or less, and using underground methods (development mining, longwall mining, and/or room and pillar mining) where the depth of overburden exceeds approximately 200 feet. The choice of mining method, however, can vary from the 200-foot overburden threshold depending on the coal thickness, overburden type, overburden (highwall) stability, underground mining techniques available, operating and capital costs, and coal market economics. Approximately 2 million tons of coal per year would be mined once topsoil stockpiling and initial overburden removal have occurred. Reclamation would be concurrent with mining over the course of the estimated 21-year life of the mine and would be followed by a potential 10-year reclamation and revegetation monitoring period. Although some reclamation of the final mining areas would be concurrent with development of new mining areas, due to seasonal timing design features developed as part of the alternative design, an additional mining area with concurrent reclamation would be developed under Alternative C for Block S of the tract. The length of time between surface disturbance initiation of the mining process and concurrently occurring reclamation activities would be extended for some pits until final mining occurs. An additional pit would remain disturbed and available for development while seasonal mining occurs on Block S.

**Table 2.4.1.** Legal Description of the Modified Alton Coal Tract under Alternative C

Legal Description <sup>*</sup>	Surface Owner <sup>†</sup>	Acres
<b>Township 39 South, Range 5 West, Salt Lake Meridian, Utah</b>		
Section 7, SE $\frac{1}{4}$ SW $\frac{1}{4}$ , S $\frac{1}{2}$ SE $\frac{1}{4}$	3	122
	5	7
Section 18, lots 3 and 4, E $\frac{1}{2}$ , E $\frac{1}{2}$ W $\frac{1}{2}$	BLM	357
	3	42
	16	158
	17	3
Section 19, lots 1 through 4, NE $\frac{1}{4}$ , E $\frac{1}{2}$ W $\frac{1}{2}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$ , SE $\frac{1}{4}$ SE $\frac{1}{4}$	BLM	472
	1a	120
Section 20, lots 4 and 5, N $\frac{1}{2}$ SW $\frac{1}{4}$	BLM	47
	1a	111
Section 30, lots 2 through 4, SW $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NW $\frac{1}{4}$ , E $\frac{1}{2}$ SW $\frac{1}{4}$ , W $\frac{1}{2}$ SE $\frac{1}{4}$	BLM	338
	1a	13
Section 31, lots 1 through 3, NE $\frac{1}{4}$ , E $\frac{1}{2}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$	BLM	471

**Table 2.4.1.** Legal Description of the Modified Alton Coal Tract under Alternative C

Legal Description*	Surface Owner†	Acres
<b>Township 39 South, Range 6 West, Salt Lake Meridian, Utah</b>		
Section 13, SE¼	BLM	160
Section 24, NE¼, N½NW¼, SE¼NW¼, E½SW¼, N½SE¼, SE¼SE¼	BLM	159
	11	4
	12	313
Section 25, E½NE¼, SW¼NE¼, SE¼	BLM	276
Error‡		5
<b>Total Private</b>		<b>893</b>
<b>Total BLM</b>		<b>2,280</b>
<b>Total LBA</b>		<b>3,178</b>

\* Based on the BLM Status of Public Domain Land and Mineral Titles approved Coal Plats as of August 21, 2002, and July 28, 2006.

† Where the BLM is the surface owner of the parcel, this is explicitly noted. Private surface owners are numbered rather than identified by name due to privacy concerns.

‡ The acreages above were calculated using ESRI ArcGIS 9.2 and NAD 1983 UTM Zone 12N coordinate system. The BLM shapefile of coal ownership is georeferenced (in NAD 1983 UTM Zone 12N), but is not survey accurate. ACD provided a hardcopy map (with surface ownership and section boundaries), which was scanned and georeferenced to section corners visible on USGS 7.5-minute topographic maps. Polygons were then digitized to encompass/represent each of the legal descriptions above using the BLM shapefile, ACD's georeferenced map, and the USGS 7.5-minute topographic map as references while digitizing. All acreages are approximate and have not been verified by ground surveys. The error is largely a result of the disparate sources for boundary data. Additionally, the ownership lines from the map provided by ACD do not align well in all locales with the BLM boundary. This suggests that one or both of these datasets are approximate and is another potential source of error.

BLM independently evaluated the coal resources included in the tract. They estimate that under Alternative C, the tract includes approximately 52.1 million tons of in-place coal and that an estimated 39.2 million tons of coal would be recoverable from the tract. BLM estimates that in areas where coal would be mined by surface-mining methods, approximately 90% of the estimated in-place coal reserves would be recoverable. However, in those portions of the tract that must be mined by underground mining methods, approximately 50% of the in-place coal reserves would be recoverable. These percentage recovery estimates are based on assumptions regarding the depth to which the use of surface-mining methods is feasible and the extent of the no-coal zone.

## 2.4.2 Preliminary Mine Plan

This section describes, on a conceptual level, the MRPs that would be used to mine and reclaim lands in the tract under Alternative C. The conceptual MRPs described here are not final plans but represent RFD for use in analyzing the potential environmental consequences of issuing a lease for the tract.

Post-mine reclamation, water requirements, blasting, lighting for nighttime operations, power generation, hazardous materials and hazardous and solid waste, normal operating hours, signage, estimated employment requirements, and traffic estimates would be the same under Alternative C as under the Proposed Action. Therefore, these components of the preliminary mine plan for Alternative C are not described below (see Sections 2.3.2.1–2.3.2.12 for these descriptions).

### 2.4.2.1 MINING METHODS AND MINE FACILITIES

It is anticipated that approximately 1,662 acres of surface disturbance would occur in the tract under Alternative C. Of this, 1,454 acres would be the result of surface-mining operations (pit disturbance). Centralized facilities associated with mining activities on the tract would be located in the same area, occupy the same acreage (36 acres), and include the same items as the Proposed Action (see Section

2.3.2.1; see Maps 1.2 and 2.2). Dispersed facilities necessary to conduct mining operations would also be the same as the Proposed Action (see Section 2.3.2.1), including avoidance criteria, though acres (135 acres) of disturbance would differ due to the differing size of the tract. Underground mining would occur on approximately 613 acres in the northeast section of the tract (see footnote 4 above for additional information on acreage of underground mining).

Mining methods employed under Alternative C would be the same as those under the Proposed Action (see Section 2.3.2.1). However, due to seasonal timing restrictions described in Section 2.4.2.3 (Sage-grouse Timing Restrictions), and as a result of the need for two simultaneously open pits (one “idle” [in Block S] during the period of the timing restriction and the other active [in another block of the tract] with the idle and active pits switching during the period where the timing restriction does not apply), Alternative C would likely involve a greater quantity of heavy equipment and an external overburden disposal area (EODA) occupying approximately 40–60 acres (depending on mining sequence) located on BLM-administered land. The EODA is an area where overburden, after excavation, is permanently stockpiled. It is often required when a new pit is opened that is not adjacent to an existing pit into which overburden would otherwise be placed as part of the concurrent mining and reclamation process. At any one time, active and suspended (due to seasonal timing restrictions) mining operations (open surface-mining pits from which coal is being removed, areas where topsoil and overburden are being removed, or both) would involve an estimated 240 acres (two pits). The depth of open pits from which coal is being removed would be up to approximately 200 feet, and highwall length would be up to 600 feet. An additional 240 acres or more would be in some stage of reclamation (overburden replacement and topsoiling, grading to approved PMT, or seedbed beginning). The UAC R645-301-553 requires rough backfilling and grading to follow coal removal by not more than 60 days or 1,500 linear feet; although, additional time may be granted if it can be demonstrated in a detailed written analysis that additional time is necessary.

#### **2.4.2.2 KANAB FIELD OFFICE ROUTE 116 RELOCATION**

As under the Proposed Action, to comply with the rules and regulations of SMCRA, portions of KFO Route 116 in the tract would need to be relocated so that no surface disturbance occurs within 100 feet on either side of the outside line of the road. Relocation of the road would allow the successful bidder to mine in-place coal reserves currently underlying portions of the road and the 100-foot buffer zone on either side of the road. This EIS analysis assumes that an agreement with Kane County to relocate the road would be reached if the BLM decides to hold a competitive lease sale for the tract. The lessee would be responsible for the costs of road relocation. Mining would be feasible without relocating KFO Route 116; however, the total amount of recoverable coal would be reduced if KFO Route 116 were not rerouted.

Under Alternative C, as under the Proposed Action, KFO Route 116 would be relocated, wherever possible, in the tract in the no-coal zone or the recovered coal zone. While relocating the road to the no-coal zone or the recovered coal zone, the road would be sited to avoid disturbances to cultural resources, wetlands, floodplains, stream channels, and intact sagebrush stands wherever possible. Where it is not possible to avoid disturbances to these areas, mitigation measures would be prescribed. Access for and impacts to private landowners would also be considered while relocating the road. It is assumed that relocation of KFO Route 116 would be temporary and that it would be replaced in the approximate original (current) roadbed following mining.

Unlike the Proposed Action, under Alternative C, road relocation (0.8 mile) would not be required for the stretch of KFO Route 116 that traverses Block NW because this portion of the tract is excluded from Alternative C (see Map 2.2).

### 2.4.2.3 SAGE-GROUSE TIMING RESTRICTIONS

Under Alternative C, timing restrictions would be in place for Block S to reduce impacts to the local sage-grouse population. Timing restrictions would prohibit active mining (and hence reduce associated impacts to sage-grouse) on this portion of the tract during a crucial period in the reproductive cycle of the species. Data show that a lek complex occurs partly on the tract and partly on adjacent private property, and that birds from this population use this portion of the tract during the nesting and brooding period. The location of the lek complex is described in more detail in Section 3.18.3.5.1. Under this alternative, no mining, mine-related, or surface-disturbing activities would be allowed within 0.5 mile of an active lek location during the lek establishment and strutting period (February 15–March 15). Likewise, no surface-disturbing activities would be allowed under this alternative on Block S during the local sage-grouse's strutting, nesting, and brooding period (March 15–July 15). This timing restriction would likely alter mining activities as compared to the Proposed Action. The KFO RMP (BLM 2008b) contains surface use stipulations that 1) prohibit surface-disturbing activities within 2 miles of a Greater Sage-Grouse lek in the nesting and brooding habitat from March 15 to July 15; 2) prohibit surface-disturbing activities within 0.5 mile of a Greater Sage-Grouse lek site; and 3) prohibit surface-disturbing activities in Greater Sage-Grouse winter habitat from December 1 to March 14. As noted in Chapter 1, an amendment to the KFO RMP is currently pending, which could change some or all of these restrictions. Before making a leasing decision, the BLM will have to verify that any terms in the lease are consistent with the applicable requirements of the RMP. It should be noted that if mining activities are not allowed within 2 miles of the Alton–Sink Valley lek, it would be economically unviable to mine the tract. Under the existing KFO RMP, it is possible to obtain an exception, modification, or waiver from these requirements. The BLM would have to verify the availability of such an exception, modification, or waiver before any decision to lease. For the purpose of analysis in this EIS, it is assumed that an exception, modification, or waiver could be granted. Such an exception, modification, or waiver of these stipulations would eliminate no surface occupancy protections within 0.5 mile of sage-grouse leks, allow surface-disturbing activities within 2 miles of sage-grouse leks from March 15 to July 15, and allow surface-disturbing activities in sage-grouse wintering habitat from December 1 to March 14. Alternative C, which was carried forward for detailed analysis, uses a 0.5-mile buffer around the lek to allow some mining to take place in the tract.

## 2.5 Alternative K1: Reduced Tract Acreage

In the DEIS, the BLM eliminated Alternative K1 from detailed analysis. However, based on public comments on the DEIS, the BLM has decided to consider Alternative K1 in detail in this SDEIS. Under Alternative K1, the Alton Coal Tract would be modified to exclude Block NW and Block S (see Map 2.3). Under this alternative, the modified tract would be offered for lease at a sealed-bid, competitive lease sale, subject to lease stipulations developed for the tract. The boundaries of the modified tract would be reasonably consistent with the configuration shown in Map 2.3.

Consistent with the purpose and need for the federal action, the intent of Alternative K1 is to resolve, in part or in full, the following: issues related to the local Greater Sage-Grouse population, noise and visual impacts to the town of Alton, and issues related to conflicting land uses (agriculture versus surface mining). Alternative K1 may also reduce impacts to other resources such as springs and surface waters, wildlife, soils, public health and safety, paleontological resources, cultural resources, vegetation, and air quality.

### 2.5.1 Location and Overview

The modified tract would encompass approximately 2,114 acres, of which approximately 1,227 acres are federal surface and mineral estate and 887 acres are split estate (private surface and federal mineral estate). As under the other action alternatives, not all surface estates, private or federal, have coal reserves underlying them. The legal description of the modified tract under Alternative K1 is in Table 2.5.1. The

land description and acreages are based on the BLM Status of Public Domain and Mineral Titles approved Coal Plats as of August 21, 2002 and July 28, 2006.

Under Alternative K1, recoverable portions of in-place coal reserves would be mined over approximately 16 years using surface-mining methods where the depth of overburden is approximately 200 feet, and using underground methods (development mining, auger mining, highwall mining, longwall mining, and/or room and pillar mining) where the depth of overburden exceeds approximately 200 feet. The choice of mining method, however, can vary from the 200-foot overburden threshold depending on the coal thickness, overburden type, overburden (highwall) stability, underground mining techniques available, operating and capital costs, and coal market economics. Approximately 2 million tons of coal per year would be mined once topsoil stockpiling and initial overburden removal have occurred. Reclamation would be concurrent with mining over the estimated 16-year life of the mine and would be followed by a potential 10-year reclamation and revegetation monitoring period.

**Table 2.5.1.** Legal Description of the Modified Alton Coal Tract under Alternative K1

Legal Description <sup>*</sup>	Surface Owner <sup>†</sup>	Acres
<b>Township 39 South, Range 5 West, Salt Lake Meridian, Utah</b>		
Section 7, SE ¼SW¼, S½SE¼	3	122
	5	7
Section 18, lots 3 and 4, E½, E½W½	BLM	357
	3	42
	16	158
	17	3
Section 19, lots 1 through 4, NE¼, E½W½, N½SE¼, SE¼SE¼	BLM	472
	1a	120
Section 20, lots 4 and 5, N½SW¼	BLM	47
	1a	111
<b>Township 39 South, Range 6 West, Salt Lake Meridian, Utah</b>		
Section 13, SE¼	BLM	160
Section 24, NE¼, N½NW¼, SE¼NW¼, E½SW¼, N½SE¼, SE¼SE¼	BLM	159
	11	4
	12	313
Section 25, NE¼NE¼	BLM	40
Error <sup>‡</sup>		5
<b>Total Private</b>		<b>880</b>
<b>Total BLM</b>		<b>1,235</b>
<b>Total LBA</b>		<b>2,114</b>

<sup>\*</sup> Based on the BLM Status of Public Domain Land and Mineral Titles approved Coal Plats as of August 21, 2002, and July 28, 2006.

<sup>†</sup> Where the BLM is the surface owner of the parcel, this is explicitly noted. Private surface owners are numbered rather than identified by name due to privacy concerns.

<sup>‡</sup> The acreages above were calculated using ESRI ArcGIS 9.2 and NAD 1983 UTM Zone 12N coordinate system. The BLM shapefile of coal ownership is georeferenced (in NAD 1983 UTM Zone 12N), but is not survey accurate. ACD provided a hardcopy map (with surface ownership and section boundaries), which was scanned and georeferenced to section corners visible on USGS 7.5-minute topographic maps. Polygons were then digitized to encompass/represent each of the legal descriptions above using the BLM shapefile, ACD's georeferenced map, and the USGS 7.5-minute topographic map as references while digitizing. All acreages are approximate and have not been verified by ground surveys. The error is largely a result of the disparate sources for boundary data. Additionally, the ownership lines from the map provided by ACD do not align well in all locales with the BLM boundary. This suggests that one or both of these datasets are approximate and is another potential source of error.

BLM independently evaluated the coal resources included in the tract. They estimate that under Alternative K1, the tract includes approximately 40.9 million tons of in-place coal, and that an estimated 30.8 million tons of coal would be recoverable from the tract. BLM estimates that in areas where coal would be mined by surface-mining methods, approximately 90% of the estimated in-place coal reserves would be recoverable. However, in those portions of the tract that must be mined by underground mining methods, approximately 50% of the in-place coal reserves would be recoverable. These percentage recovery estimates are based on assumptions regarding the depth to which the use of surface-mining methods is feasible and the extent of the no-coal zone.

## **2.5.2 Preliminary Mine Plan**

This section describes, on a conceptual level, the MRPs that would be used to mine and reclaim lands in the tract under Alternative K1. The conceptual MRPs described here are not final plans but represent RFD for use in analyzing the potential environmental consequences of issuing a lease for the tract.

Post-mine reclamation, water requirements, blasting, lighting for nighttime operations, power generation, hazardous materials and hazardous and solid waste, normal operating hours, signage, estimated employment requirements, and traffic estimates would be the same under Alternative K1 as under the Proposed Action. Therefore, these components of the preliminary mine plan for Alternative K1 are not described below (see Sections 2.3.2.1–2.3.2.12 for these descriptions).

### **2.5.2.1 MINING METHODS AND MINE FACILITIES**

It is anticipated that approximately 1,012 acres of surface disturbance would occur on the tract under Alternative K1. Of this, 869 acres would be the result of surface-mining operations (pit disturbance). Centralized facilities associated with mining activities on the tract would be located in the same area, occupy the same acreage (36 acres), and include the same items as the Proposed Action (see Section 2.3.2.1; see Maps 1.2 and 2.2). Approximately 92 acres of dispersed facilities would be needed under Alternative K1, as opposed to 160 acres of dispersed facilities under the Proposed Action. Underground mining would occur on approximately 613 acres in the northeast section of the tract (see footnote 4 above for additional information on acreage of underground mining).

