



Summary: Final Uranium Leasing Program Programmatic Environmental Impact Statement

DOE/EIS-0472
March 2014



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

COVER SHEET

Lead Agency: U.S. Department of Energy (DOE)

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Title: Final Uranium Leasing Program Programmatic Environmental Impact Statement (DOE/EIS-0472)

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Abstract: The U.S. Department of Energy has prepared this *Final Uranium Leasing Program Programmatic Environmental Impact Statement* (ULP PEIS) pursuant to the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality's (CEQ's) NEPA regulations (40 CFR Parts 1500–1508), and DOE's NEPA implementing procedures (10 CFR Part 1021) to analyze the reasonably foreseeable environmental impacts, including the site-specific impacts, of the range of reasonable alternatives for the management of the ULP. DOE's ULP administers 31 tracts of land covering an aggregate of approximately 25,000 acres (10,000 ha) in Mesa, Montrose, and San Miguel Counties in western Colorado for exploration, mine development and operations, and reclamation of uranium mines. There are currently 29 existing leases; two of the lease tracts are not leased. Site-specific information available on the 31 lease tracts (including current lessee information and status, size of each lease tract, previous mining operations that occurred, location of existing permitted mines and associated structures, and other environmental information) has been utilized as the basis for the evaluation contained in this ULP PEIS.

DOE has evaluated five alternatives that address the range of reasonable alternatives for the management of the ULP. These alternatives are as follows:

- *Alternative 1:* DOE would terminate all leases, and all operations would be reclaimed by lessees. DOE would continue to manage the withdrawn lands, without leasing, in accordance with applicable requirements.

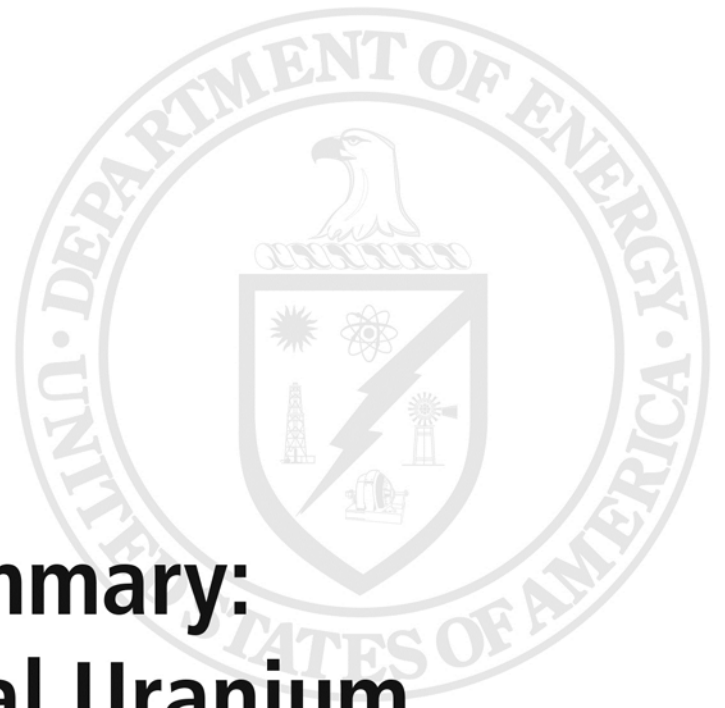
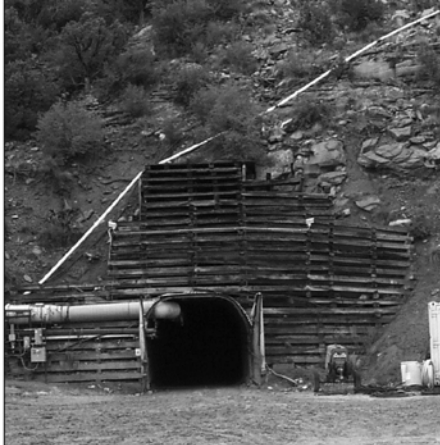
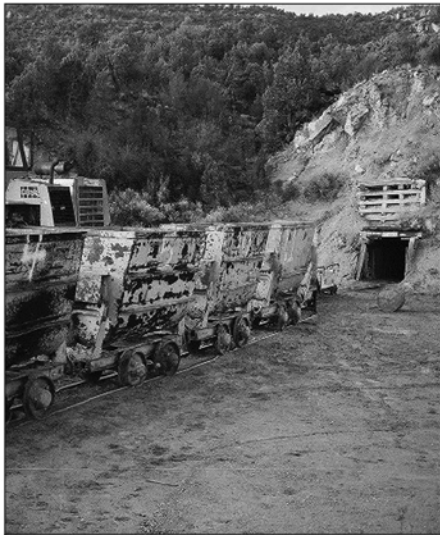
- 1 • *Alternative 2:* Same as Alternative 1, except once reclamation was completed
2 by lessees, DOE would relinquish the lands in accordance with
3 43 CFR Part 2370. If DOI/BLM determines, in accordance with that same Part
4 of the CFR, the lands were suitable to be managed as public domain lands,
5 they would be managed by BLM under its multiple use policies. DOE's
6 uranium leasing program would end.
7
- 8 • *Alternative 3:* DOE would continue the ULP as it existed before July 2007¹
9 with the 13 then-active leases, for the next 10-year period or for another
10 reasonable period, and DOE would terminate the remaining leases.
11
- 12 • *Alternative 4:* DOE would continue the ULP with the 31 lease tracts for the
13 next 10-year period or for another reasonable period.
14
- 15 • *Alternative 5:* This is the No Action Alternative, under which DOE would
16 continue the ULP with the 31 lease tracts for the remainder of the 10-year
17 period, as the leases were when they were issued in 2008.
18