Mining methods employed under Alternative K1 would be the same as those under the Proposed Action (see Section 2.3.2.1).

### **2.5.2.2 KANAB FIELD OFFICE ROUTE 116 RELOCATION**

As under the Proposed Action, to comply with the rules and regulations of SMCRA, portions of KFO Route 116 in the tract would need to be relocated so that no surface disturbance occurs within 100 feet on either side of the outside line of the road. Relocation of the road would allow the successful bidder to mine in-place coal reserves currently underlying portions of the road and the 100-foot buffer zone on either side of the road. This EIS analysis assumes that an agreement with Kane County to relocate the road would be reached if the BLM decides to hold a competitive lease sale for the tract. The lessee would be responsible for the costs of road relocation. Mining would be feasible without relocating KFO Route 116; however, the total amount of recoverable coal would be reduced if KFO Route 116 is not rerouted.

Under Alternative K1, as under the Proposed Action, KFO Route 116 would be relocated, wherever possible, in the tract in the no-coal zone or the recovered coal zone. While relocating the road to the no-coal zone or the recovered coal zone, the road would be sited to avoid disturbances to cultural resources, wetlands, floodplains, stream channels, and intact sagebrush stands wherever possible. Where it is not possible to avoid disturbances to these areas, mitigation measures would be prescribed. Access for and

impacts to private landowners would also be considered while relocating the road. It is assumed that relocation of KFO Route 116 would be temporary and that it would be replaced in the approximate original roadbed following mining.

Unlike the Proposed Action, under Alternative K1, road relocation (2 miles) would not be required for the stretches of KFO Route 116 that traverse Block NW and Block S because these portions of the tract are excluded from the tract configuration under Alternative K1 (see Map 2.3).

## **2.6 Management and Considerations Common to Each Action Alternative**

A number of management prescriptions and other considerations are common to each action alternative. These items are common to each action alternative for one or more of the following reasons: 1) they are already required by law or regulation for purposes of leasing and/or mining; 2) they are BMPs or management techniques that could be readily applied to reduce impacts regardless of alternative; 3) they were developed to address issues specific to the tract and could be readily applied to reduce impacts regardless of alternative; 4) they pertain to actions and/or plans already occurring and/or over which BLM has no jurisdiction; and 5) they pertain to BLM decisions related to the tract that are independent of decisions with respect to the Proposed Action, Alternative C, or Alternative K1 (i.e., BLM decisions regarding the Proposed Action, Alternative C, or Alternative K1 would not necessitate changes to decisions related to these items and vice versa).

Management and considerations common to each action alternative that are discussed in this section consist of

- permits, approvals, regulatory compliance, mitigation, and monitoring (Section 2.6.1)
- other roads in the tract (Section 2.6.2);
- potential short haul routes (Section 2.6.3); and
- reasonably foreseeable coal loadout location and transportation route (Section 2.6.4).

### **2.6.1 Permits, Approvals, Regulatory Compliance, Mitigation, and Monitoring**

There are certain permits, approvals, and regulatory compliance, mitigation, and monitoring measures that would be required under the action alternatives. These are related to 1) compliance with existing local, state, and federal rules and regulations with respect to surface coal mining and 2) special mitigation and monitoring requirements (i.e., design features) developed for the tract. See Table 1.5.1 in Chapter 1 and Table 2.6.1 below for a summary of permits, approvals, and regulatory compliance requirements for the successful bidder.

#### **2.6.1.1 LEASES**

A federal coal lease would be required of the lessee to access and remove coal from the tract. Under all action alternatives, the surface ownership of the tract is mixed (federal and private). The successful bidder would need to obtain private surface lease agreements from private surface owners to access leased federal coal reserves underlying private surface owners' lands. Tables 2.3.1, 2.4.1, and 2.5.1 (see Sections 2.3.1, 2.4.1, and 2.5.1) identify the number of private landowners and the acreage of private surface by legal description for the Proposed Action, Alternative C, and Alternative K1, respectively.

### **2.6.1.2 MINE PERMIT**

As previously discussed in Chapter 1, the issuance of a lease for the BLM-administered lands is a prerequisite for mining, but is not the enabling action that would allow mining to commence. The successful bidder would need to submit an application package (the PAP) to DOGM to obtain a permit to mine federal coal from the tract. DOGM reviews the PAP to ensure that it complies with the approved State of Utah permanent SMCRA program and other statutes. If it does comply, DOGM issues the applicant a permit to conduct site-specific surface coal mining operations. The approved permit to mine, a MRP, would define the operator's comprehensive MRP. All aspects of the MRP are developed in coordination with DOGM and other federal, state and local agencies. The MRP serves as a platform for the development of air quality, water quality and appropriation, and wetland and stream alteration permits potentially required from state and federal agencies. In addition to comprehensive resource assessment and evaluation, the MRP includes resource protection and mitigation measures and criteria for reclamation development and success. Some of these resource protection and mitigation measures are identified in this EIS analysis, though others may be identified in the permitting process. Reclamation requirements and criteria are identified in this EIS analysis as well. Utah's coal mining permit requirements are detailed in UAC R645 (see footnote 5 in Section 2.3.2.2).

### **2.6.1.3 RESOURCE RECOVERY AND PROTECTION PLAN**

The MLA requires that before conducting any federal coal development or mining operations on a federal coal lease, the operator must submit a R2P2 for review by the BLM, OSM, and DOGM. BLM, OSM, and DOGM recommend approval to the Assistant Secretary of the DOI, Lands and Minerals Management. Following these recommendations and MLA determinations, the Assistant Secretary approves the R2P2. Subsequent approvals of minor R2P2 modifications would be issued by the BLM unless the OSM determines that the modification is not minor and requires further approval by the Assistant Secretary (30 CFR 746.18).

The R2P2 would describe how the operation would meet the MLA requirements for due diligent development, production, resource recovery and protection (i.e., effective recovery of the federal coal reserves), continued operation, maximum economic recovery, and compliance with the rules detailed in 43 CFR 3480 for the life of the mine. The successful bidder would mine the leased tract according to the approved plan, respective lease terms, and appropriate rules and regulations.

### **2.6.1.4 AIR QUALITY**

An air quality permit would be required from the UDAQ. The permit would address allowable particulate and other emission levels and would stipulate mechanisms to be used to control emissions. As part of the air quality permit a dust control plan would be developed and implemented.

Continuous ambient air monitoring for PM<sub>10</sub>, NO<sub>2</sub>, and visibility would be required as a design feature and would be conducted according to the adaptive management strategy described in Section 4.3.1.1. The adaptive management strategy is designed to detect and address monitored air quality and air quality-related values (AQRV) degradation that can reasonably be attributed to emissions originating from mine activities on the tract. It would consist of targeted air monitoring, the refining of air quality analyses or modeling assessments as needed to determine whether an air quality or AQRV deterioration is reasonably attributable to mine operations, and the implementation of additional environmental protection and mitigation measures if necessary.

### **2.6.1.5 WATER QUALITY AND APPROPRIATION**

The Utah Division of Water Quality would review the storm discharge permit application (Utah Pollution Discharge Elimination System [UPDES] section of the PAP), and if the plan conforms and complies with applicable rules and regulations, specific environmental permits would be issued. The Utah State Engineer's Office would review specific applications to install monitoring and production wells, and would issue permits and appropriations in accordance with the successful bidder's needs and available water resources. Installation, use, and maintenance of monitoring and production wells would be at the mine operator's expense.

### **2.6.1.6 WETLAND AND STREAM CHANNEL ALTERATION**

In the event of a lease sale, as part of the mine permitting process, CWA Section 404 permit approval by the USACE would be required to authorize disturbances to jurisdictional wetlands. Likewise, modifications to Lower Robinson Creek (for placement of facilities), one or two road crossings of Lower Robinson Creek, and one or two road crossings of Kanab Creek (the number of crossings would depend on specific mining sequence and specific alignment of the rerouted KFO Route 116) would require stream alteration permits from the Utah State Engineer's Office. The permit applications would be reviewed by USACE for compliance with applicable rules and regulations. Permits would be issued by the State of Utah if the application meets the criteria.

Wetland and stream channel delineations were conducted on the tract by qualified wetland and stream channel delineators in May and June 2012 (Frontier Corporation USA 2012). Based on the results of the delineations, a preliminary jurisdictional determination (JD) was made by the USACE in November 2012 (USACE 2012b). The USACE's preliminary JD concludes that the tract contains the following potential waters of the U.S. regulated under Section 404 of the CWA (Map 2.4):

- 53.95 acres of wetlands
- 4.01 acres of open water
- 9,110 linear feet of perennial stream channel
- 17,629 feet of intermittent stream channel
- 29,295 linear feet of ephemeral stream channel
- 540 linear feet of road ditch
- 2,440 linear feet or irrigation ditch

Additional information related to wetland and stream channel features of the tract is provided in Section 3.16. Potential impacts associated with these features of the tract from implementation of the alternatives are discussed in Section 4.16.

### **2.6.1.7 GREATER SAGE-GROUSE**

In the event of a lease sale, the sage-grouse mitigation plan (see Appendix E) would be adopted as a design feature for any action alternative that is selected. The purpose of the sage-grouse mitigation plan is to describe the strategy for avoiding, reducing, and compensating for impacts to the sage-grouse populations potentially affected by leasing and mining the tract. The sage-grouse mitigation plan is intended to prevent mining activity surface disturbance from outpacing vegetation treatments aimed at increasing available habitat for sage-grouse. To ensure that mine disturbance does not outpace vegetation treatment, the sage-grouse mitigation plan would require that approximately 186.3 acres of initial vegetation treatment occurs in Block Sa prior to any surface-disturbing activities in the tract. Further, off-tract vegetation treatment mitigation projects intended to comply with the 4:1 mitigation ratio are to be

completed no more than one year following the corresponding on-tract surface disturbance, though they may be completed on a more accelerated schedule. Vegetation treatments would be prioritized in areas of pinyon-juniper encroachment that have sagebrush understory and are near the tract and adjacent to occupied habitat. Vegetation treatments would also be required to use techniques that ensure suitable habitat, such as a lop-and-scatter approach to pinyon-juniper removal.

The sage-grouse mitigation plan is also intended to address the BLM Washington Office IM 2012-043, which identifies the need to cumulatively maintain or enhance sage-grouse habitat. The sage-grouse mitigation plan complies with this IM by instituting the following requirements:

- Avoiding habitat through the designation of limited-touch areas in sagebrush habitats in the tract
- Enhancing Block Sa (comprising 186.3 acres) and the portions of Block S that have not yet been enhanced before mining activities begin
- Requiring that Blocks S and NW are not be mined simultaneously so one would provide a refuge while the other is experiencing surface disturbances due to mining
- Reclaiming in-tract sagebrush habitats to vegetation standards that would provide sage-grouse habitat in the long term
- Providing a 4:1 ratio of mitigation acres to surface disturbance acres to increase available habitat in the analysis area in the short term

The goals of the sage-grouse mitigation plan are as follows:

- Offset habitat impacts of mining the tract, as identified through the EIS process, by implementing habitat management and vegetation treatment projects in the mitigation plan area.
- Identify mitigation opportunities that reduce or remove threats under the five listing factors used by the USFWS to assess the status of ESA-listed and candidate species. A detailed discussion of these factors can be found in *Endangered and Threatened Wildlife and Plants; 12-month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered; Proposed Rule* (50 CFR 17, *Federal Register* 75:13910–14014).

These factors are as follows:

- The presence of threatened destruction, modification, or curtailment of habitat or range, including urbanization, energy development, mining, fences, fire, invasive plants, pinyon-juniper encroachment, climate change, and habitat fragmentation.
- Overuse for commercial, recreational, scientific, or educational purposes, including hunting, bird watching, Native American religious use, and scientific studies
- Disease and predation, including the potential for West Nile virus outbreaks, and increased predation.
- Inadequacy of existing regulatory mechanisms at the local, state, federal, and international levels<sup>8</sup>.
- Other natural or human-made factors affecting the species' continued existence, including pesticides, contaminants, recreational activities, life history traits that may affect viability, and drought.
- The key threats to sage-grouse in the mitigation plan area are increased predator populations, vegetation management (conflicting uses or lack of management), energy development, conifer encroachment and residential/commercial development (Frey et al. 2008; USFWS 2013a), as described in Section 5 of this document.

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<sup>8</sup>The findings were published on March 5, 2010. Since that time, regulatory mechanisms have been created to address threats to Greater Sage-Grouse, such as the sage-grouse conservation plan (UDWR 2013); a resolution passed by Kane County, Utah, on April 22, 2013, with the goal to protect, maintain, improve, and enhance Greater Sage-Grouse habitat in Kane County; and the BLM's IM No. 2012-043, which was published on December 22, 2011, and ensures that interim conservation policies and procedures are implemented when field offices authorize or carry out activities on public land while the BLM develops and decides how to best incorporate long-term conservation measures for Greater Sage-Grouse into applicable land use plans.

## 2.6 Management and Considerations Common to Each Action Alternative

- Establish potential mitigation project types and locations based on the availability of existing site-specific sage-grouse population information (e.g., lek counts) and ecological condition information (e.g., habitat location and size, opportunity locations, and completed vegetation treatment locations). This site-specific information includes data gathered for the adjacent Coal Hollow Mine, which has been in operation since 2010. Monitoring data regarding sage-grouse population and activity have been gathered, and continue to be gathered, in association with this mine. The existing site-specific population information may not be conclusive, but it can be used to help inform project planning.
- Ensure the short and long-term persistence of
  - the current southern-most population of Greater Sage-Grouse across the range of the species, and
  - suitable habitat to support that population.

**2.6.1.8 NIGHT SKY**

In the event of a lease sale, design features addressing potential impacts to night skies would be reflected in lease stipulations in the ROD. The purpose of these lease stipulations would be to reduce potential night sky impacts from artificial lighting used during mining activities. One design feature would require the development of a detailed mine lighting plan. In development of the mine lighting plan, further consultation will be required with NPS to fully examine techniques, technology/equipment, and mitigation measures available to effectively protect night sky quality, realizing technology may be improved at the time a lighting plan is developed, carrying forward an adaptive management approach. Such a lighting plan would allow the BLM and NPS to continue to monitor potential impacts to night sky from mining activities on the tract. Another design feature would require an initial lumens cap on all lighting on the tract. In the absence of a detailed mine plan, a maximum initial lumens cap of 3.15 million lumens was decided on to provide flexibility for a lessee to have adequate lighting for mine employee safety while still putting a limit on the amount of light potentially contributing to increased skyglow. Another design feature would require the use of full cut-off shields for all fixed-position light poles at centralized facilities. Full cut-off shields would reduce the amount of artificial lighting contributing to skyglow.

**2.6.1.9 DESIGN FEATURES, REGULATORY COMPLIANCE, MITIGATION, AND MONITORING**

Design features are environmental protection measures, actions, or practices that are part of the Proposed Action and all action alternatives and would be implemented by the lessee. They are described in this chapter and summarized as appropriate in the impacts analysis in Chapter 4. SMCRA and Utah State law require surface coal mines to collect extensive baseline information and to implement extensive monitoring programs and mitigation measures. Monitoring programs and mitigation measures that are required by regulation are essentially design features and are considered to be part of any action alternative for the tract. If BLM issues a lease, an approved PAP for mining operations on the tract would be required before mining operations could be conducted. The major mitigation and monitoring measures that are required by state or federal regulation are listed in Table 2.6.1. Some of these are also summarized in greater detail above (Sections 2.6.1.1 through 2.6.1.8). Those measures that are applicable to the mining operation under any action alternative would be implemented, as necessary, and they have been incorporated into the analysis. Lease stipulations would generally reflect the measures, actions, and practices identified as additional design features in Table 2.6.1, and would be applied to the lessee in the lease contract following issuance of the ROD. The design features identified in Table 2.6.1 have been incorporated into the analysis of the action alternatives. As described in the following paragraph, the BLM can also choose to adopt potential mitigation measures as lease stipulations in the lease contract following issuance of the ROD.

During the NEPA process, if there are impacts not addressed by the existing required measures (see Table 2.6.1 and above), the BLM can require further mitigation measures, in the form of stipulations on the lease, within the limits of its regulatory authority. Potential mitigation measures include additional means, measures, or practices not incorporated into the Proposed Action or alternatives as design features that would further reduce or eliminate impacts. These mitigation measures are specific to resource sections and are considered following the impact analyses for each resource in Chapter 4. In general, the levels of mitigation and monitoring required for surface coal mining by SMCRA and Utah State law are more extensive than those required for other surface-disturbing activities; however, concerns may periodically be identified that are not normally monitored or mitigated under existing procedures. These concerns would be addressed by DOGM under the requirements of the ongoing five-year permit review process. DOGM is the permitting agency with primary regulatory authority over compliance and mitigation associated with the exploration, development, and reclamation of coal mining operations. The State of Utah and the DOI have entered into a cooperative agreement defining the scope of jurisdiction for DOGM (representing the State of Utah) and the OSM (representing the DOI) regarding issues such as funding, permit application and review, reclamation bonding, and enforcement matters (30 CFR 944.30). UDAQ is the permitting agency with end authority over air quality compliance and mitigation. Both DOGM and UDAQ would work with the BLM to ensure compliance with regulatory and other requirements.

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>AIR RESOURCES</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Monitor on-site air quality for PM<sub>10</sub>.</li> <li>• Monitor off-site ambient PM<sub>10</sub>.</li> <li>• Conduct on-site compliance inspections.</li> <li>• Periodically monitor airblast frequency levels (conducted by operator), establish ground vibration limits before blasting plan is approved and is monitored by seismograph or scaled-distance equation; and keep records of on-site blasting for three years.</li> <li>• Conduct dispersion modeling of mining plans for annual average particulate pollution impacts on ambient air.</li> <li>• Employ particulate pollution control technologies.</li> <li>• Employ work practices designed to minimize fugitive particulate emissions.</li> <li>• Use EPA-mandated or state-mandated best available control technology, which may include the following:             <ul style="list-style-type: none"> <li>○ Watering or using chemical dust suppression (magnesium chloride [MgCl]) on haul roads and exposed soils</li> <li>○ Promptly mulching and revegetating exposed soils</li> <li>○ Using high efficiency baghouse dust collection systems or passive enclosure containment systems, or atomizers/foggers on the crusher, conveyor transfer, storage bin and train loadout, meeting a standard of 0.01 grain per dry standard cubic foot of exit volume</li> <li>○ Watering of active work areas</li> <li>○ Putting in place a reclamation plan to minimize surface disturbances subject to wind erosion;</li> <li>○ Graveling of access roads with subsequent watering or chemical treatment for dust abatement to meet air quality standards</li> <li>○ Limiting haul truck speeds</li> <li>○ Limiting material drop heights for shovels</li> </ul> </li> <li>• Implement measures to avoid exposing the public to NO<sub>2</sub> from blasting clouds, including the following:             <ul style="list-style-type: none"> <li>○ Notifying neighbors and employees at least 24 hours prior to initial blasting according to an approved blasting schedule</li> <li>○ Publishing the blasting schedule in a newspaper at least 10 days prior to initial blasting, and distributing copies of the blasting schedule to local governments and public utilities and residents within 0.5 mile of the mining area (republishing every 12 months or more frequently if the schedule changes)</li> <li>○ Notifying each person who resides or works within a 0.5-mile radius of the mining area of the blasting schedule and the meaning of the signals used in the blasting</li> <li>○ Timing blasts to avoid temperature inversions and to minimize inconvenience to neighbors</li> <li>○ Closing public roads, when appropriate, to protect the public</li> <li>○ Minimizing blast sizes</li> <li>○ Posting signs on all entrances to the permit area from public roads or highways</li> <li>○ Incorporating any applicable air resources stipulations from the KFO RMP (BLM 2008b)</li> </ul> </li> </ul>

**Table 2.6.1. Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features**

Additional design features	<ul style="list-style-type: none"> <li>• Use ultra-low sulfur diesel fuel in generators.</li> <li>• Use EPA Tier 4 emissions controls on generators.</li> <li>• Comply with adaptive management strategy negotiated between the BLM and NPS.</li> <li>• Do not permit surface mining where overburden depths exceed approximately 200 feet.</li> <li>• Conduct continuous ambient air monitoring for PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, and visibility according to the adaptive management strategy.</li> <li>• Install fencing to restrict public access to active mining areas.</li> <li>• Require blasting provisions for wind speed, direction, and variability, plus provisions for public notifications/alerts during blasting events.</li> <li>• Require diesel oxidation catalysts on heavy equipment.</li> <li>• Implement a dust control plan.</li> <li>• See Table 4.3.1 for specific design features and project design assumptions.</li> </ul>
<b>ALLUVIAL VALLEY FLOORS</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Identify all AVFs in or adjacent to the permit area (DOGM).</li> <li>• Determine significance to agriculture of all identified AVFs affected by mining (DOGM).</li> <li>• Protect downstream AVFs during mining.</li> <li>• Restore essential hydrologic function of all AVFs affected by mining.</li> <li>• Monitor to determine restoration of essential hydrologic functions of any declared AVFs.</li> <li>• Incorporate any applicable AVF stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• None identified at this time</li> </ul>
<b>COAL</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Achieve maximum economic recovery of the coal resources in the tract (MLA and BLM coal leasing regulations).</li> <li>• Successful bidder inspections and reporting to the BLM.</li> <li>• Incorporate any applicable coal resources stipulations from the BLM-KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• None identified at this time</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>CULTURAL RESOURCES AND NATIVE AMERICAN CONCERNS</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Conduct Class I and III surveys to identify cultural properties on all state and federal lands and on private lands affected by federal undertakings.</li> <li>• Consult with the state historic preservation office (SHPO) to evaluate eligibility of cultural properties for the NRHP.</li> <li>• Consult with SHPO to evaluate effects of the federal action on historic properties.</li> <li>• Avoid or recover data from significant cultural properties identified by surveys, according to the approved historic properties treatment plan (HPTP).</li> <li>• Notify appropriate federal personnel if historic or prehistoric materials are uncovered during mining operations.</li> <li>• Instruct employees of the importance of and regulatory obligations to protect cultural resources.</li> <li>• Consult Native American tribes with known interest in this area of leasing action and request for help in identifying potentially significant religious or cultural sites.</li> <li>• Comply with Native American Graves Protection and Repatriation Act.</li> <li>• Monitor and mitigate according to the approved HPTP.</li> <li>• Incorporate any applicable cultural resources stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• Comply with stipulations of the programmatic agreement between the BLM-KFO, OSM, DOGM, and Utah State Historic Preservation Officer regarding the Alton Coal Tract LBA.</li> </ul>
<b>GEOLOGY AND MINERALS</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Identify and selectively place or mix chemically or physically unsuitable overburden materials to minimize adverse effects to vegetation or groundwater. DOGM requires analysis in advance of mining to detect unsuitable overburden.</li> <li>• Restore topography to AOC as required by UAC R645-301-553.100.</li> <li>• Incorporate any applicable geological resources stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• Monitor areas susceptible to subsidence due to underground mining; notify DOGM and BLM within 24 hours of the formation of sinkholes; repair sinkholes through backfilling or grouting as required by UAC R645-301-553.100; and use barricades or fences where necessary to protect recreationists and wildlife from sinkholes.</li> </ul>
<b>GROUNDWATER QUALITY</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Evaluate cumulative impacts to water quality associated with mining.</li> <li>• Replace existing water rights that are interrupted, discontinued, or diminished by mining with water of equivalent quality.</li> <li>• Monitoring wells serve to track water quality in overburden, coal, interburden, underburden, and backfill.</li> <li>• Do not materially damage the quality of water in underground water systems that supply AVFs (30 USC 1260(b)(5)(B); UAC R645-301-731.100).</li> <li>• Minimize disturbances to the prevailing hydrologic balance at the tract and in associated off-site areas and to the quality of water in groundwater systems both during and after surface coal mining operations and during reclamation (30 USC 1265(b)(10); UAC R645-301-731.100).</li> <li>• Incorporate any applicable groundwater quality stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>GROUNDWATER QUANTITY</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Evaluate cumulative impacts to water quantity associated with mining.</li> <li>• Replace existing water rights that are interrupted, discontinued, or diminished by mining with water of equivalent quantity.</li> <li>• Monitoring wells serve to track water levels in overburden, coal, interburden, underburden, and backfill.</li> <li>• Do not materially damage the quantity of water in underground water systems that supply AVFs (30 USC 1260(b)(5)(B); UAC R645-301-731.100).</li> <li>• Minimize disturbances to the prevailing hydrologic balance at the tract and in associated off-site areas and to the quantity of water in groundwater systems both during and after surface coal mining operations and during reclamation (30 USC 1265(b)(10); UAC R645-301-731.100).</li> <li>• Incorporate any applicable groundwater quantity stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>
<b>HAZARDOUS AND SOLID WASTE</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Dispose of solid waste and sewage according to approved plans.</li> <li>• Store and recycle waste oil.</li> <li>• Maintain files containing Material Safety Data Sheets for all chemicals, compounds, and/or substances used during the course of mining and reclamation.</li> <li>• Ensure that all production, use, storage, transport, and disposal of hazardous materials is in accordance with applicable existing or hereafter promulgated federal and state government requirements.</li> <li>• Comply with emergency reporting requirements for releases of hazardous materials as established in the Comprehensive Environmental Response, Compensation, and Liability Act (or Superfund) of 1980, as amended.</li> <li>• Prepare and implement spill prevention control and countermeasure plans, spill response plans, inventories of hazardous chemical categories pursuant to Section 312 of the Superfund Amendments and Reauthorization Act of 1986, as amended.</li> <li>• Prepare emergency response plans.</li> <li>• Incorporate any applicable hazardous and solid waste stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>
<b>LAND USE</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Suitably restore reclaimed areas for historic uses (grazing and wildlife).</li> <li>• Monitor controlled grazing prior to bond release evaluation (also see vegetation monitoring requirements).</li> <li>• Obtain a conditional use permit from Kane County to mine lands currently zoned as agricultural.</li> <li>• Incorporate any applicable land use stipulations from the KFO RMP.</li> <li>• Replace all damaged, disturbed, or displaced corner monuments (section corners, quarter corners, etc.), their accessories, and appendages (witness trees, bearing trees, etc.), or restore them to their original condition and location, or at other locations that meet the requirements of the rectangular surveying system per the standards and guidelines found in the Manual of Surveying Instructions, DOI.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>NOISE</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Protect employees and local members of the community from hearing loss.</li> <li>• Conduct MSHA inspections.</li> <li>• Incorporate any applicable noise stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• In the DOGM-approved mining plan, a blasting plan would be approved that is sensitive to noise impacts on wildlife, residents of the town of Alton, and points in Bryce Canyon National Park. The plan would be reviewed for comment by the BLM, USFWS, and UDWR before it is approved by the DOGM and before any blasting activity takes place.</li> <li>• Develop a noise monitoring and mitigation plan that addresses noise impacts on wildlife and residents of the town of Alton.</li> </ul>
<b>PALEONTOLOGICAL RESOURCES</b>	
Federal, state, and local requirements	<ul style="list-style-type: none"> <li>• Notify appropriate federal personnel if potentially significant paleontological sites (significant large vertebrate specimens) are discovered during mining, and halting mining in that portion of the mine until the specimen(s) can be collected with accepted scientific techniques.</li> <li>• Incorporate any applicable paleontological resources stipulations from the KFO RMP.</li> </ul>
Additional design features	<ul style="list-style-type: none"> <li>• Monitor spoils heaps in the active portion of the mine every five days during operations to locate and collect significant fossils as they appear.</li> <li>• Establish a fund (available through a competitive granting process to academic institutions, museums, federal, state, local, or other qualified parties) in the amount of \$100,000 for research on the same types of resources on adjacent public lands.</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>SAGE-GROUSE</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• See Section 1.7.1.2.2; for purposes of analysis in this EIS, it is assumed that an exception, modification, or waiver would be granted in the event of a lease. Lease stipulations detailed below would apply.</li> <li>• The Washington Office IM 2012-043 (BLM 2011c) identifies the need to “cumulatively maintain or enhance Greater Sage-Grouse habitat.” The IM requires the BLM to determine, in coordination with the respective state wildlife agency, whether the proposed leasing decision would likely have more than minor adverse effects to Greater Sage-Grouse and its habitat.</li> <li>• Incorporate any applicable sage-grouse stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• Comply with the requirements of the sage-grouse mitigation plan (see Appendix E).</li> <li>• Create or enhance nesting and brooding habitat on BLM-administered land in the tract in the no-coal zone (habitat creation/enhancement area identified as Block Sa in maps).</li> <li>• Following short- and medium-term mitigation and habitat reclamation measures, including the following: <ul style="list-style-type: none"> <li>• Reclaiming to AOC and seeding with sagebrush and grasses based on approved ecological site descriptions</li> <li>• Protecting sagebrush stands in no-coal zones as habitat to the extent practicable</li> <li>• Locating centralized and dispersed facilities to create the least possible disturbance to sage-grouse and sage-grouse habitat</li> <li>• Clearing young juniper from intact sagebrush stands</li> <li>• Cutting back juniper woodlands surrounding intact sagebrush stands</li> </ul> </li> <li>• On Block S of the tract, following long-term habitat reclamation measures, including the following: <ul style="list-style-type: none"> <li>• Creating range sites based on approved ecological site descriptions (conditions for the growth of grasses, forbs, and sagebrush) for reclamation purposes</li> <li>• Planting bare root or potted sagebrush and bitterbrush transplants in identified sites to accelerate shrub reestablishment</li> <li>• Seeding/planting in the fall</li> </ul> </li> <li>• Remove juniper and pinyon seedlings found in reclaimed areas until full release of the reclamation bond.</li> <li>• Conduct post-reclamation surveys for undesirable/ invasive plant species on biannual basis (spring and fall).</li> <li>• Begin monitoring in the next growing season after fall seeding/planting and monitor until reclamation goals are achieved.</li> <li>• Monitor reclamation sites to assess habitat reclamation success.</li> <li>• Monitor bird population (currently in the Alton area) throughout the year to assess bird survival, nest site and nest success, brood-rearing sites, and key winter habitat areas.</li> <li>• Conduct mosquito abatement in holding ponds and standing water to reduce the potential for transmission of West Nile Virus to sage-grouse.</li> </ul>
<b>SOCIOECONOMICS</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Pay royalties and taxes as required by federal, state, and local regulations.</li> <li>• Survey and report to document volume of coal removed.</li> <li>• Incorporate any applicable socioeconomics stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>SOIL</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Salvage soil suitable to support plant growth for use in reclamation.</li> <li>• Protect soil stockpiles from disturbance and erosional influences.</li> <li>• Selectively place suitable topsoil on the graded backfill overburden surface to meet guidelines for vegetation root zones.</li> <li>• Order one soil survey to establish baseline conditions of fertility and soil type and to establish topsoil depth.</li> <li>• Sample regraded overburden for compliance with root zone criteria. Soil sampling of replaced topsoil would be used to determine amendments to be added prior to seeding.</li> <li>• Incorporate any applicable soil stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>
<b>SURFACE WATER</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Build and maintain sediment control ponds or other devices during mining.</li> <li>• Restore approximate original drainage patterns during reclamation.</li> <li>• Restore stock ponds and playas during reclamation.</li> <li>• Conduct necessary UPDES storm water discharge permitting.</li> <li>• Monitor storage capacity in sediment ponds.</li> <li>• Monitor quality of discharges through the UPDES permit.</li> <li>• Monitor stream flow and water quality in selected springs in and adjacent to the tract.</li> <li>• Do not materially damage the quantity or quality of water in surface-water systems that supply AVFs (30 USC 1260(b)(5)(B); UAC R645-301-731.100).</li> <li>• Minimize disturbances to the prevailing hydrologic balance at the tract and in associated off-site areas and to the quality and quantity of water in surface-water systems both during and after surface coal mining operations and during reclamation (30 USC 1265(b)(10); UAC R645-301-731.100).</li> <li>• Incorporate any applicable surface water stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>
<b>THREATENED, ENDANGERED, PROPOSED, AND CANDIDATE SPECIES</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Survey for threatened, endangered, proposed, and candidate species and their habitat.</li> <li>• Avoid disturbance of identified habitat for threatened, endangered, proposed, and candidate species (see above for sage-grouse).</li> <li>• Restore habitat for threatened, endangered, proposed, and candidate species in areas disturbed by mining.</li> <li>• See Wildlife Resource section below.</li> <li>• Conduct baseline and annual wildlife monitoring surveys.</li> <li>• Incorporate any applicable threatened, endangered, proposed, and candidate species stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>TOPOGRAPHY AND PHYSIOGRAPHY</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Restore to approved AOC as required by UAC R645-301-553.100. (Any variances to AOC would be provided in a plan to DOGM and must be approved.)</li> <li>• Check as-built versus approved topography with each annual report (DOGM).</li> <li>• Incorporate any applicable topography and physiography stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time</li> </ul>
<b>TRANSPORTATION FACILITIES</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Relocate existing public roads, if necessary, in accordance with specific agreement between road authority, surface management agency, and coal lessee.</li> <li>• Incorporate any applicable transportation stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>
<b>VEGETATION</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Permanently revegetate reclaimed areas according to a comprehensive revegetation plan using approved reclamation seed mixtures consisting of suitable native and non-native species.</li> <li>• Reclaim 20% of reclaimed area with native shrubs at a density of one per square meter.</li> <li>• Control erosion on reclaimed lands prior to seeding with final seed mixture using mulching, cover crops, or other approved measures.</li> <li>• Chemically and mechanically control weed infestation.</li> <li>• Directly haul topsoil wherever possible.</li> <li>• Selectively plant shrubs in riparian areas.</li> <li>• Plant sagebrush.</li> <li>• Create depressions and rock piles.</li> <li>• Use special planting procedures around rock piles.</li> <li>• Post reclamation bond covering the cost of reclamation.</li> <li>• Monitor revegetation growth and diversity until release of final reclamation bond (minimum 10 years).</li> <li>• Monitor erosion to determine need for corrective action during establishment of vegetation.</li> <li>• Use grazing exclosures and vegetation monitoring during revegetation evaluation to determine suitability for post-mining land uses.</li> <li>• Incorporate any applicable vegetation stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

<b>VISUAL RESOURCES AND NIGHT SKY</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Restore landscape character during reclamation through returning to AOC and revegetation with suitable native and non-native species.</li> <li>• Incorporate any applicable visual resources stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• Develop a detailed mine lighting plan. In developing the mine lighting plan, further consultation will be required with NPS to fully examine techniques, technology/equipment, and mitigation measures available to effectively protect night sky quality, realizing technology may be improved at the time a lighting plan is developed, carrying forward an adaptive management approach.</li> <li>• Light from all light sources (fixed position light poles, portable light towers, and equipment lighting) shall not exceed 3,150,000 initial lumens subject to approval by the authorized officer.</li> <li>• Use full shielding on fixed position light poles at centralized facilities.</li> </ul>
<b>WETLANDS</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Identify all wetlands that would be affected by mining.</li> <li>• Identify jurisdictional wetlands (USACE).</li> <li>• Replace all jurisdictional wetlands that would be disturbed by mining.</li> <li>• Replace functional wetlands as required by surface managing agency, surface landowner, and/or DOGM.</li> <li>• Monitor reclaimed wetlands using the same procedures used to identify pre-mining jurisdictional wetlands.</li> <li>• Incorporate any applicable wetlands stipulations from the KFO RMP.</li> </ul>
Additional Design Features	<ul style="list-style-type: none"> <li>• None identified at this time.</li> </ul>
<b>WILDLIFE AND SPECIAL STATUS SPECIES</b>	
Federal, State, and Local Requirements	<ul style="list-style-type: none"> <li>• Restore pre-mining topography to the maximum extent possible.</li> <li>• Plant a diverse mixture of grasses, forbs, and shrubs in configurations beneficial to wildlife.</li> <li>• Design fences to permit wildlife passage.</li> <li>• Increase habitat diversity by creating rock clusters and shallow depressions on reclaimed land.</li> <li>• Use appropriate plantings along reclaimed drainages.</li> <li>• Replace drainages, wetlands, and AVFs disturbed by mining.</li> <li>• Enforce appropriate vehicle speed limits to minimize mortality.</li> <li>• Instruct employees not to harass or disturb wildlife.</li> <li>• Follow approved raptor mitigation plans such as the USFWS <i>Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances</i> (USFWS 2002).</li> <li>• Conduct baseline and annual wildlife monitoring surveys.</li> <li>• Monitor for migratory bird species of management concern in Utah.</li> <li>• Incorporate any applicable wildlife and special status species stipulations from the KFO RMP.</li> </ul>