19 ***Preferred Alternative:*** DOE's preferred alternative is Alternative 4.
20

21 ***Public Participation:*** DOE encourages public participation in the NEPA process. A Notice of
22 Availability (NOA) for the Draft ULP PEIS was published in the *Federal Register* on March 15,
23 2013 (78 FR 16483), and this began a 60-day public comment period that was to end on May 16,
24 2013. This comment period was later extended to May 31, 2013 (78 FR 23926), and it was
25 subsequently re-opened on June 3, 2013 (78 FR 33090), with a closing date of July 1, 2013.
26 Hearings were held on the Draft ULP PEIS in Grand Junction, Montrose, Telluride, and Naturita.
27 The public comment period, including the extension and the re-opening, lasted 109 days. All
28 comments received on the Draft ULP PEIS were considered in the preparation of the Final ULP
29 PEIS.
30

31 ***Changes from the Draft PEIS:*** In this Final PEIS, vertical lines in the margin indicate where the
32 Draft PEIS has been revised or supplemented. Deletions are not demarcated.
34
35

¹ In July 2007, DOE issued a programmatic environmental assessment and Finding of No Significant Impact for the ULP, which a U.S. District Court invalidated on October 18, 2011.



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1	NOA	Notice of Availability	
2	NOI	Notice of Intent	
3	NRC	U.S. Nuclear Regulatory Commission	
4			
5	PA	programmatic agreement	
6	PEA	programmatic environmental assessment	
7	PEIS	programmatic environmental impact statement	
8	PM	particulate matter	
9	PM _{2.5}	particulate matter with a mean diameter of 2.5 µm or less	
10	PM ₁₀	particulate matter with a mean diameter of 10 µm or less	
11			
12	RILOR	reclamation in lieu of royalties	
13	ROD	Record of Decision	
14	ROI	region of influence	
15	ROW	right-of-way	
16			
17	SHPO	State Historic Preservation Office	
18	SWMP	stormwater management plan	
19			
20	TC	Temporary Cessation	
21	TIS	traffic impact study	
22			
23	ULP	Uranium Leasing Program	
24	USC	<i>United States Code</i>	
25	USFWS	U.S. Fish and Wildlife Service	
26			
27	WL	working level	
28			
29			
30			

1 UNITS OF MEASURE

2				
3	ac-ft	acre-foot (feet)	lb	pound(s)
4				
5	cm	centimeter(s)	m	meter(s)
6			mi	mile(s)
7	dBa	a-weighted decibel(s)	mrem	millirem
8			mo	month
9	ft	foot (feet)		
10			ppm	part(s) per million
11	gal	gallon(s)		
12			rem	roentgen equivalent man
13	h	hour(s)		
14	ha	hectare(s)	s	second(s)
15				
16	in.	inch(es)	yr	year(s)
17				
18	kg	kilogram(s)	μm	micrometer(s)
19	km	kilometer(s)		
20				
21				

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CONVERSION TABLE
ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS

Multiply	By	To Obtain
<i>English/Metric Equivalentents</i>		
acres	0.004047	square kilometers (km ²)
acre-feet (ac-ft)	1,234	cubic meters (m ³)
cubic feet (ft ³)	0.02832	cubic meters (m ³)
cubic yards (yd ³)	0.7646	cubic meters (m ³)
degrees Fahrenheit (°F) -32	0.5555	degrees Celsius (°C)
feet (ft)	0.3048	meters (m)
gallons (gal)	3.785	liters (L)
gallons (gal)	0.003785	cubic meters (m ³)
inches (in.)	2.540	centimeters (cm)
miles (mi)	1.609	kilometers (km)
miles per hour (mph)	1.609	kilometers per hour (kph)
pounds (lb)	0.4536	kilograms (kg)
short tons (tons)	907.2	kilograms (kg)
short tons (tons)	0.9072	metric tons (t)
square feet (ft ²)	0.09290	square meters (m ²)
square yards (yd ²)	0.8361	square meters (m ²)
square miles (mi ²)	2.590	square kilometers (km ²)
yards (yd)	0.9144	meters (m)
<i>Metric/English Equivalentents</i>		
centimeters (cm)	0.3937	inches (in.)
cubic meters (m ³)	0.00081	acre-feet (ac-ft)
cubic meters (m ³)	35.31	cubic feet (ft ³)
cubic meters (m ³)	1.308	cubic yards (yd ³)
cubic meters (m ³)	264.2	gallons (gal)
degrees Celsius (°C) +17.78	1.8	degrees Fahrenheit (°F)
hectares (ha)	2.471	Acres
kilograms (kg)	2.205	pounds (lb)
kilograms (kg)	0.001102	short tons (tons)
kilometers (km)	0.6214	miles (mi)
kilometers per hour (kph)	0.6214	miles per hour (mph)
liters (L)	0.2642	gallons (gal)
meters (m)	3.281	feet (ft)
meters (m)	1.094	yards (yd)
metric tons (t)	1.102	short tons (tons)
square kilometers (km ²)	247.1	Acres
square kilometers (km ²)	0.3861	square miles (mi ²)
square meters (m ²)	10.76	square feet (ft ²)
square meters (m ²)	1.196	square yards (yd ²)

5

1 S.1 INTRODUCTION

2
3 The U.S. Department of Energy (DOE) has prepared the Uranium Leasing Program
4 (ULP) Programmatic Environmental Impact Statement (PEIS) pursuant to the National
5 Environmental Policy Act of 1969 (NEPA) (Title 42, Section 4321 and following sections of the
6 *United States Code* [42 USC 4321 *et seq.*]), the Council on Environmental Quality's (CEQ's)
7 NEPA regulations found in Title 40 of the *Code of Federal Regulations* (40 CFR Parts 1500–
8 1508), and DOE's NEPA implementing procedures (10 CFR Part 1021) in order to analyze the
9 reasonably foreseeable environmental impacts, including the site-specific impacts, of alternatives
10 for the management of the ULP. DOE's ULP administers tracts of land located in Mesa,
11 Montrose, and San Miguel Counties in western Colorado for the exploration, mine development
12 and operations, and extraction of uranium and vanadium ores.
13