**Table 2.6.1.** Regulatory Compliance or Mitigation Required by Federal, State, or Local Law and Additional Design Features

Additional Design Features	<ul style="list-style-type: none"> <li>• Design fences proposed in big game habitat to reduce impacts to big game movement, as well as reduce vehicle-wildlife collisions. BLM would consult with the UDWR on the design and location of new fences.</li> <li>• Prior to ground-disturbing activities, conduct migratory bird nest surveys and, if possible, conduct ground-disturbing and vegetation removal activities outside of critical breeding seasons for migratory birds. If it is not possible to conduct these activities outside of breeding season, make certain a qualified biological monitor is present to ensure compliance with Migratory Bird Treaty Act of 1918 (MBTA).</li> <li>• Develop a blasting plan that is sensitive to noise impacts on wildlife, residents of the town of Alton, and points in Bryce Canyon National Park where the analysis shows blasting-related impacts.</li> <li>• Minimize construction activities in big game crucial summer habitat from May 15 to July 15.</li> <li>• To avoid incidental take, perform any ground-disturbing activities or vegetation treatments before migratory birds begin nesting or after all young have fledged.</li> <li>• If activities must be scheduled to start during the migratory bird breeding season, take appropriate steps to prevent migratory birds from establishing nests in the potential impact area. These steps could include covering equipment and structures to prevent nest-building, covering existing nests with materials approved by USFWS to prevent use, and employing biological monitors to ensure no active nests are disturbed.</li> <li>• If activities must be scheduled during the migratory bird breeding season, perform a site-specific survey for nesting birds starting at least two weeks before groundbreaking activities or vegetation treatments. Do not move established nests with eggs or young, and do not harass birds until all young have fledged and are capable of leaving the nest site.</li> <li>• Develop a migratory bird conservation plan at the permitting stage to address and mitigate for migratory bird habitat losses resulting from mine operation.</li> </ul>
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### **2.6.2 Other Roads in the Alton Coal Tract**

Besides KFO Route 116, other roads exist in the tract (see Map 1.4). These include roads identified by Kane County as K3150, K3115, K3120, K3125, K3135, K3140, K3145, and K3155. Roads on BLM-administered land and overlying coal reserves would either be temporarily closed or relocated (following avoidance criteria previously detailed) during active mining operations to allow for full recovery of coal resources in these areas. Following mining, these roads would be replaced in accordance with the travel plan in the land use plan, and any temporary roads created would be reclaimed. Temporary road relocations and/or closures would be determined in consultation with the successful bidder and Kane County. Roads on private land and overlying coal reserves would be closed during active mining operations. Permanent or temporary relocation of these roads would be determined in consultation with the private landowner and Kane County. This EIS analysis assumes that roads located on private land would be closed during active mining operations and replaced in their pre-existing locations and conditions following completion of mining and reclamation.

The BLM would coordinate with the appropriate Kane County officials related to all temporary road closures and/or relocations. The BLM recognizes that it is important to coordinate with Kane County related to matters concerning the relocation and/or temporary closure of KFO Route 116 and other roads on the tract. The State of Utah and Kane County may hold valid existing ROWs in the tract pursuant to RS 2477 codified at 43 USC 932. On October 21, 1976, U.S. Congress repealed RS 2477 through passage of FLPMA. This EIS analysis does not adjudicate, analyze, or otherwise determine the validity of claimed ROWs. However, nothing in this EIS analysis extinguishes any valid ROW, or alters in any way the legal rights the State of Utah and Kane County have to assert and protect RS 2477 rights. Also, nothing in this EIS analysis restricts the rights of the State of Utah and Kane County to challenge in federal court or other appropriate venue any use restrictions imposed by the BLM's decisions regarding leasing that they believe are inconsistent with their rights.

### **2.6.3 Reasonably Foreseeable Potential Short Haul Route (tract to KFO Route 116 north of Alton)**

One reasonably foreseeable potential short haul route exists for transporting coal from the tract to KFO Route 116 north of the town of Alton (Map 2.5). This route would traverse private surface on Block NW south of Alton, and would then head north across private surface and connect with KFO Route 116 west of Alton. This short haul route is described as reasonably foreseeable because it is already planned for potential use by the applicant (ACD) for moving mined coal from the Coal Hollow Mine, adjacent to the tract, to KFO Route 116 west of Alton. If the BLM decides to hold a competitive lease sale for the tract and a lease is issued to ACD, it is reasonably foreseeable that ACD would continue to use this short haul route while mining coal reserves contained in the tract. A successful bidder other than ACD may use a different short haul route between the tract and KFO Route 116 west of Alton. Given that BLM lacks the ability to predict the successful bidder or the potential plans of a successful bidder other than ACD, attempting to guess at other potential short haul routes that may be used by a successful bidder other than ACD would be speculative and, therefore, in this EIS, no consideration is given to these routes. In the event of a competitive lease sale, if the final short haul route differs such that impacts are created that are not addressed here, additional NEPA analysis would be required.

### **2.6.4 Reasonably Foreseeable Coal Loadout Location and Transportation Route**

Future foreseeable transportation of mined coal reserves from the tract to market would be dictated by existing roads and market conditions at the time of sale of mined coal. The applicant (ACD) is currently planning on moving mined coal from the tract to market via development of a rail loadout at Iron Springs, approximately 11 miles west of Cedar City, Utah. To access this loadout, coal transportation would occur via KFO Route 116 continuing north through the town of Alton, north on US-89, west on SR-20, and finally south on I-15 exiting at exit number 59 in Cedar City. For analysis in this EIS, the construction and use of the rail loadout at Iron Springs would be the reasonably foreseeable loadout location associated with the tract, and the approximately 110-mile route would be the reasonably foreseeable transportation route linking the tract and the loadout. Map 2.6 shows the rail loadout location and the transportation route.

If BLM decides to hold a competitive lease sale and a lease is issued to ACD, it is reasonably foreseeable that they would use this rail loadout and transportation route, as conditions dictate, to transport and market the federal coal reserves in the tract. A successful bidder other than ACD may identify a different loadout location, transportation route, or both, to move mined coal from the tract to market. Given that BLM cannot predict the plans of a successful bidder other than ACD, the following would be speculative: attempting to guess at loadout location (or locations), transportation route (or routes), or both, that may be used by a successful bidder other than ACD. Therefore this EIS gives no consideration to other potential loadout locations and transportation routes.

Though transportation of mined coal reserves would not be regulated under the leasing action, all coal haul trucks used for transporting mined coal reserves from the tract would be operated as per federal and Utah Department of Transportation (UDOT) requirements. For analysis of all actions alternatives in this EIS, it is anticipated that in addition to the operation of permitted and regulated haulage from the tract to a reasonably foreseeable rail loadout, the use of best available control measures to minimize and/or eliminate fugitive coal dust along the transportation route would be installed on all coal haul vehicles. Operation of the rail loadout facility would be regulated by DOGM (under their coal regulatory program). In addition to various federal, state, and local regulatory requirements for its operation, it is also anticipated that best available control measures for fugitive coal dust would be implemented at the associated loadout facility.

## **2.7 Alternatives and Options Considered but Eliminated From Detailed Analysis**

The BLM reviewed several potential alternatives and options during the course of alternatives development and following publication of the DEIS. Based on technical, economic, and environmental factors, as well as legal and regulatory constraints, and in light of past, present, and reasonably foreseeable future actions (RFFAs), none of these alternatives or options was carried forward for detailed analysis in this EIS. The rationale for eliminating each alternative (Section 2.7.1) and option (Section 2.7.2) from further analysis is discussed below.

### **2.7.1 Alternatives Considered but Eliminated from Detailed Analysis**

Aside from the Proposed Action, Alternative C, and Alternative K1, 19 alternatives (Alternatives D through V below) were considered during the course of alternatives development and following publication of the DEIS. Each of these was eliminated from detailed analysis in the EIS. Sections 2.7.1.1 through 2.7.1.19 provide descriptions of these alternatives along with the rationale for eliminating each of them from detailed analysis.

### **2.7.1.1 ALTERNATIVE D: ALTON COAL DEVELOPMENT'S ORIGINAL LEASE BY APPLICATION SUBMITTAL**

As indicated in Chapter 1, in November 2004, ACD submitted an LBA (Case Number UTU 081895) to mine federal coal, using primarily surface-mining methods, near the town of Alton, Utah. This LBA submittal contained nearly 2,683 surface acres and approximately 38 million tons of recoverable coal (Map 2.7 shows the original LBA submittal). Due to 1) the identification of additional recoverable coal reserves not included in the LBA, as submitted; 2) additional surface acreage BLM deemed necessary for mine operations; and 3) the need to exclude the Alton cemetery (to comply with regulations under 43 CFR 3461), the BLM reconfigured the tract to include approximately 898 additional surface acres and approximately 11 million additional tons of recoverable coal. The tract as reconfigured is the Proposed Action. Due to reasons as described, ACD's LBA as submitted was not carried forward for detailed analysis. Other tract configurations based on ACD's original LBA submittal were considered to address issues. Each of these was also eliminated from detailed analysis. Descriptions of these alternatives along with the rationale for eliminating each of them from detailed analysis are contained in Sections 2.7.1.8 (Alternative K) and 2.7.1.9 (Alternative L).

### **2.7.1.2 ALTERNATIVE E: NO SURFACE MINING**

An alternative suggested during public scoping identified mining of coal reserves in the tract by use of underground recovery methods. BLM reviewed the feasibility of this alternative and determined that anticipated surface cover (shallow overburden over much of the tract composed largely of unconsolidated material) in the tract would not facilitate this mining method over most of the tract. Furthermore, underground mining methods would significantly reduce the recovery rate of coal in the tract (from approximately 90% to 50%) where shallow overburden facilitates surface-mining methods.

Where overburden exceeds approximately 200 feet, it is anticipated that underground mining methods would be employed to recover in-place coal reserves. Overburden exceeds 200 feet over approximately 613 acres of the tract under all action alternatives. This is the point at which underground mining methods would become more feasible than surface-mining methods, depending on economic conditions. The technical feasibility of underground mining would need to be evaluated at the time that surface mining may no longer be an economic option. Further, by design feature (see Table 2.6.1), surface mining would not be allowed at overburden depths greater than approximately 200 feet.

### **2.7.1.3 ALTERNATIVE F: POSTPONE LEASING DECISION UNTIL COMPLETION OF THE KANAB FIELD OFFICE RESOURCE MANAGEMENT PLAN REVISION**

This alternative was suggested during the public scoping period. The KFO RMP revision was subsequently completed in late 2008. As a result, the suggestion is no longer applicable and has therefore been eliminated from detailed analysis.

### **2.7.1.4 ALTERNATIVE G: POSTPONE LEASING DECISION UNTIL MORE ENVIRONMENTALLY FRIENDLY COAL MINING PRACTICES ARE AVAILABLE**

This alternative is based on the speculative assumption that more environmentally friendly coal mining practices will be developed in the foreseeable future, and that the use of these methods for mining in-place coal reserves contained in the tract would significantly reduce the impacts of mining.

Although more environmentally friendly coal mining techniques and practices may be developed, the timeline for the development of these potential techniques is unknown at this time. To establish a date for postponement of a competitive lease sale would therefore be speculative and the chosen date would be arbitrary. Furthermore, the degree to which potentially more environmentally friendly mining techniques would reduce impacts is not known because these mining methods have not been developed, or even proposed. To assume that more environmentally friendly mining methods would significantly reduce the impacts of mining coal from the tract would also be speculative.

#### **2.7.1.5 ALTERNATIVE H: CONSTRUCT A COAL-FIRED POWER PLANT NEXT TO THE TRACT**

An alternative suggested during the public scoping period identified the construction of a coal-fired power plant next to the tract as a way to eliminate impacts due to the transportation of coal resources from the tract to market. This alternative would not meet the purpose and need (see Section 1.2) for the Proposed Action and alternatives and was therefore eliminated from detailed analysis in this EIS. A coal lease obtained from the BLM makes coal available for leasing but does not place constraints on its ultimate use or the location of that use. Further, considering approval of the construction and operation of a coal-fired power plant next to the tract would be outside of the framework established for this EIS when ACD submitted the Alton Coal Tract LBA to lease and mine federal coal reserves. ACD's application does not include a proposal to construct or operate a coal-fired power plant as a part of their proposal to lease and mine federal coal reserves.

Also, the total environmental impacts of Alternative H would be greater than the impacts of transportation of coal from the tract to the reasonably foreseeable rail loadout facility. This is particularly true because coal-fired power plants generally require more coal on a yearly basis than would be produced from the tract, which would likely mean that additional coal would need to be transported to the area.

#### **2.7.1.6 ALTERNATIVE I: PROMOTE THE DEVELOPMENT OF ALTERNATIVE SOURCES OF ENERGY, NATURAL GAS, AND ENERGY CONSERVATION**

Under this proposed alternative, the BLM would choose not to offer the tract for competitive leasing. Instead, the BLM would promote energy conservation, the use of natural gas, and the development of alternative sources of energy, such as wind, solar, and geothermal on lands contained in the tract as well as elsewhere in the KFO. This alternative does not meet the purpose and need (see Section 1.2) for the Proposed Action and alternatives and was therefore eliminated from detailed analysis in this EIS. In a similar manner as considering the construction of a coal-fired power plant next to the tract, foregoing coal leasing in favor of promoting energy conservation, the use of natural gas, and the development of alternative sources of energy would be outside the framework established for this EIS when ACD submitted their LBA to lease and mine federal coal reserves in the tract. ACD's application did not include a proposal to promote energy conservation and/or the use of natural gas and/or to develop alternative sources of energy on the LBA tract or elsewhere in the KFO. A primary goal of the Energy Policy Act is to add energy supplies from diverse sources. If an alternative energy proposal were received, a separate NEPA analysis would be conducted.

#### **2.7.1.7 ALTERNATIVE J: COAL TRANSPORTATION ALTERNATIVES**

During the public scoping period, one reasonably foreseeable transportation route was presented to the public (Iron Springs rail loadout via US-89, SR-20, and I-15; see Map 2.6 and Section 2.6.4 for a map and description, respectively). Due to concerns regarding transportation impacts along this route, several transportation alternatives were suggested. The BLM considered these alternatives and eliminated them from detailed analysis for the reasons outlined in the bulleted list below.

## 2.7 Alternatives and Options Considered but Eliminated From Detailed Analysis

- Due to operations at the Coal Hollow Mine adjacent to the tract, approximately 153 coal truck round-trips would already be taking place on existing area roads and highways. Approval of the lease and mining on the tract would not result in new traffic impacts but would extend the life over which these impacts occur.
- Decisions regarding the transportation of coal from the tract to market are dictated by market conditions and the intended use of the coal resource at the time of mining and sale of coal. Limiting the ability of the successful bidder to efficiently deliver coal resources to market would not fully meet the purpose and need for the Proposed Action and alternatives because leasing and mining the coal is intended to meet market needs wherever they occur.
- Coal trucks and loads used by the successful bidder would be required to meet state and federal guidelines and regulations. Coal trucks would be legally permitted to use any road or highway not already restricted from truck traffic. Any decision to limit or curtail the use of these roads by trucks (coal trucks or otherwise) is regulated by Kane, Garfield, and Iron counties and UDOT, and it is outside the scope of this EIS and the BLM's jurisdiction.

A decision to lease on the part of the BLM would not approve any particular transportation route. This EIS presents an analysis of reasonably foreseeable impacts from reasonably foreseeable activities to meet NEPA hard-look disclosure requirements. The elimination of transportation alternatives from detailed analysis in this EIS does not mean that transportation impacts are not addressed. These impacts are addressed in detail in Chapter 4, Environmental Consequences.

During the public scoping period, transportation of coal by a conveyor was also suggested. The BLM eliminated each of these alternatives from detailed analysis because they are not reasonable for the following reasons: 1) the volume of coal to be recovered from this LBA tract would not justify the large expenditures to implement either of these alternatives; 2) construction and operation of slurry lines or a large conveyor system would disturb more acreage, create more visual intrusion, and result in an overall increase in environmental consequences as compared to trucking of coal (with minor exceptions, most of the roads for trucking coal are already in place); and 3) slurry lines and conveyor systems are difficult to move once constructed, their construction as an alternative to any potential trucking routes would require that customers for the mined coal be identified prior to the conclusion of the EIS process, including putting agreements in place to ensure that markets identified now would continue to be viable at the completion of the EIS process.