14 S.1.1 Background

15
16 Congress authorized DOE's predecessor agency, the U.S. Atomic Energy Commission
17 (AEC), to develop a supply of domestic uranium. In 1948, the Bureau of Land Management
18 (BLM) issued Public Land Order 459, which stated, "Subject to valid existing rights and existing
19 withdrawals, the public lands and the minerals reserved to the United States in the patented lands
20 in the following areas in Colorado are hereby withdrawn from all forms of appropriation under
21 the public-land laws, including the mining laws but not the mineral-leasing laws, and reserved
22 for the use of the United States Atomic Energy Commission." Subsequently, other Public Land
23 Orders increased or decreased the total acreage of the withdrawn lands. In addition, the Federal
24 Government, through the Union Mines Development Corporation, acquired a substantial number
25 of patented and unpatented mining claims, mill² and tunnel³ site claims, and agricultural patents,
26 until the aggregated acreage managed by AEC totaled approximately 25,000 acres (10,000 ha).
27 The areas under consideration are located in western Colorado in Mesa, Montrose, and
28 San Miguel Counties.
29

30
31 Beginning in 1949, the AEC and its successor agencies, the U.S. Energy Research and
32 Development Administration and DOE, administered three separate and distinct leasing
33 programs during the ensuing 60 years, as summarized in Table S.1-1. To put the production
34 numbers in Table S.1-1 in perspective, domestic annual uranium production peaked in 1980 at
35 about 44 million lb (20 million kg), of which lease production that year represented about 2.5%
36 of the total. In addition, today's world market produces approximately 100 million lb
37 (45 million kg) of uranium annually and consumes twice that amount.
38

2 Mill sites are mining claims that may be located in connection with a specific placer or lode claim for mining and milling purposes or as an independent/custom mill site. Mill sites are located by metes and bounds or legal subdivision and are up to 5 acres (2 ha) in size.

3 A tunnel site is a mining claim that involves a tunnel to develop an underground vein or lode. It may also be used for the discovery of unknown veins or lodes. To stake a tunnel site, two stakes are placed up to 3,000 ft (900 m) apart on the line of the proposed tunnel. Recordation is the same as for a lode claim. A tunnel site can be regarded as more of a right of way than a mining claim.

1
2**TABLE S.1-1 Summary of Three Leasing Programs Administered between 1949 and 2008**

Years of Operation	No. of Leases	Lease Production (millions of lb) ^a		Royalties Generated (millions of \$)
		U ₃ O ₈	V ₂ O ₅	
1949–1962	48	1.2	6.8	5.9
1974–1994 ^b	43	6.5	33.0	53.0
1996–2008	15	0.3	1.4	4.0
Totals		8.0	41.2	62.9

^a Uranium ore is generated as uranium oxide (U₃O₈) and vanadium ore is generated as vanadium oxide (V₂O₅).

^b Mining operations peaked in 1980.

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In preparing for the 1974 leasing period, the AEC evaluated the potential environmental and economic impacts related to the leasing program. This evaluation was documented in *Environmental Statement, Leasing of AEC Controlled Uranium Bearing Lands* (AEC 1972). In 1995, DOE again evaluated the potential environmental and economic impacts related to the leasing program and documented its findings in the *Finding of No Significant Impact, Uranium Lease Management Program* (DOE 1995).

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15

When the first leasing program ended in 1962, the AEC directed the lessees to close the mines (to prohibit unauthorized entry), but little was done to reclaim the mine sites. These mine sites became DOE's "legacy mine sites," discussed later in this section.

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In 1974, the AEC initiated reclamation bonding requirements in its new lease agreements that ensured that all mine sites would be adequately reclaimed when lease operations ended. During this period, a new lessee could elect to incorporate an existing mine (from the previous leasing program) into its current operation. By so doing, the new lessee accepted the responsibility and liability associated with the ultimate reclamation of that mine site.

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In October 1994, DOE initiated a mine-site reconnaissance and reclamation project on the lease tracts. Each lease tract was thoroughly inspected to identify all the abandoned mine sites that resulted from pre-1974 leasing activities. After this identification process, all the mining-related features associated with each site were quantified and assessed for their historic importance. In 1995, in the absence of specific guidance pursuant to the reclamation of abandoned uranium mine sites, DOE initiated discussions with BLM officials that culminated in the establishment of a guidance document, *Uranium Closure/Reclamation Guidelines* (BLM 1995) for such sites. DOE's objective in establishing this guidance document was to assure that DOE's lease tracts were reclaimed in a manner that was acceptable to BLM so that the lands could be restored to the public domain and managed by BLM. Subsequently, DOE's "legacy" mine sites were prioritized and systematically reclaimed.

1 In July 2007, DOE issued a programmatic environmental assessment (PEA) for the ULP,
2 in which it examined three alternatives for the management of the ULP for the next 10 years
3 (DOE 2007). In that same month, DOE issued a Finding of No Significant Impact (FONSI), in
4 which DOE announced its decision to proceed with the Expanded Program Alternative, and also
5 determined that preparation of an environmental impact statement (EIS) was not required. Under
6 the Expanded Program Alternative, DOE would extend the 13 existing leases for a 10-year
7 period and would also expand the ULP to include the competitive offering of up to 25 additional
8 lease tracts to the domestic uranium industry.

9
10 In the fall of 2007, DOE, in preparation for the execution of new lease agreements for the
11 active lease tracts and the bid-solicitation process for the inactive lease tracts, reviewed the status
12 of its withdrawn lands to determine how to most efficiently and effectively manage those lands.
13 After an extensive review process, DOE decided to realign the existing lease tract boundaries to
14 incorporate those lands that recently reverted to the withdrawals. Concurrent with that action,
15 DOE also decided to systematically assess, and then reclaim, the abandoned uranium mine sites
16 and associated features located on those lands to mitigate the physical safety and environmental
17 hazards associated with the sites. In 2008, following the execution of the new lease agreements,
18 DOE, in accordance with Article XVI (Good Faith Negotiations), negotiated with its lessees to
19 reclaim the abandoned uranium mine sites and associated features on their respective lease tracts
20 in lieu of annual royalty payments due to the Government. These “reclamation in lieu of
21 royalties” (RILOR) negotiations, executed with up to five lessees in any one year, included
22 abandoned uranium mine sites and associated features on 19 lease tracts and took place over a
23 3-year period (2009–2011). Some features at some sites were left intact (barring imminent safety
24 hazards) because they were considered historically significant. At the culmination of these
25 activities, DOE determined that all legacy mine sites located on the lease tracts were completely
26 and successfully reclaimed.

27
28 In 2008, DOE implemented the Expanded Program Alternative and executed new lease
29 agreements with the existing lessees for their 13 respective lease tracts, effective April 30, 2008.
30 In addition, DOE offered the remaining, inactive lease tracts to industry for lease through a
31 competitive solicitation process. That process culminated in the execution of 18 new lease
32 agreements for the inactive lease tracts, effective June 27, 2008. Since that time, two lease tracts
33 were combined into one and another lease was relinquished back to DOE. Accordingly, there are
34 29 lease tracts that are actively held under lease and 2 lease tracts that are currently inactive.

35
36 Between 2009 and 2011, DOE approved seven exploration plans (one each for Lease
37 Tracts 13A, 15A, 17, 21, 24, 25, and 26). These exploration plans primarily involved the drilling
38 of at least one exploratory hole. To date, the approved exploration plans for Lease Tracts 15A
39 and 17 have not been implemented. Exploration activities typically resulted in surface
40 disturbance of less than 1 acre (0.4 ha). Disturbed lands were reclaimed by using polyurethane
41 foam to plug holes, and by using surface soils and established seed mixtures. There was also one
42 mine re-entry plan that was approved and implemented for Lease Tract 26. This plan included
43 mine re-entry activities whereby information was collected within an existing mine and the mine
44 was resecured. DOE also approved 20 reclamation plans to reclaim disturbed areas located on
45 Lease Tracts 5, 6, 7, 10, 11, 11A, 12, 13, 16, 16A, 17, 19, 19A, 20, 21, 22, 22A, 23, 26, and 27.
46 All approved reclamation plans have been implemented. Reclamation activities addressed open

1 drill holes and vents, land subsidences, and abandoned mine portals and adits. These exploration
2 and reclamation activities are further discussed and evaluated in the cumulative impacts section
3 (Section 4.7). In addition, for Lease Tract 13, a tamarisk removal activity was performed in lieu
4 of the payment of royalties by the lessee.