#### **2.7.1.8 ALTERNATIVE K2: TRACT MODIFICATIONS TO ADDRESS CONCERNS RELATED TO GREATER SAGE-GROUSE AND BIG GAME**

During the public scoping period, impacts to sage-grouse and big game were expressed as concerns. To address these concerns, BLM considered alternatives to the Proposed Action that removed portions of the tract known to be used by the local sage-grouse population according to recently collected radio collar data. Alternative K2 would remove a small portion of Block NW and another small portion of Block S from the tract (Map 2.8). Both of the blocks eliminated under Alternative K2 are in the no-coal zone. This alternative would also place timing restrictions on mining operations conducted by the successful bidder (no ground surface disturbance in Block NW and Block S from March 15 to July 15 and no ground surface disturbance within 0.5 mile of the existing, nearby lek during the lekking period, February 15 to March 15). To address big game concerns, the BLM considered requiring the successful bidder to leave buffers between forage and cover wherever possible.

The tract configuration as described under Alternative K2 was not carried forward for detailed analysis in the EIS primarily because it does not represent a meaningful change from the tract configuration under the Proposed Action. The tract configuration under Alternative K2 would only be reduced by

approximately 241 acres (7%) compared to the Proposed Action. Also, projected total surface disturbance under Alternative K2 would be approximately 17 acres (0.7%) less than that projected under the Proposed Action. Further, Block S is a good candidate for proposed on-site mitigation measures for sage-grouse and other sagebrush-dependent species, and it makes more sense to retain this block under all alternatives for this purpose than to eliminate it. Except for those restrictions that would also apply to Block NW, surface disturbance timing restrictions described under this alternative were carried forward for detailed analysis as part of Alternative C (see Section 2.4). Also, Alternative K1, which would eliminate Block NW and Block S from the tract and be more protective of sage-grouse and other sagebrush-dependent species than Alternative K2, is analyzed in detail as part of this SDEIS.

To address concerns related to impacts to big game and big game habitat, BLM considered a requirement that the successful bidder leave buffers between big game forage and cover wherever possible. This alternative was eliminated from detailed analysis because it would have limited utility given the large range used by big game, because similar habitat exists in substantial acreages adjacent to the tract, and because of the likelihood that these buffers would not be used by big game in such close proximity to mining operations. Further, this is not an enforceable or measurable requirement. The BLM cannot provide meaningful analysis of the effectiveness of this type of measure because there are no data available upon which to draw reasonable conclusions.

#### **2.7.1.9 ALTERNATIVE L: TRACT MODIFICATIONS TO ADDRESS CONCERNS RELATED TO KANAB CREEK, POSSIBLE ALLUVIAL VALLEY FLOORS, AND OTHER WATER FEATURES**

During the alternatives development process, alternatives intended to reduce potential impacts to Kanab Creek and possible AVFs were considered. One alternative (Alternative L1) would require the successful bidder to mine the central-west portion of the tract (Blocks CWN and CWS) from west to east and to remove from the tract that portion of the tract in the no-coal zone to the east of these two blocks (Map 2.9). Another alternative (Alternative L2) would remove the central-west portion (Blocks CWN and CWS, including the no-coal zone) from the tract altogether (Map 2.10). Neither of these alternatives is carried forward for detailed analysis in the EIS.

First, neither alternative would provide a benefit to water quality that would be substantially greater than the water quality protection measures already required by law and regulation. Further, Alternative L1 would create more impact than the Proposed Action or Alternative C by requiring that light-use roads be routed in the LBA around the central portion (no-coal zone) of the tract rather than across this area, therefore increasing the length of the road and not eliminating road stream crossings (either way one to two road stream crossings would be required). Additionally, Alternative L2 would likely result in the bypass of the coal contained in Block CWS (and perhaps CWN as well) because this coal would become isolated and is not anticipated to be present in quantities great enough (approximately 1,900,000 tons and 1,200,000 tons for Block CWS and CWN, respectively) to be economically recoverable as a separate, stand-alone lease tract.

Comments on the DEIS suggested that the BLM analyze an alternative that completely avoids impacts to water resources on the entire tract. This alternative was not carried forward for detailed analysis. First, based on the analysis of the existing alternatives (Alternatives A, B, C, and K1), it is in the BLM's decision space to exclude, in its ROD, portions of the tract to avoid or reduce impacts to water features. Second, there are no reasonable stand-alone action alternatives that avoid impacts to all or most water resources that are not already analyzed in detail in Alternative C and Alternative K1. Finally, the No Action Alternative, which completely avoids impacts to water resources on the entire tract, is already analyzed in detail.

### **2.7.1.10 ALTERNATIVE M: MAXIMIZE FLEXIBILITY OF MINING OPERATIONS**

Under this proposed alternative, the tract configuration and preliminary mine plan would be the same as under the Proposed Action. However, no avoidance criteria (outside of that required by existing law and regulations) would be in place for siting of centralized or dispersed facilities, and the successful bidder would be allowed to disturb (pit disturbance) up to 360 acres of land prior to beginning reclamation activities. The purpose of this alternative was to maximize flexibility in mining operations for the successful bidder and, therefore, to increase maximum economic recovery of the coal resource. This alternative was eliminated from detailed analysis in the EIS because it did not provide a more comprehensive benefit than the Proposed Action in terms of meeting purpose and need. In other words, this alternative would result in more adverse impacts than the Proposed Action without resulting in a substantial increase in the likely maximum economic recovery of the coal resource.

### **2.7.1.11 ALTERNATIVE N: NITROGEN DIOXIDE EMISSIONS CONTROL MEASURES**

Comments provided during the scoping period suggested that BLM should consider measures to ensure that unsafe levels of NO<sub>2</sub>, which may be emitted as a result of blasting and engine exhaust, are not released to the environment. During the alternatives development process, BLM considered including NO<sub>2</sub> control measures in one or more alternatives. However, due to measures already required by existing laws and regulations (see Table 2.5.1) to control NO<sub>2</sub> emissions, BLM did not carry any of these alternatives forward for detailed analysis. Emission control measures for NO<sub>2</sub> provided under any alternative would not provide a substantially greater benefit in terms of preventing NO<sub>2</sub> emissions than preventative measures already required.

### **2.7.1.12 ALTERNATIVE O: RESTRICT MINING OPERATIONS TO DAYLIGHT HOURS**

To eliminate the potential for skyglow and impacts to the quality of night skies near the tract, BLM considered an alternative that would restrict mining activities to daylight hours only. This alternative was not carried forward for detailed analysis because it does not conform to standard industry operating practices for mining activities (coal or otherwise). In the United States, there are no known mines restricted by federal, state, or other agencies to operate only during daylight hours. Likewise, there are no known mines in the United States voluntarily operating during daylight hours, only perhaps with the exception of operations with fewer than five employees that may be operating during daylight hours only for convenience or to avoid the added capital cost of night operations. Further, in terms of reduced skyglow and quality of night skies near the tract, the benefits of this alternative as compared to allowing nighttime operations would be limited because lighting requirements for nighttime mining operations would already be limited in nature (see Section 2.3.2.5), and minimization measures would be required, as described in Table 2.6.1 and Section 4.2. Finally, a daylight operations-only alternative is not needed to reduce or eliminate impacts to other resources and uses because these conflicts can be addressed by other alternatives that are analyzed in detail and/or by lease stipulations; compliance with federal, state, or local laws; and the application of mitigation measures that the BLM may adopt in its decision.

### **2.7.1.13 ALTERNATIVE P: UPDATE THE KFO RMP UNSUITABILITY DETERMINATIONS BASED ON THE ANALYSIS IN THE DEIS AND RECONFIGURE THE TRACT TO EXCLUDE THESE AREAS**

Comments on the DEIS requested that the impacts analysis contained in the DEIS be used to update the KFO RMP's coal unsuitability determinations for the area (particularly with respect to Criteria 2, 3, 15, 18, and 19), and that an alternative be created that is in conformance with these updated coal unsuitability results. The development of an additional alternative was not necessary in response to this comment. The

*Final Coal Unsuitability Report* in the 2008 KFO RMP indicates that unsuitability determinations for Criteria 2, 3, 15, 18, and 19 would be made at the time of lease analysis (see Appendix D). Consistent with that direction and the applicable regulations, these determinations have been made in Section 1.7.1.2.2. This updated determination does not require an update to the coal unsuitability determinations in the KFO RMP as project-specific assessments were contemplated by the RMP and the regulations. Additionally, as explained in Section 1.7, a finding of unsuitability under Criterion 15 does not by necessity prohibit leasing because “[a] lease may be issued if, after consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected” (43 CFR 3461.5(o)(1)).

#### **2.7.1.14 ALTERNATIVE Q: AIR QUALITY PROTECTION ALTERNATIVE**

Comments on the DEIS requested that the BLM develop an alternative that ensures no violations of Clean Air Act (CAA) standards. An alternative specifically aimed at ensuring no violations of CAA standards was not considered for detailed analysis because it is unnecessary. The modeling analysis shows that the application of design features and mitigation measures as described in Sections 4.3.1, 4.3.5, and Table 2.6.1 would ensure that violations of air quality standards would not occur under any action alternative. An alternative aimed specifically at ensuring that no violations of air quality standards occur would not address unresolved resource conflicts, because no air quality conflict exists that cannot be addressed by means other than stand-alone alternatives.

#### **2.7.1.15 ALTERNATIVE R: RESTRICT COAL TRUCK TRAFFIC AFTER SUNSET AND BEFORE SUNRISE**

Comments on the DEIS requested that the BLM consider an alternative to restrict coal truck traffic for the first two to three hours after sunset and the first two to three hours before sunrise to improve highway safety and decrease the risk of collisions with wildlife. This is considered as a potential mitigation measure in Sections 4.17.6 of this SDEIS rather than as a stand-alone alternative. However, at this time, the BLM does not have the authority to restrict the successful lessee’s access to area highways for purposes of transporting coal mined from the tract.

#### **2.7.1.16 ALTERNATIVE S: RECONFIGURE THE TRACT TO EXCLUDE CULTURAL RESOURCES SITES ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES**

Comments on the DEIS requested that the BLM reconfigure the tract to exclude cultural resources sites eligible for the NRHP. It is within the BLM’s decision space as a result of the analysis of impacts of the existing alternatives to choose to avoid impacts to some or all cultural resources on the tract and/or to ameliorate some or all impacts through mitigation measures. As a result, there is no need for an alternative that is designed specifically to avoid impacts to cultural resources. Further, the programmatic agreement developed with consulting parties addresses how impacts to cultural resources would be dealt with if the BLM decides to offer the tract for competitive leasing.

#### **2.7.1.17 ALTERNATIVE T: SEASONAL TIMING RESTRICTIONS AND VARYING BUFFER-SIZE RESTRICTIONS FOR THE TRACT**

Comments on the DEIS requested that the BLM consider employing seasonal timing restrictions on the entire tract under all alternatives rather than just under Alternative C, with the primary intent of decreasing impacts to Greater Sage-Grouse and avoiding impacts to night sky viewers during the prime night-sky viewing season. This alternative was considered but eliminated from detailed analysis because it would result in the prohibition of all mining activities on the tract for approximately two to four months

## 2.7 Alternatives and Options Considered but Eliminated From Detailed Analysis

per year (or more). Suspending mining activities on the tract for this length of time on an annual basis does not conform to reasonable, standard industry operating practices for mining activities (coal or otherwise). In the United States, there are no known mines restricted by federal, state, or other agencies to operate only seasonally with as much as four months per year without mining. Likewise, there are no known mines in the United States voluntarily operating only seasonally, perhaps with the exception of small operations that operate only seasonally for convenience. Also, based on the alternatives analyzed in detail, it is within the BLM's decision space to apply seasonal timing restrictions to other tract configurations without considering those as stand-alone alternatives, because this would be within the range of impacts already analyzed based on the action alternatives carried forward for detailed analysis.

Concerns have also been expressed regarding the size of the buffer around the Greater Sage-Grouse lek near the tract. Alternative C has seasonal restrictions within 0.5 mile of the lek during the sage-grouse nesting and brooding period. Under Alternative K1, there would be no mining at any time of the year within 0.5 mile of the lek. It has been shown that a 0.5-mile buffer is not sufficient to protect sage-grouse nesting habitat (Walker et al. 2007). A range of larger buffer sizes has been suggested, including a 1-mile buffer, a 2-mile buffer, and greater-than-2-mile buffer. It has also been suggested that seasonal restrictions on mining within the buffer should be replaced with permanent restrictions (i.e., reconfiguring the tract to exclude the portion within the buffer from the tract). However, a 1-mile buffer is already being analyzed in the EIS because Alternative C essentially represents a 1-mile seasonal buffer, and a buffer greater than 1 mile would make mining operations on the tract economically unviable.

Alternative C includes seasonal restrictions on mining activities in Block S during the sage-grouse's nesting and brooding period (March 15–July 15). This includes nearly all the coal resources within 1 mile of the lek. Alternative C also allows two pits to be open at any one time with significant initial costs. Thus, the EIS is essentially already considering an alternative that seasonally restricts mining within a 1-mile buffer of the lek, while allowing mining operations to take place in another area of the tract.

Requiring a 2-mile buffer around the lek would restrict mining on the entire tract except Block NW. A 3- or 4-mile buffer would encompass the entire tract. Prohibiting mining activities altogether within these buffers would make mining the tract economically unviable because nearly the entire tract would be off limits when using a 2-mile buffer and the entire tract would be off limits when using a 3- or 4-mile buffer. Suspending mining operations on the entire tract or nearly the entire tract for four or five months every year would also make mining the tract economically unviable and result in significant negative economic impacts to employees and the communities. This is because of the substantial expense of shutting down and then restarting operations every year. These costs would result from the three factors listed below:

- Capital cost per ton of coal sold would increase dramatically due to decreased production or the additional capital equipment that must be acquired to produce the same tonnage in fewer months.
- The operator would have increased labor costs to lay off, hire, and train or retrain personnel.
- The operator would incur added operating costs to rehabilitate roadways and pits after sitting idle without maintenance for an extended period, which would increase the nonproductive time from two weeks to two or more months depending on the weather conditions during the idle period.

It might be possible to expand the acreage of disturbed lands outside the buffer areas throughout the life of the mine to provide other locations for production during the seasonal restrictions. However, a detailed evaluation of the mining plans would be required to determine if this would be feasible. Detailed mining plans would not be available until the permitting stage. This approach may also be economically unviable because maintaining additional open mine pits for alternative production would add substantial operating costs. A noneconomic cost of this approach would be that the additional open mine pits would be additional surface disturbance that would remain open until reclamation.

Although the financial implications of the restrictions described above could be specifically quantified with significant effort, operators generally would not have sufficient operating margins to withstand the substantial added costs. Because it would not be economically feasible to prohibit mining on most of the tract permanently or seasonally, this alternative was not carried forward for detailed analysis.

### **2.7.1.18 ALTERNATIVE U: ALTERNATIVE LOCATIONS**

Comments on the DEIS suggested that the BLM consider alternative locations for leasing rather than the Alton Coal Tract under consideration in Alternatives B, C, and K1. This alternative was not carried forward for detailed analysis because it would not meet the BLM's purpose and need, which is specifically associated with responding to the LBA submitted by ACD. Other locations may be considered by the BLM as a part of responding to other LBAs submitted for those locations. Separate NEPA processes would be needed to respond to the LBAs for those locations.

### **2.7.1.19 ALTERNATIVE V: LEASE ALL KNOWN RECOVERABLE COAL RESOURCES**

Comments on the DEIS suggested that the BLM consider leasing all known recoverable coal resources rather than only those under consideration in Alternatives B, C, and K1. This alternative was not carried forward for detailed analysis because, much like Alternative U, it would not meet the BLM's purpose and need, which is specifically associated with responding to the LBA submitted by ACD. All known recoverable coal resources are available for leasing unless specifically considered unsuitable for surface mining and/or surface impacts from underground mining. However, at this time, the BLM has not received LBAs for all known recoverable coal resources that are considered suitable. Further, the total acreage of all known recoverable coal resources is too large to be developed in an efficient, economical, and orderly manner as a unit.

## ***2.7.2 Options Considered but Eliminated from Detailed Analysis***

Certain components of the federal action would be independent of the elements of any alternative. In the EIS, these were considered options, any one of which could be chosen in combination with any alternative and would not necessitate changes in the alternative, or vice versa. Those options that were considered but not carried forward for detailed analysis are described below.

### **2.7.2.1 KANAB FIELD OFFICE ROUTE 116 RELOCATION OPTIONS**

Under SMCRA, the approval of surface-mining operations on lands within 100 feet of the outside line of the ROW for a public road requires a process resulting in a final decision by DOGM or the public road authority. At this juncture the coal underlying KFO Route 116, and underlying a buffer zone extending 100 feet on either side of the outer edges of the road, is currently considered unsuitable for mining. However, this EIS analysis assumes that an agreement to relocate the road would be reached. During the alternatives development process, several options for addressing SMCRA requirements with respect to KFO Route 116 were considered. These included the following:

- Option A: Permanently rerouting KFO Route 116 around (outside) the tract on adjacent lands
- Option B: Permanently closing KFO Route 116 without establishing an alternate, replacement route
- Option C: Closing KFO Route 116 for the duration of mining activity and reestablishing the road in its original (current) roadbed following mining activity

These options were eliminated from detailed analysis in the EIS for one or more of the following reasons: 1) Kane County would not agree to the proposed option; 2) the proposed option would result in more

impacts than KFO Route 116 relocation options being considered for detailed analysis in the alternatives, without providing substantially greater benefit; 3) the proposed option would permanently or for a substantial period of time (the life of the mine) cut off access to private lands, public rangelands, or both; and 4) SMCRA would not allow the option if it were chosen.

### 2.7.2.2 OTHER ROADS IN THE TRACT

In addition to KFO Route 116, roads on private land and on BLM-administered land exist in the tract (see list in Section 2.6.2). The BLM considered permanently closing roads on BLM-administered land. However, such closures would permanently restrict access to these lands by permittees and would eliminate roads used for recreation. Given the current frequent use of these roads by these users (especially permittees), BLM could not justify permanent closure. Further, some of the roads that would be closed under this option would restrict access of private landowners to their private surface estates.