7 **S.1.2 Current Status of the ULP**

9 Colorado Environmental Coalition and three other plaintiffs filed a complaint against
10 DOE in the U.S. District Court for the District of Colorado on July 31, 2008, in which the
11 plaintiffs alleged, among other things, that DOE's July 2007 PEA and FONSI violated NEPA by
12 failing to consider adequately the environmental impacts of expansion of the ULP, and violated
13 the Endangered Species Act (ESA) by jeopardizing endangered species. On October 18, 2011,
14 the Court issued an Order in which it held, among other things, that DOE had violated NEPA by
15 issuing its July 2007 PEA and FONSI instead of preparing an EIS. In that Order, the Court
16 invalidated the July 2007 PEA and FONSI; stayed the 31 leases in existence under the ULP;
17 enjoined DOE from issuing any new leases on lands governed by the ULP; enjoined DOE from
18 approving any activities on lands governed by the ULP; and ordered that after DOE conducts an
19 environmental analysis that complies with NEPA, the ESA, all other governing statutes and
20 regulations, and the Court's Order, DOE could then move the Court to dissolve its injunction
21 (*Colorado Environmental Coalition v. DOE*, No. 08-cv-1624 [D. Colo. Oct. 18, 2011]).

23 The Court later granted in part DOE's motion for reconsideration of that Order and
24 amended its injunction to allow DOE, other Federal, state, or local governmental agencies,
25 and/or the ULP lessees to conduct only those activities on ULP lands that are absolutely
26 necessary: (1) to conduct DOE's environmental analysis regarding the ULP; (2) to comply with
27 orders from Federal, state, or local government regulatory agencies; (3) to remediate certain
28 dangers to public health, safety, and the environment on ULP lands; or (4) to conduct certain
29 activities to maintain the ULP lease tracts and their existing facilities (*Colorado Environmental*
30 *Coalition v. DOE*, No. 08-cv-1624 [D. Colo. Feb. 27, 2012]).

32 Currently, of the 31 ULP lease tracts, 29 have active leases and two do not; Lease
33 Tracts 8A and 14 (Parcels 14-1, 14-2, and 14-3) are currently not leased. Lease Tract 8A is a
34 small tract that is isolated and may be located entirely below (or outside) the uranium-bearing
35 formation, which could indicate a lack of ore. Lease Tract 14 comprises three parcels (14-1,
36 14-2, and 14-3). There was some interest in Parcels 14-1 and 14-2 by potential lessees in the
37 past; however, the third parcel (14-3, which lies east of 14-1) is located almost entirely within the
38 Dolores River corridor and was never leased. Section S.1.2.1 describes how DOE administers the
39 ULP; Section S.1.2.2 summarizes the requirements in the current leases; and Section S.1.3
40 presents site-specific information available on the 31 ULP lease tracts.

42 On June 21, 2011, DOE published the Notice of Intent (NOI) to prepare the ULP PEIS
43 (see Volume 76, page 36097 of the *Federal Register* [76 FR 36097]). In the NOI, DOE stated
44 that it had determined, in light of the site-specific information that DOE had gathered as a result
45 of the site-specific agency actions proposed and approved pursuant to the July 2007 PEA, that it
46 was appropriate for DOE to prepare a PEIS in order to analyze the reasonably foreseeable

1 environmental impacts, including potential site-specific impacts, of a range of alternatives for the
2 management of the ULP for the remainder of the 10-year period that was covered by the
3 July 2007 PEA. After DOE published the NOI, it notified the ULP lessees that until the PEIS
4 process was completed, DOE would not approve any new exploration and mining plans and
5 would not require any lessees to pay royalties.
6
7

8 **S.1.2.1 DOE ULP Administrative Process** 9

10 DOE's administration of the ULP includes the actions needed to manage the activities
11 conducted at the 31 lease tracts. Table S.1-2 lists the 31 lease tracts with applicable acreage,
12 current lessee, and the status of each. Figure S.1-1 shows the locations of the 31 ULP lease
13 tracts. These actions are undertaken to assure that the program's technical and administrative
14 objectives are accomplished. These actions include the following:
15

- 16 • Offer the lease tracts to the domestic uranium industry through a competitive
17 royalty-bid process that culminates in the award of each lease to the highest
18 qualified bidder.
19
- 20 • Inspect and maintain lease tract boundary markers and monuments on the
21 lease tracts. Establish and maintain records of survey control points for these
22 markers and monuments.
23
- 24 • Review lessees' exploration and mining plans, in coordination with BLM and
25 the Colorado Division of Reclamation, Mining, and Safety (CDRMS), to
26 ensure that they are consistent with Federal, state, and local rules and
27 regulations; existing environmental regulations; lease stipulations; and
28 standard industry practices. Approve or deny each plan as warranted.
29
- 30 • Coordinate with other Federal agencies (e.g., BLM, U.S. Fish and Wildlife
31 Service [USFWS], U.S. Environmental Protection Agency [EPA]), state
32 agencies (e.g., CDRMS, Colorado Division of Parks and Wildlife [CPW],
33 Colorado Department of Public Health and the Environment [CDPHE]), local
34 and tribal officials, and private entities as appropriate to address concerns that
35 they may have. Routinely review each Memorandum of Understanding
36 (MOU) established with BLM and CDRMS to ensure that the agreements
37 remain up to date and reflect actual work practices.
38
- 39 • Establish the amount of reclamation performance bonding appropriate for the
40 amount of environmental disturbance anticipated based on an evaluation of
41 the lessees' proposed activities, including site-specific access routes,
42 exploration drill-hole locations, mine-site support facility locations, and
43 proposed methods of reclamation.
44
45

1 **TABLE S.1-2 Summary of the 31 DOE ULP Lease Tracts in 2011**

	Lease Tract No.	Acreage	Current Lessee	County	Status ^a
	10	638	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
	11	1,303	Cotter Corporation	San Miguel	One new underground mine permitted and developed; reclamation of previously disturbed areas needed.
	11A	1,297	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
	12	641	Colorado Plateau Partners	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
	13	1,077	Gold Eagle Mining, Inc.	San Miguel	Three existing, permitted underground mines; reclamation of previously disturbed areas is needed.
	13A	420	Cotter Corporation	San Miguel	Exploration plan (one hole) approved; drilling and reclamation of the explored area are completed.
	14 (1, 2, 3)	971	Not applicable	San Miguel	Lease tract not currently leased.
	15	350	Gold Eagle Mining, Inc.	San Miguel	One existing underground mine; reclamation of previously disturbed areas is needed.
	15A	172	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
	16	1,790	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
	16A	585	Energy Fuels Resources Corp.	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
	5	151	Gold Eagle Mining, Inc.	Montrose	One existing, permitted underground mine; reclamation of previously disturbed areas is needed.

2

TABLE S.1-2 (Cont.)

	Lease Tract No.	Acreage	Current Lessee	County	Status ^a
13	5A (1, 2)	25	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
14	6	530	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
15	7 ^b	493	Cotter Corporation	Montrose	Two existing permitted mines—one underground mine and one large open-pit mine; reclamation of previously disturbed areas is needed.
16	8	955	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
17	8A	78	Not applicable	Montrose	Lease tract has not been leased.
18	9	1,037	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
19	17 (1, 2)	475	Golden Eagle Uranium, LLC	Montrose and San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
20	18	1,181	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
21	19	662	Energy Fuels Resources Corp.	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
22	19A	1,204	Energy Fuels Resources Corp.	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
23	20	627	Energy Fuels Resources Corp.	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
24	21	651	Cotter Corporation	Montrose	Exploration plan (two holes) approved; drilling and reclamation of the explored area are completed; no area needs to be reclaimed under current conditions.