### 2.7.2.3 POWER GENERATION OPTIONS

Approximately 2–3 mW of electrical energy output would be required at any one time for mining operations on the tract under the Proposed Action, Alternative C, or Alternative K1 (see Section 2.3.2.6). In addition to the use of diesel-powered generators to supply this energy, which is considered in detail, supplying power via a transmission line (three possible points of origin) or a combination of diesel-powered generators and a transmission line was considered. Transmission line options considered were as follows:

- Option A: Creating a transmission line extension from US-89 at the junction with KFO Route 116 near the town of Alton to the tract
- Option B: Creating a transmission line extension from Kanab to the tract
- Option C: Creating a transmission line extension from Todd's Junction in Garfield County to the tract

Option A was not carried forward for further analysis because this transmission line extension would only be able to supply the mine operation with approximately 500 kilowatts of energy, approximately 17%–25% of the power needed to operate the mine. Under this scenario, the successful bidder would need to use generators to meet the remaining energy needs (75%–83%) of the mine. The quantity of electrical energy that could be supplied under this option would not justify the cost of investing in construction of the transmission line given the need to continually use diesel-powered generators to supply most of the energy.

Option B was not carried forward for further analysis due to the high cost of transmission line construction (\$15,000,000–\$20,000,000, according to estimates provided by Garkane Energy), and the fact that this option would only provide approximately 1 mW of energy for mining operations (approximately 33%–50% of the power needed to operate the mine). According to estimates provided by ACD, the cost of transmission line construction would never be paid back over the life of the mine; conducting mining operations solely with the use of diesel-powered generators is estimated to be cheaper over the life of the mine than transmission line construction. Also, under this option, the successful bidder would still need to use diesel-powered generators to supply 50%–67% of the energy required for mining operations.

The reasonably foreseeable Garkane Energy 138-kilovolt transmission line between Tropic and Hatch would create an opportunity to supply power to the mining operation via a transmission line originating at Todd's Junction (Option C). According to estimates provided by Garkane Energy, this transmission line would be able to supply 2–3 mW of energy to the tract, and the cost of transmission line construction would be a fraction of that under Option B. This option would be viable assuming that 1) the successful bidder, in coordination with Garkane Energy, could obtain ROWs across all private land, as necessary, between Todd's Junction and the tract in a timely fashion (or at all) and 2) Garkane Energy could guarantee that 2–3 mW of energy would be supplied to the tract for the projected life of the mine. If either

one of the aforementioned assumptions is violated, this option would no longer be viable. For this reason, it would be speculative to consider this as an option in this EIS, and it was therefore eliminated from detailed analysis.

## 2.8 Comparison of Alternatives

The following tables (Table 2.8.1 and Table 2.8.2) compare the No Action Alternative, Proposed Action, Alternative C, and Alternative K1. Table 2.8.1 contains a summary comparison of the alternatives and Table 2.8.2 contains a summary comparison of direct and indirect impacts. The tables are presented to give a concise summary of the alternatives in a comparative form. The environmental consequences are fully analyzed in Chapter 4, Environmental Consequences. Under NEPA, all federal agencies are required to provide a detailed statement on

- the direct and indirect environmental impacts of the Proposed Action and alternatives to the Proposed Action, including the No Action Alternative;
- any adverse environmental impacts that cannot be avoided;
- the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity;
- any irreversible and irretrievable commitments of resources; and
- the cumulative impacts of the action, when added to other past, present, and RFFAs.

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**Table 2.8.1. Summary Comparison of Alternatives**

Item	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
Recoverable coal reserves (short tons) <sup>†</sup>	0	44,900,000	39,200,000	30,800,000
Federal mineral lease (acres) <sup>†</sup>	3,581	3,581	3,178	2,114
Private surface lease (acres) <sup>‡</sup>	1,296	1,296	893	880
Federal surface lease (acres)	2,280	2,280	2,280	1,235
Projected annual coal production (short tons)	0	2,000,000	2,000,000	2,000,000
Projected life of the mine (years)	0	25	21	16
Projected surface disturbance from pits (acres)	0	1,750	1,454	869
Projected surface disturbance from centralized facilities (acres)	0	36	36	36
Projected surface disturbance from dispersed facilities (acres)	0	160	135	92
Projected surface disturbance from KFO Route 116 relocation	0	47 (17 actual road + 30 ROW)	37 (13 actual road + 24 ROW)	16
Total projected surface disturbance (acres)	0	1,993	1,662	1,012
Projected surface disturbance during active mining (acres/number of pits) <sup>§</sup>	0	120/1	240/2	120/1
Projected permanent disturbance from EODA (acres/number of EODAs)	0	0/0 <sup>¶</sup>	40–60/1	0/0
Projected area of underground mining and surface impacts due to subsidence (acres) <sup>**</sup> , <sup>x</sup>	0	613 (+166 outside the tract)	613 (+166 outside the tract)	613 (+166 outside the tract)
Projected annual water use (gallons)	0	8,112,000	8,112,000	8,112,000
Projected power needs (mW) and method of delivery	0	2–3 diesel-powered generators	2–3 diesel-powered generators	2–3 diesel-powered generators
Normal operating hours (hours/days per week/days per year)	0/0/0	24/5–7/260–365	24/5–7/260–365	24/5–7/260–365
Projected number of employees	0	160	160	160
Projected truck traffic (truck round-trips per day between the tract and the loadout location)	0	153	153	153
Special timing restrictions in place for Block S	n/a	None	February 15–March 15 (lekking); March 15–July 15 (nesting/brooding)	None

<sup>†</sup> Under the No Action Alternative, coal present (approximately 59,600,000 tons) would not be mined, and therefore these coal resources would not represent coal reserves.

<sup>‡</sup> Federal mineral lease acres represent the total acres present in the tract whether or not they are leased. Private surface and federal surface acres do not add to total federal mineral lease acres due to errors explained in Table 2.3.1.

<sup>§</sup> Private surface lease acres represent the total private surface acres present in the tract whether or not they would be leased.

<sup>¶</sup> This refers to areas with open surface-mining pits from which coal is being removed and/or areas where topsoil and/or overburden is being removed.

<sup>\*\*</sup> If BLM decides to hold a competitive lease sale for the tract under the Proposed Action, and there is a successful bidder other than ACD, one EODA would be required under this alternative.

<sup>x</sup> The projected area of underground mining operations is calculated as the approximate location where underground coal recovery would begin to the tract boundary.

<sup>\*\*</sup> See Chapter 4 Section 4.6 Geology and Minerals for a further explanation of surface impacts due to subsidence.

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Impacts can be beneficial or adverse, and can be a primary result of an action (direct) or a secondary result (indirect). They can be permanent (irreversible), long term (occurring or remaining after the cessation of coal mining and during, or continuing, into the period following the reclamation and monitoring period), or short term (the period when the development of the mine and the mining of coal would occur). The level of impacts may also vary. The basis for conclusions regarding significance are the criteria set forth by the CEQ (40 CFR 1508.27) and the professional judgment of the specialists doing the analyses. Impacts can be significant during mining but be reduced to less-than-significant levels following completion of reclamation or mitigation. Definitions of the magnitude of impacts associated with the No Action Alternative, the Proposed Action, Alternative C, and Alternative K1 are presented, as appropriate, in Chapter 4, Environmental Consequences. A summary of impacts is provided in Table 2.8.2.

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**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
4.2	<b>Aesthetic Resources: Noise</b>	No impacts to aesthetic resources (noise) would occur under the No Action Alternative.	Vibration impacts and increased ambient noise levels in and near the tract and along the coal haul transportation route would occur for the life of the mine (25 years) under the Proposed Action.	Vibration impacts and increased ambient noise levels in and near the tract and along the coal haul transportation route would occur for the life of the mine, except that under Alternative C, the noise associated with mining would be located further from the town of Alton and the life of the mine would be 21 years.	Vibration impacts and increased ambient noise and vibration levels in and near the tract and along the coal haul transportation route would occur for the life of the mine, except that under Alternative K1, the noise associated with mining would be located further from the town of Alton, and the life of the mine would be 16 years.
	<b>Aesthetic Resources: Visual Resources</b>	No impacts to aesthetic resources (visual) would occur under the No Action Alternative.	Under the Proposed Action, short-term modifications would occur to the basic elements of form, line, color, and texture from surface-mining disturbances and presence of facilities. If the 120-acre tracks of coal are removed and rehabilitated, the existing character of the landscape would be gradually restored. The level of change to the landscape would be consistent with visual resource management Class IV objectives.	Under Alternative C, impacts would be the same as those described under the Proposed Action, except that a greater acreage of visual contrasts at any one time would result during mining operations, fewer total acres would be disturbed, mining would be located further from the town of Alton, and the life of the mine would be 21 years.	Under Alternative K1, impacts would be the same as those described under the Proposed Action, except that fewer total acres would be disturbed, mining would be located further from the town of Alton, and the life of the mine would be 16 years.
	<b>Aesthetic Resources: Night Sky</b>	No impacts to aesthetic resources (night sky) would occur under the No Action Alternative.	There would be a perceptible increase in nighttime skyglow from artificial lighting used during mining operations under the Proposed Action. This effect would persist for 25 years. Potential skyglow visible from Yovimpa Point within Bryce Canyon National Park would be less than that produced by several small towns in the general area. Additionally, potential skyglow visible from Brian Head Peak outside of Cedar Breaks National Monument would be much less than skyglow produced by St. George and Cedar City, Utah.	Under Alternative C, impacts would be the same as those described under the Proposed Action, except that the effect would persist for 21 years.	Under Alternative K1, impacts would be the same as those described under the Proposed Action, except that the effect would persist for 16 years.
4.3	<b>Air Resources: PM<sub>10</sub></b>	Under the No Action Alternative, no impacts with respect to PM <sub>10</sub> would occur as a function of mining. Existing and future emissions sources would result in concentrations of PM <sub>10</sub> within the NAAQS.	Under the Proposed Action, existing and future emissions sources would result in concentrations of PM <sub>10</sub> within the NAAQS.	Under Alternative C, existing and future emissions sources may result in concentrations of PM <sub>10</sub> exceeding the NAAQS.	Under Alternative K1, existing and future emissions sources would result in concentrations of PM <sub>10</sub> within the NAAQS.
	<b>Air Resources: PM<sub>2.5</sub></b>	Under the No Action Alternative, no impacts with respect to PM <sub>2.5</sub> would occur as a function of mining. Existing and future emissions sources would result in concentrations of PM <sub>2.5</sub> within the NAAQS.	Under the Proposed Action, existing and future emissions sources would result in concentrations of PM <sub>2.5</sub> within the NAAQS.	Under Alternative C, existing and future emissions sources would result in concentrations of PM <sub>2.5</sub> within the NAAQS.	Under Alternative K1, existing and future emissions sources would result in concentrations of PM <sub>2.5</sub> within the NAAQS.
	<b>Air Resources: NO<sub>2</sub></b>	Under the No Action Alternative, no impacts with respect to NO <sub>2</sub> would occur as a function of mining. Existing and future emissions sources would result in concentrations of NO <sub>2</sub> within the NAAQS.	Under the Proposed Action, existing and future emissions sources would result in concentrations of NO <sub>2</sub> within the NAAQS.	Under Alternative C, existing and future emissions sources would result in concentrations of NO <sub>2</sub> within the NAAQS.	Under Alternative K1, existing and future emissions sources would result in concentrations of NO <sub>2</sub> within the NAAQS.
	<b>Air Resources: Volatile organic compounds</b>	Under the No Action Alternative, no impacts with respect to volatile organic compound (VOCs) would occur as a function of mining. Existing and future emissions sources would continue to have impacts.	Under the Proposed Action, VOC emissions would be small compared to regional sources. Impacts with respect to VOCs would be well within regulatory limits.	Under Alternative C, VOC emissions would be small compared to regional sources. Impacts with respect to VOCs would be well within regulatory limits.	Under Alternative K1, VOC emissions would be small compared to regional sources. Impacts with respect to VOCs would be well within regulatory limits.
	<b>Air Resources: CO</b>	Under the No Action Alternative, no impacts with respect to CO would occur as a function of mining. Existing and future emissions sources would result in concentrations of CO within the NAAQS.	Under the Proposed Action, existing and future emissions sources would result in concentrations of CO within the NAAQS.	Under Alternative C, existing and future emissions sources would result in concentrations of CO within the NAAQS.	Under Alternative K1, existing and future emissions sources would result in concentrations of CO within the NAAQS.
	<b>Air Resources: SO<sub>2</sub></b>	Under the No Action Alternative, no impacts with respect to SO <sub>2</sub> would occur as a function of mining. Existing and future emissions sources would result in concentrations of SO <sub>2</sub> within the NAAQS.	Under the Proposed Action, existing and future emissions sources would result in concentrations of SO <sub>2</sub> within the NAAQS.	Under Alternative C, existing and future emissions sources would result in concentrations of SO <sub>2</sub> within the NAAQS.	Under Alternative K1, existing and future emissions sources would result in concentrations of SO <sub>2</sub> within the NAAQS.
	<b>Air Resources: CO<sub>2</sub></b>	Under the No Action Alternative, no impacts with respect to CO <sub>2</sub> would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to CO <sub>2</sub> .	Under the Proposed Action, impacts with respect to CO <sub>2</sub> would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to CO <sub>2</sub> .	Under Alternative C, impacts with respect to CO <sub>2</sub> would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to CO <sub>2</sub> .	Under Alternative K1, impacts with respect to CO <sub>2</sub> would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to CO <sub>2</sub> .

**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
	<b>Air Resources: Hazardous air pollutants (benzene, toluene, xylenes, formaldehyde, acetaldehyde, and acrolein)</b>	Under the No Action Alternative, no impacts with respect to HAPs would occur as a function of mining. Existing and future emissions sources would continue to have impacts.	Under the Proposed Action, the potential emissions of HAPs would be well below threshold exposure levels. No adverse impacts are anticipated.	Under Alternative C, the potential emissions of HAPs would be well below threshold exposure levels. No adverse impacts are anticipated.	Under Alternative K1, the potential emissions of HAPs would be well below threshold exposure levels. No adverse impacts are anticipated.
	<b>Air Resources: Near-field Visibility</b>	Under the No Action Alternative, no impacts with respect to visibility would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to visibility.	Under the Proposed Action, the maximum impacts inside of Bryce Canyon National Park from a potential mine plume would be less than the VISCREEN acceptance criteria for both color change (Delta E) and contrast.	Under Alternative C, the maximum impacts inside of Bryce Canyon National Park from a potential mine plume would be less than the VISCREEN acceptance criteria for both color change (Delta E) and contrast.	Under Alternative K1, the maximum impacts inside of Bryce Canyon National Park from a potential mine plume would be less than the VISCREEN acceptance criteria for both color change (Delta E) and contrast.
	<b>Air Resources: Far-field Visibility</b>	Under the No Action Alternative, no impacts with respect to visibility would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to visibility.	Under the Proposed Action, there are no extinction changes exceeding 10% in any of the Class I/Class II areas. Zion National Park has three extinction changes that exceed 5%.	Under Alternative C, there are no extinction changes exceeding 10% in any of the Class I/Class II areas. Zion National Park has three extinction changes that exceed 5%.	Under Alternative K1, impacts would be equal to or less than those from the Proposed Action.
	<b>Air Resources: Deposition</b>	Under the No Action Alternative, no impacts with respect to deposition would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to deposition.	Under the Proposed Action, impacts for sulfur and nitrogen deposition are below the deposition analysis thresholds (DATs) in all cases, except for nitrogen deposition in Bryce Canyon National Park, which exceeds the DAT.	Under Alternative C, impacts for sulfur and nitrogen deposition are below the DATs in all cases, except for nitrogen deposition in Bryce Canyon National Park, which exceeds the DAT.	Under Alternative K1, impacts would be equal to or less than those from the Proposed Action.
	<b>Air Resources: Greenhouse Gases</b>	Under the No Action Alternative, no impacts with respect to greenhouse gases (GHG) would occur as a function of mining. Existing and future emissions sources would continue to have impacts with respect to GHG.	Under the Proposed Action, annual GHG emissions (CO <sub>2</sub> ) would be approximately 0.014% of estimated 2010 global GHG emissions (this includes off-site end user combustion of the coal produced from the tract).	Under Alternative C, annual GHG emissions (CO <sub>2</sub> ) would be approximately 0.014% of estimated 2010 global GHG emissions (this includes off-site end user combustion of the coal produced from the tract).	Under Alternative K1, impacts would be equal to or less than those from the Proposed Action.
<b>4.4</b>	<b>Cultural Resources</b>	No impacts to cultural resources, beyond those that occur due to existing uses of the area, would occur under the No Action Alternative.  In addition, management of cultural resources on BLM-managed lands within the tract would continue at the discretion of the BLM under the KFO RMP (BLM 2008b).	Under the Proposed Action, 75 archaeological sites eligible for the NRHP would be completely or partially removed by pit disturbance. In addition, the following would occur under this alternative: <ul style="list-style-type: none"> <li>• Four NRHP-eligible archaeological sites would be completely or partially destroyed by construction of centralized facilities.</li> <li>• As many as two NRHP-eligible archaeological sites would be completely or partially destroyed by the relocation of KFO Route 116.</li> <li>• Approximately five NRHP-eligible archaeological sites would be completely or partially destroyed by the construction of dispersed facilities.</li> <li>• Underground mining could impact previously unidentified archaeological sites through subsidence.</li> <li>• An unknown number of previously unidentified archaeological sites could be impacted by pit disturbance, construction of centralized or dispersed facilities, or KFO Route 116 relocation.</li> <li>• Sites not directly impacted by surface mining or facilities construction would be subject to indirect effects from vandalism, looting, or unintentional destruction for the 25-year mine life.</li> <li>• Native American TCPs would be subject to adverse effects to their integrity of setting, feeling, and association due to visual, auditory, and other atmospheric impacts from mining activity for the 25-year mine life.</li> <li>• Panguitch Historic District and Utah Heritage Highway 89/Mormon Pioneer Heritage Area would be subject to adverse effects to their integrity of setting, feeling, and association due to an incremental increase in coal truck traffic for the 25-year mine life</li> </ul>	Under Alternative C, 69 NRHP-eligible archaeological sites would be completely or partially destroyed by pit disturbance. In addition, the following would occur under this alternative: <ul style="list-style-type: none"> <li>• Four NRHP-eligible archaeological sites would be completely or partially destroyed by construction of centralized facilities.</li> <li>• As many as two NRHP-eligible archaeological sites would be completely or partially destroyed by the relocation of KFO Route 116.</li> <li>• Approximately five NRHP-eligible archaeological sites would be completely or partially destroyed by the construction of dispersed facilities.</li> <li>• Underground mining could impact previously unidentified archaeological sites through subsidence.</li> <li>• An unknown number of previously unidentified archaeological sites could be impacted by pit disturbance, construction of centralized or dispersed facilities, or KFO Route 116 relocation.</li> <li>• Sites not directly impacted by surface mining or facilities construction would be subject to indirect effects from vandalism, looting, or unintentional destruction for the 21-year mine life.</li> <li>• Native American TCPs would be subject to adverse effects to their integrity of setting, feeling, and association due to visual, auditory, and other atmospheric impacts from mining activity for the 21-year mine life.</li> <li>• Panguitch Historic District and Utah Heritage Highway 89/Mormon Pioneer Heritage Area would be subject to adverse effects to their integrity of setting, feeling, and association due to an incremental increase in coal truck traffic for the 21-year mine life.</li> </ul>	Under Alternative K1, 29 NRHP-eligible sites would be completely or partially destroyed by pit disturbance. In addition, the following would occur under this alternative: <ul style="list-style-type: none"> <li>• Four NRHP-eligible archaeological sites would be completely or partially destroyed by construction of centralized facilities.</li> <li>• As many as two NRHP-eligible archaeological sites would be completely or partially destroyed by the relocation of KFO Route 116.</li> <li>• Approximately four NRHP-eligible archaeological sites would be completely or partially destroyed by the construction of dispersed facilities.</li> <li>• Underground mining could impact previously unidentified archaeological sites through subsidence.</li> <li>• An unknown number of previously unidentified archaeological sites could be impacted by pit disturbance, construction of centralized or dispersed facilities, or KFO Route 116 relocation.</li> <li>• Sites not directly impacted by surface mining or facilities construction would be subject to indirect effects from vandalism, looting, or unintentional destruction for the 16-year mine life.</li> <li>• Native American TCPs would be subject to adverse effects to their integrity of setting, feeling, and association due to visual, auditory, and other atmospheric impacts from mining activity for the 16-year mine life.</li> <li>• Panguitch Historic District and Utah Heritage Highway 89/Mormon Pioneer Heritage Area would be subject to adverse effects to their integrity of setting, feeling, and association due to an incremental increase in coal truck traffic for the 16-year mine life.</li> </ul>

**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
4.5	<b>Fire Management</b>	No impacts to fire management would occur under the No Action Alternative.	<p>Under the Proposed Action, approximately 1,975 acres of vegetation would be removed during mining and construction activities, which would result in the greatest risk of human-caused wildfires of all the alternatives. The revegetation of this entire acreage with suitable native and non-native species and the suppression of cheatgrass (<i>Bromus tectorum</i>) would lead to reduced fire regime conditions class ratings in these areas.</p> <p>6.5 miles of new roads would be constructed due to the relocation of KFO Route 116. This increase in new roads would result in an increased risk of human-caused wildfires from construction activities.</p> <p>The construction of centralized and dispersed facilities on 196 acres under the Proposed Action could lead to an increased risk of human-caused wildfires from construction activities in undisturbed vegetation.</p> <p>In addition, increased movement to and from the tract by construction equipment and coal haul trucks would increase the risk of fuel leakage and/or sparking that could lead to wildfires in the tract and adjacent transportation corridors. An estimated 153 coal haul vehicle round-trips per day are expected.</p>	<p>Impacts would be similar to those described under the Proposed Action, except that approximately 1,650 acres of vegetation would be removed during mining and construction activities and 4.6 miles of new roads would be constructed due to the relocation of KFO Route 116. This is more than the No Action but fewer than the Proposed Action. There would be an overall greater risk of human-caused wildfires compared to the No Action but a lesser risk compared to the Proposed Action due to fewer acres disturbed and a shorter time period when activities would take place (21 years instead of 25 years).</p> <p>The construction of centralized and dispersed facilities on 171 acres under Alternative C could lead to an increased risk of human-caused wildfires from construction activities in undisturbed vegetation.</p> <p>In addition, increased movement to and from the tract by construction equipment and coal haul trucks would increase the risk of fuel leakage and/or sparking that could lead to wildfires in the tract and adjacent transportation corridors. An estimated 153 coal haul vehicle round-trips per day are expected.</p>	<p>Impacts would be similar to those described under the Proposed Action, except that approximately 1,005 acres of vegetation would be removed during mining and construction activities and 2 miles of new roads would be constructed due to the relocation of KFO Route 116. This is more than the No Action but fewer than the Proposed Action and Alternative C. There would be an overall greater risk of human-caused wildfires compared to the No Action but a lesser risk compared to the Proposed Action and Alternative C due to fewer acres disturbed and a shorter time period when activities would take place (16 years instead of 25 or 21 years).</p> <p>The construction of centralized and dispersed facilities on 128 acres under Alternative K1 could lead to an increased risk of human-caused wildfires from construction activities in undisturbed vegetation.</p> <p>In addition, increased movement to and from the tract by construction equipment and coal haul trucks would increase the risk of fuel leakage and/or sparking that could lead to wildfires in the tract and adjacent transportation corridors. An estimated 153 coal haul vehicle round-trips per day are expected.</p>
4.6	<b>Geology and Minerals</b>	No impacts to geological or mineral resources would occur from surface mining under the No Action Alternative.	Under the Proposed Action, changes in topography, physiography, and stratigraphy would result from 1,750 acres of surface mining.	Under Alternative C, changes in topography, physiography, and stratigraphy would result from 1,454 acres of surface mining.	Under Alternative K1, changes in topography, physiography, and stratigraphy would result from 869 acres of surface mining.

**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
		No impacts to geological or mineral resources would occur from underground mining under the No Action Alternative.	Under the Proposed Action, subsidence and changes to stratigraphy would result from 613 acres of underground mining.	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
		No impacts to geological or mineral resources would occur from subsidence under the No Action Alternative.	Under the Proposed Action, subsidence would occur within 613 acres within the tract. Approximately 166 acres of subsidence would occur within the angle of influence outside the tract.	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
		No fault hazards from underground mining would occur under the No Action Alternative.	Slight fault hazard would occur from underground mining under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
		No impacts to geological or mineral resources would occur from landslides under the No Action Alternative.	A risk to structures would occur on or near landslide deposits under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
		No coal would be removed under the No Action Alternative.	Removal of 44.9 million tons of coal would occur under the Proposed Action.	Removal of 38.1 million tons of coal would occur under Alternative C.	Removal of 30 million tons of coal would occur under Alternative K1.
		Under the No Action Alternative, no impacts to geological or mineral resources would occur from fluid mineral removal due to high fluid mineral potential.	Decreased likelihood of fluid mineral removal due to mining activities would occur under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
		No impact to burnt shale would occur under the No Action Alternative.	Possible burial of burnt shale resources would occur under the Proposed Action.	Impacts would be the same in nature as those described under the Proposed Action, but would be smaller in magnitude because of the reduced acreage of mining.	Impacts would be the same in nature as those described under the Proposed Action, but would be smaller in magnitude than the Proposed Action and Alternative C because of the reduced acreage of mining.
		No impact to gravel would occur under the No Action Alternative.	Possible burial of gravel resources would occur under the Proposed Action.	Impacts would be the same in nature as those described under the Proposed Action, but would be smaller in magnitude because of the reduced acreage of mining.	Impacts would be the same in nature as those described under the Proposed Action, but would be smaller in magnitude than the Proposed Action and Alternative C because of the reduced acreage of mining.
		No impact to septarian nodules would occur under the No Action Alternative.	Possible damage or burial of septarian nodules would occur under the Proposed Action.	Impacts would be the same in nature as those described under the Proposed Action, but would be smaller in magnitude because of the reduced acreage of mining.	Impacts would be the same in nature as those described under the Proposed Action, but would be smaller in magnitude than the Proposed Action and Alternative C because of the reduced acreage of mining.
		Underground coal fires have the potential to occur through spontaneous combustion. Historical reviews and site visits have not shown any indication of past coal mine fires near the Alton Coal Tract.	Underground coal fires have the potential to occur through spontaneous combustion. Historical reviews and site visits have not shown any indication of past coal mine fires near the Alton Coal Tract. There is an increased risk of coal fires under the Proposed Action due to more coal being exposed to oxygen. Surface mining has occurred in the Alton Coal Tract in the past, and there is no evidence of fires during mining.	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
4.7	<b>Hazardous and Solid Waste</b>	No Impacts to hazardous and solid waste would occur under the No Action Alternative.	Under the Proposed Action, movement to and from the tract by service vehicles and coal haul trucks would have the potential to increase the risk of fuel leakage or solid waste spills in the tract and adjacent transportation corridors. Accidental or inadvertent leakages from storage tanks would also be possible. Spills would have adverse effects on soil, water, vegetation, and wildlife resources. Potential impacts would be mitigated through standard operating procedures and through the creation of other plans and policies that relate to hazardous materials disposal, transport, and emergency response.	Impacts would be the same as those described under the Proposed Action with the following exceptions. The acreage of dispersed facilities constructed would be fewer than under the Proposed Action (135 instead of 160), and therefore the associated risks, such as fuel leakage and storage tank leakage, would be smaller under this alternative. Mining activities under this alternative would take place over the course of 21 years, which is four years shorter than under the Proposed Action.	Impacts would be the same as those described under the Proposed Action with the following exceptions. The acreage of dispersed facilities constructed would be fewer than under the Proposed Action (92 instead of 160), and therefore the associated risks, such as fuel leakage and storage tank leakage, would be smaller under this alternative. Mining activities under this alternative would take place over the course of 16 years, which is nine years shorter than under the Proposed Action.
4.8	<b>Land Use and Access</b>	Land uses would continue in their current condition under the No Action Alternative.	Under the Proposed Action, 2,280 acres of federal land and 1,296 acres of private land would be unavailable for grazing and recreation access during mining activities (life of mine). Agriculture, tourism, and recreation activities would also be prohibited or restricted during the 25-year mine life.	Under Alternative C, 2,280 acres of federal land and 893 acres of private land would be unavailable for grazing and recreation access while mining activities were occurring. Impacts would be slightly fewer than the Proposed Action with 403 fewer acres available for mining. Agriculture, tourism, and recreation activities would also be prohibited or restricted during the 21-year mine life.	Under Alternative K1, 1,235 acres of federal land and 880 acres of private land would be unavailable for grazing and recreation access while mining activities were occurring. Impacts would be slightly fewer than the Proposed Action, with 1,462 fewer acres available for mining. Agriculture, tourism, and recreation activities would also be prohibited or restricted during the 16-year mine life.

**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
4.9	<b>Livestock Grazing</b>	No impacts would occur to grazing from the No Action Alternative. Grazing would continue in its current condition.	Impacts under the Proposed Action would consist of the temporary loss of forage as a result of restricted access, spread of noxious weeds, and/or decreased palatability from construction dust on 1,975 acres; the temporary loss of water sources and range improvements, such as fences and cattle guards; the loss of 3,220 animal unit month (AUMs) within seven allotments over the life of the mine and reclamation period; and livestock mortality from vehicle collisions.	Impacts under Alternative C would be the same as the Proposed Action, except that there would be restricted access for 31 years (due to the timeframe associated with reclamation), resulting in impacts to 1,650 acres of vegetation and 2,852 AUMs.	Impacts under Alternative K1 would be the same as the Proposed Action, except that there would be restricted access for 26 years (due to the timeframe associated with reclamation), resulting in impacts to 1,005 acres of vegetation and 2,392 AUMs.
4.10	<b>Paleontology</b>	No impacts to paleontological resources would occur under the No Action Alternative.	Impacts to paleontological resources under the Proposed Action could occur on approximately 1,750 acres of land that would be disturbed for pits, 196 acres of disturbance for centralized and dispersed facilities, and 17 acres of disturbance to relocate KFO Route 116. Impacts would include destruction/loss of paleontological resources in situ as well as educational opportunities arising from discovery.	Impacts to paleontological resources under Alternative C could occur on approximately 1,454 acres of land that would be disturbed for pits, 171 acres of disturbance for centralized and dispersed facilities, and 13 acres of disturbance to relocate KFO Route 116. Adverse impacts would include destruction/loss of paleontological resources in situ. Beneficial impacts would include educational opportunities arising from discovery.	Impacts to paleontological resources under Alternative K1 could occur on approximately 869 acres of land that would be disturbed for pits, 128 acres of disturbance for centralized and dispersed facilities, and 5.6 acres of disturbance to relocate KFO Route 116. Adverse impacts would include destruction/loss of paleontological resources in situ. Beneficial impacts would include educational opportunities arising from discovery.
4.11	<b>Recreation</b>	Recreation would not be impacted as a function of mining under the No Action Alternative. Presently occurring land uses would continue to interact with recreation trends in the analysis area under this alternative.	The Proposed Action would result in a loss of 3,576 acres of lands available for dispersed recreation from mining over the 25-year mine life. This represents 0.4% of all lands available for big game hunting in the PPMA. Approximately 13 miles of designated OHV routes would be temporarily removed over the life of the mine, representing a 0.7% decrease in OHV routes within the BLM-KFO.  In addition, displacement of recreational users onto 92,573 acres of adjacent public lands would affect recreational experiences of users on those lands. Approximately 3.9% of the recreation analysis area would be directly or indirectly affected by mine-related actions.	Alternative C would result in a loss of 3,173 acres of lands available for dispersed recreation from mining over the 21-year mine life. This represents 0.3% of all lands available for big game hunting in the PPMA. Impacts to OHV routes would be the same as the Proposed Action.  In addition, displacement of recreational users onto 92,573 acres of adjacent public lands would affect recreational experiences of users on those lands. Approximately 3.4% of the recreation analysis area would be directly or indirectly affected by mine-related actions.	Alternative K1 would result in a loss of 2,114 acres of lands available for dispersed recreation from mining over the 16-year mine life. This represents 0.2% of all lands available for big game hunting in the PPMA. Impacts to OHV routes would be the same as the Proposed Action.  In addition, displacement of recreational users onto 92,573 acres of adjacent public lands would affect recreational experiences of users on those lands. Approximately 2.3% of the recreation analysis area would be directly or indirectly affected by mine-related actions.
4.12	<b>Socioeconomics</b>	Socioeconomic conditions would be similar to current conditions under the No Action Alternative.	The Proposed Action would result in 160 direct jobs, 320 indirect jobs, \$6.5 million in annual wages, \$1.49 billion total recovery value, \$186.62 million total royalty revenue, and \$93.31 million royalty revenue disbursed to the State of Utah.  Additional taxes, fees, and payments would result, based on production amount.  The Proposed Action would result in adverse impacts to known recreation uses in the area (hunting and OHV use); current sense of community, social well-being, and tourism-related businesses; population, housing, and public health and safety.  Disproportionate environmental justice impacts would occur to the town of Alton related to noise and visual resources as a result of proposed mining activities.	Under Alternative C, socioeconomic impacts would be similar to the Proposed Action. Alternative C would result in \$1.25 billion total recovery value, \$156.66 million total royalty revenue, and \$78.33 million total revenue disbursed to the State of Utah.  Shortening the life of the mine by four years would result in an approximately 16% decrease in additional taxes, fees, and payments based on production amount.  Disproportionate environmental justice impacts would occur to the town of Alton related to air quality, noise, and visual resources as a result of proposed mining activities.	Under Alternative K1, socioeconomic impacts would be similar to the Proposed Action. Alternative K1 would result in \$95.04 million total recovery value, \$119.36 million total royalty revenue, and \$59.68 million total revenue disbursed to the State of Utah.  Shortening the life of the mine by nine years would result in an approximately 36% decrease in additional taxes, fees, and payments based on production amount.  Disproportionate environmental justice impacts would occur to the town of Alton related to noise and visual resources as a result of proposed mining activities.
4.13	<b>Soils</b>	No impacts to soils would occur under the No Action Alternative.	Under the Proposed Action, 1,993 acres of soils would be disturbed by surface mining and by the construction of related facilities and roads. Of this total, 1,750 acres of soil resources would be disturbed by surface mining, and 243 acres would be disturbed by related activities, including the construction of centralized and dispersed facilities, the relocation and construction of roads, and the grading of road ROWs. Impacts under the Proposed Action would be considerably greater than would occur under the No Action Alternative due to the large-scale removal and replacement of soils that would occur during proposed surface-mining operations (which would not occur under the No Action Alternative).  Surface-mining activities under the Proposed Action would drastically disturb soil resources through the large-scale removal, stockpiling, and replacement of soils during surface mining. A total of 1,750 acres of soils would be removed to its full depth where surface mining takes place, and topsoil and suitable subsoil would be stockpiled for reclamation. The disturbance (impact) caused by removing and replacing soils, as described above, would be long term. Most of the impacts (caused by facilities, some roads, etc.) would be long term, persisting for the life of the mine.	Under Alternative C, 1,662 acres of soils would be disturbed by surface mining and the construction of related facilities and roads. Of this total, 1,454 acres of soil resources would be disturbed by surface mining, and 208 acres would be disturbed by other related activities, including the construction of centralized and dispersed facilities, the relocation and construction of roads, and the grading of road ROWs. Impacts under Alternative C would be of the same nature as under Proposed Action, but to a lesser degree.	Under Alternative K1, 1,012 acres of soils would be disturbed by surface mining and the construction of related facilities and roads. Of this total, 869 acres of soil resources would be disturbed by surface mining, and 144 acres would be disturbed by other related activities, including the construction of centralized and dispersed facilities, the relocation and construction of roads, and the grading of road ROWs. Impacts under Alternative K1 would be of the same nature as under Proposed Action and Alternative C, but to a lesser degree.
4.14	<b>Transportation</b>	No impacts to transportation would occur under the No Action Alternative.	Under the Proposed Action, there would be a 2% increase in commuter traffic and coal truck traffic through Cedar City. Additional coal truck traffic would cause a 4% increase in traffic through Hatch and Panguitch.	Impacts under Alternative C would be the same as those described under the Proposed Action, except that the life of the mine would be 21 years instead of 25 years.	Impacts under Alternative K1 would be the same as those described under the Proposed Action, except that the life of the mine would be 16 years instead of 25 years.

**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
4.15	<b>Vegetation</b>	No impacts to vegetation would occur under the No Action Alternative.	Under the Proposed Action, 1,733 acres of vegetation would be removed by surface mining (of the 3,556 acres of vegetation in the tract). In addition, approximately 47 acres of vegetation would be removed for the relocation of KFO Route 116, approximately 36 acres of vegetation would be removed for centralized facilities, and approximately 160 acres of vegetation would be removed for dispersed facilities. Under the Proposed Action, the acres of land susceptible to weed invasion would be increased by approximately 2,266 acres, and all disturbed acres would be reclaimed and revegetated during the 25-year mine life and a 10-year restoration period.	Impacts under Alternative C would be the same as those described under the Proposed Action, but to a lesser degree. Under Alternative C, 1,454 acres of vegetation would be removed by surface mining (of the 3,162 acres of vegetation in the tract). In addition, approximately 36 acres of vegetation would be removed for the relocation of KFO Route 116, approximately 36 acres of vegetation would be removed for centralized facilities, and approximately 135 acres of vegetation would be removed for dispersed facilities. Under Alternative C, the acres of land susceptible to weed invasion would be increased by approximately 1,887, and all disturbed acres would be reclaimed and revegetated during the 21-year mine life and a 10-year restoration period.	Impacts under Alternative K1 would be the same as those described under the Proposed Action, but to a lesser degree. Under Alternative K1, 861 acres of vegetation would be removed by surface mining (of the 2,052 acres of vegetation in the tract). In addition, approximately 16 acres of vegetation would be removed for the relocation of KFO Route 116, approximately 36 acres of vegetation would be removed for centralized facilities, and approximately 92 acres of vegetation would be removed for dispersed facilities. Under Alternative K1, the acres of land susceptible to weed invasion would be increased by approximately 1,136 acres, and all disturbed acres would be reclaimed and revegetated during the 16-year mine life and a 10-year restoration period.
4.16	<b>Water Resources: Stream channel</b>	No stream relocation would occur under the No Action Alternative.	Under the Proposed Action, 0.49–0.81 mile of Robinson Creek would be relocated, potentially affecting stream function, associated riparian corridor, and water quality.	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
	<b>Water Resources: Surface water</b>	No change in surface water quality or quantity would occur under the No Action Alternative.	Under the Proposed Action, approximately 29 acre-feet of runoff water would be captured annually from pits and centralized facilities. In addition, small sediment loads to streams would occur from dispersed facilities and road ROW, and a loss of instream dilution could increase the concentration of total dissolved solids over the state water quality standard of 1,200 mg/L. Under the Proposed Action, reduced instream flows could result in less water available for irrigation downstream. In addition, a small risk of surface water contamination from accidental spills to 13.8 miles of stream that are within 100 feet of the reasonably foreseeable coal haul transportation route could occur, as well as a small increase in fine particles in streams associated with deposition of fugitive dust and coal dust.	Under Alternative C, approximately 24 acre-feet of runoff water would be captured annually from pits and centralized facilities. Sediment load, total dissolved solids, instream flow, and accidental spill-related impacts would be the same as those described under the Proposed Action, except for a shorter period of time.	Under Alternative K1, approximately 14 acre-feet of runoff water would be captured annually from pits and centralized facilities. Sediment load, total dissolved solids, instream flow, and accidental spill-related impacts would be the same as those described under the Proposed Action, except for a shorter period of time.
	<b>Water Resources: Groundwater</b>	No change in groundwater quality or quantity would occur under the No Action Alternative.	Under the Proposed Action, there would be a loss of 25 acre-feet of groundwater per year used for dust suppression for 25 years (625 acre-feet total), and a groundwater loss of 116 acre-feet per year due to evaporation in pits for 25 years (2,900 acre-feet). Groundwater losses would be up to approximately 6% of the total estimated groundwater available in the zone from which groundwater would be extracted for use in mining operations. Approximately 32.3 acre-feet of groundwater would be intercepted in mine pits annually. The potential for significant impacts to groundwater quality is also low because of the lack of groundwater resources in some mining blocks, the lack of groundwater resources in the coal zones of some mining blocks, and the already poor quality of groundwater resources in some mining blocks.	Under Alternative C, there would be a loss of 25 acre-feet of groundwater per year used for dust suppression for 21 years (525 acre-feet), and a groundwater loss of 233 acre-feet per year due to evaporation in pits for 21 years (4,893 acre-feet). Groundwater losses would be up to approximately 5% of the total estimated groundwater available in the zone from which groundwater would be extracted for use in mining operations. Approximately 32.3 acre-feet of groundwater would be intercepted in mine pits annually. The potential impacts to groundwater quality would be the same as those described under the Proposed Action.	Under Alternative K1, there would be a loss of 25 acre-feet of groundwater per year used for dust suppression for 16 years (400 acre-feet), and a groundwater loss of 116 acre-feet per year due to evaporation in pits for 16 years (1,856 acre-feet). Groundwater losses would be up to approximately 4% of the total estimated groundwater available in the zone from which groundwater would be extracted for use in mining operations. Approximately 32.3 acre-feet of groundwater would be intercepted in mine pits annually. The potential impacts to groundwater quality would be the same as those described under the Proposed Action.
	<b>Water Resources: Wetlands, riparian areas, floodplains, and AVFs</b>	No impacts to wetlands, riparian areas, floodplains, or AVFs would occur under the No Action Alternative.	Under the Proposed Action, approximately 32.5 acres of wetlands would be removed by surface-mining operations. Total disturbance to riparian areas would be 11.0 acres. Approximately 8.0 acres of AVFs would be disturbed due to construction of dispersed facilities. Impacts to these areas would include loss of habitat, destabilization of streambanks, floodplain storage and attenuation, water filtration, and groundwater recharge. Floodplains have the potential to be affected along approximately 60,565 linear feet of ephemeral and intermittent drainages within the surface mining areas of the coal zone associated with this alternative. Approximately 17,102 linear feet of perennial (including 96 linear feet of Kanab Creek), intermittent, and ephemeral drainages are within the underground mining area.	Under Alternative C, approximately 0.03 acre of wetlands would be removed by the relocation of KFO Route 116. Total disturbance to riparian areas would be 10.1 acres. Approximately 7.4 acres of AVFs would be disturbed due to construction of dispersed facilities. Impacts to these areas would include loss of habitat, destabilization of streambanks, floodplain storage and attenuation, water filtration, and groundwater recharge. Floodplains have the potential to be affected along approximately 52,660 linear feet of ephemeral and intermittent drainages within the surface mining areas of the coal zone associated with this alternative. Approximately 17,102 linear feet of intermittent and ephemeral drainages are within the underground mining area.	Under Alternative K1, approximately 0.03 acre of wetlands would be removed by the relocation of KFO Route 116. Total disturbance to riparian areas would be 11.4 acres. Approximately 9.0 acres of AVFs would be disturbed due to construction of dispersed facilities. Impacts to these areas would include loss of habitat, destabilization of streambanks, floodplain storage and attenuation, water filtration, and groundwater recharge. Floodplains have the potential to be affected along approximately 37,161 linear feet of ephemeral and intermittent drainages within the surface mining areas of the coal zone associated with this alternative. Approximately 17,102 linear feet of intermittent and ephemeral drainages are within the underground mining area.

**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
	<b>Water Resources: Subsidence</b>	No impacts to water resources would occur from subsidence under the No Action Alternative.	Under the Proposed Action, subsidence would occur on 613 acres within the tract. Approximately 166 acres of subsidence would occur within the angle of influence outside the tract. Potential subsidence-related water resources impacts include potential changes to surface drainage and deterioration of surface-water quality as well as changes to groundwater levels, flow, and quality	Impacts would be the same as those described under the Proposed Action.	Impacts would be the same as those described under the Proposed Action.
4.17	<b>Wildlife: General</b>	No Impacts to wildlife, as a function of mining the tract, would occur under the No Action Alternative.	<p>Direct and indirect impacts under the Proposed Action would occur to wildlife from habitat fragmentation, alteration, loss, and displacement due to surface disturbance, noise, ground vibration, night lighting, and increased risk of vehicle mortality associated with approximately 153 coal haul truck round-trips per day.</p> <p>In addition, surface mining, infrastructure, and road development would remove 1,975 acres (55%) of wildlife habitats within the 3,576-acre tract. Approximately 36 acres of habitats would be disturbed for the relocation of KFO Route 116.</p> <p>Approximately 29 acres of crucial summer habitat for mule deer would be disturbed under the Proposed Action. This represents 21% of this habitat in the tract and 0.03% of this habitat in the herd management unit (HMU). Approximately 1,803 acres of substantial value summer habitat for mule deer would be disturbed under the Proposed Action. This represents 52% of this habitat in the tract and 0.9% of this habitat in the HMU.</p> <p>Approximately 1,808 acres of substantial value summer habitat for Rocky Mountain elk would be disturbed under the Proposed Action. This represents 52% of this habitat in the tract and 2.2% of this habitat in the HMU.</p> <p>Approximately 25 acres of substantial value year-long habitat for Rocky Mountain elk would be disturbed under the Proposed Action. This represents 35% of this habitat in the tract and 0.01% of this habitat in the HMU.</p> <p>Surface water on the tract is limited, and flow rates in the larger streams on the tract (Kanab Creek and Lower Robinson Creek) are too minimal to support fish populations. Thus, impacts to fish species in the tract are unlikely to occur.</p> <p>Mining activities under the Proposed Action would occur 24 hours a day and six days a week over the 25-year mine life.</p> <p>All disturbed acres would be reclaimed and revegetated concurrently with mining and over the 10-year restoration period.</p> <p>Impacts on wildlife from coal truck traffic would include the potential for wildlife mortality along highways and would vary according to the individual's size, mobility, and movements. Large, nocturnal species and migratory species such as mule deer, elk, and pronghorn would be at the greatest risk. An increase in vehicle collision mortality of raptors and other bird species could also occur due to birds scavenging roadkill, and would be proportional to the volume of other animal mortalities.</p>	<p>The nature of impacts under Alternative C would be the same as under the Proposed Action but would differ in acreages and timing. Direct impacts under this alternative would occur from the removal of 1,650 acres (52%) of wildlife habitats within the 3,173-acre tract. Approximately 44 acres would be disturbed for the relocation of KFO Route 116.</p> <p>Approximately 1,526 acres of substantial value summer habitat for mule deer would be disturbed under Alternative C. This represents 50% of this habitat in the tract and 0.7% of this habitat in the HMU.</p> <p>Approximately 1,501 acres of substantial value summer habitat for Rocky Mountain elk would be disturbed under the Alternative C. This represents 48% of this habitat in the tract and 2% of this habitat in the HMU.</p> <p>Approximately 25 acres of substantial value year-long habitat for Rocky Mountain elk would be disturbed under Alternative C. This represents 35% of this habitat in the tract and 0.01% of this habitat in the HMU.</p> <p>Surface water on the tract is limited, and flow rates in the larger streams on the tract (Kanab Creek and Lower Robinson Creek) are too minimal to support fish populations. Thus, impacts to fish species in the tract are unlikely to occur.</p> <p>In addition, mining activities would occur 24 hours a day and six days a week over the 21-year mine life.</p> <p>All disturbed acres under this alternative would be reclaimed and revegetated concurrently with mining and over the 10-year restoration period.</p> <p>Potential impacts from coal truck traffic would be the same as those described under the Proposed Action, but would be shorter in duration because of the shorter mine life.</p>	<p>The nature of impacts under Alternative K1 would be the same as under the Proposed Action but would differ in acreages and timing. Direct impacts under this alternative would occur from the removal of 1,005 acres (48%) of wildlife habitats within the 2,114-acre tract. Approximately 16 acres would be disturbed for the relocation of KFO Route 116.</p> <p>Approximately 920 acres of substantial value summer habitat for mule deer would be disturbed under Alternative K1. This represents 46% of this habitat in the tract and 0.4% of this habitat in the HMU.</p> <p>Approximately 920 acres of substantial value summer habitat for Rocky Mountain elk would be disturbed under Alternative K1. This represents 44% of this habitat in the tract and 1% of this habitat in the HMU.</p> <p>Surface water on the tract is limited, and flow rates in the larger streams on the tract (Kanab Creek and Lower Robinson Creek) are too minimal to support large fish populations. Thus, impacts to fish species in the tract are unlikely to occur.</p> <p>In addition, mining activities would occur 24 hours a day and six days a week over the 16-year mine life.</p> <p>All disturbed acres under this alternative would be reclaimed and revegetated concurrently with mining and over the 10-year restoration period.</p> <p>Potential impacts from coal truck traffic would be the same as those described under the Proposed Action, but would be shorter in duration because of the shorter mine life.</p>

**Table 2.8.2.** Summary of Impacts

Section	Resource	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C (Reduced Tract Acreage and Seasonal Restrictions)	Alternative K1 (Reduced Tract Acreage)
4.18	<b>Wildlife: Special Status Species</b>	No Impacts to special status species as a function of mining the tract would occur under the No Action Alternative.	<p>Direct and indirect impacts under the Proposed Action would occur to special status species from habitat fragmentation, alteration, loss, and displacement due to surface disturbance, noise, ground vibration, night lighting, and increased risk of vehicle mortality associated with approximately 153 coal haul truck round-trips per day.</p> <p>In addition, surface mining, infrastructure, and road development would remove 1,975 acres (55%) of special status species habitats within the 3,576-acre tract. Approximately 36 acres of habitats would be disturbed for the relocation of KFO Route 116.</p> <p>Approximately 1,992 acres of Greater Sage-grouse occupied habitat would be disturbed under the Proposed Action. This represents 56% of this habitat in tract and 0.7% of this habitat in the SGMA.</p> <p>Approximately 914 acres of pygmy rabbit and kit fox habitat would be disturbed under the Proposed Action. This represents 57% of pygmy rabbit and kit fox habitat in the tract.</p> <p>Mining activities under the Proposed Action would occur 24 hours a day and six days a week over the 25-year mine life.</p> <p>All disturbed acres would be reclaimed and revegetated concurrently with mining and over the 10-year restoration period.</p> <p>Coal truck traffic impacts to special status species such as pygmy rabbit, Utah prairie-dog, and kit fox could include increased loss of individuals from vehicle collisions, increased predator abundance along roadways because of roadkills, and increased fragmentation in and among populations because of road barrier effects of increased traffic. Special status bat species could be displaced from habitat because of increased traffic noise and disruption of roosting or foraging habitat because of an increase in nighttime vehicle traffic. Special status raptor species could experience more vehicle strikes because increased roadkills would attract raptors to the coal haul route. Special status migratory bird and amphibian species could also experience an increase in vehicle strikes along the coal haul route. Coal truck traffic impacts to sage-grouse could include increased mortality from vehicle collisions, increased predator activity along the coal haul route because of increased roadkill, and disruption of courtship behavior or prevention of hens from locating lekking areas because of increased noise and vibration from coal truck traffic.</p>	<p>The nature of impacts under Alternative C would be the same as under the Proposed Action but would differ in acreages and timing. Direct impacts under this alternative would occur from the removal of 1,650 acres (52%) of special status species habitats within the 3,173-acre tract. Approximately 44 acres would be disturbed for the relocation of KFO Route 116.</p> <p>Approximately 1,661 acres of Greater Sage-grouse occupied habitat would be disturbed under Alternative C. This represents 53% of this habitat in tract and 0.6% of this habitat in the SGMA.</p> <p>Approximately 742 acres of pygmy rabbit and kit fox habitat would be disturbed under Alternative C. This represents 54% of pygmy rabbit and kit fox habitat in the tract.</p> <p>In addition, mining activities would occur 24 hours a day and six days a week over the 21-year mine life.</p> <p>All disturbed acres under this alternative would be reclaimed and revegetated concurrently with mining and over the 10-year restoration period.</p> <p>Coal truck traffic impacts would be the same as those described under the Proposed Action.</p>	<p>The nature of impacts under Alternative K1 would be the same as under the Proposed Action but would differ in acreages and timing. Direct impacts under this alternative would occur from the removal of 1,005 acres (48%) of special status species habitats within the 2,114-acre tract. Approximately 16 acres would be disturbed for the relocation of KFO Route 116.</p> <p>Approximately 1,012 acres of Greater Sage-grouse occupied habitat would be disturbed under Alternative K1. This represents 49% of this habitat in tract and 0.4% of this habitat in the SGMA.</p> <p>Approximately 327 acres of pygmy rabbit and kit fox habitat would be disturbed under Alternative K1. This represents 50% of pygmy rabbit and kit fox habitat in the tract.</p> <p>In addition, mining activities would occur 24 hours a day and six days a week over the 16-year mine life.</p> <p>All disturbed acres under this alternative would be reclaimed and revegetated concurrently with mining and over the 10-year restoration period.</p> <p>Coal truck traffic impacts would be the same as those described under the Proposed Action.</p>