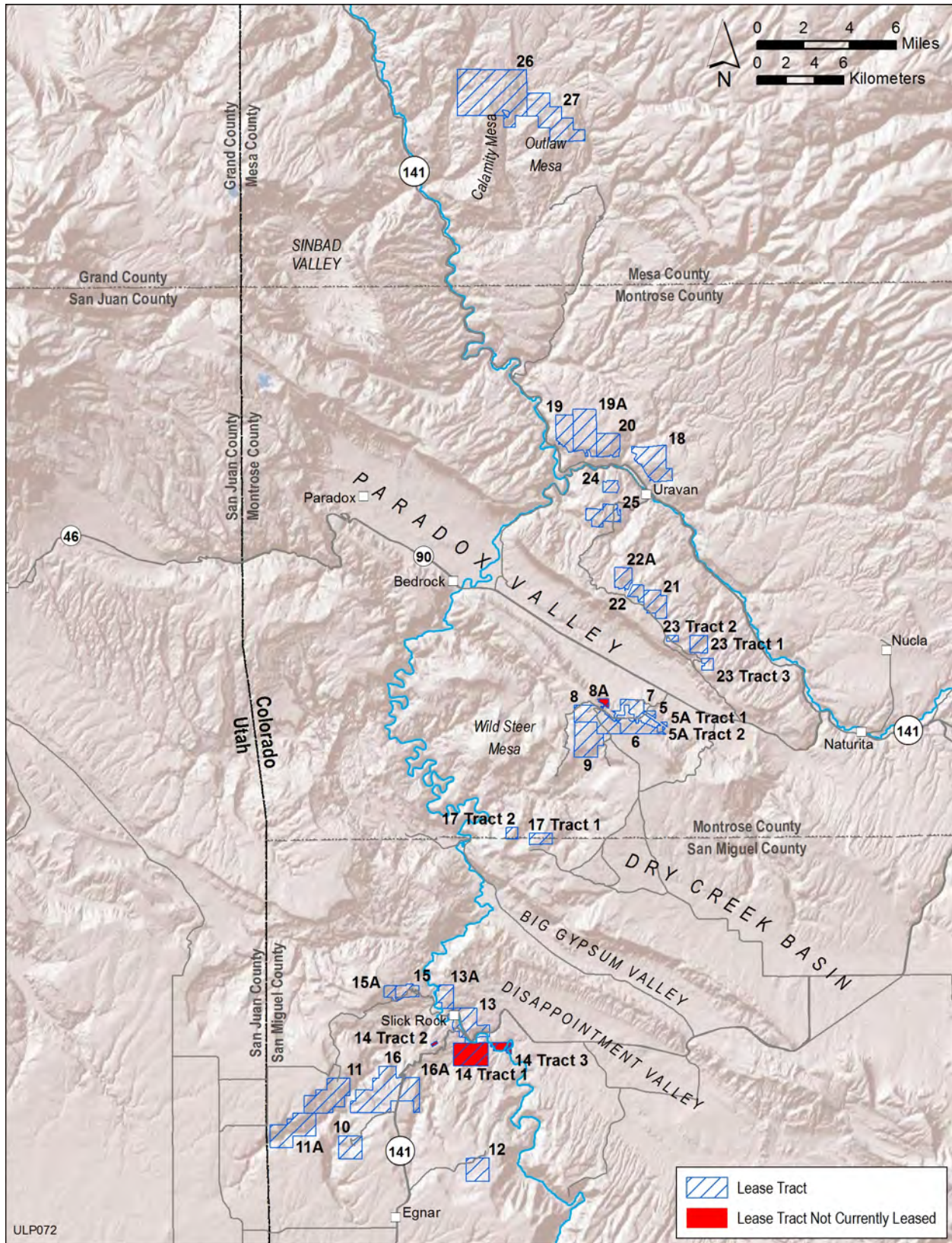
TABLE S.1-2 (Cont.)

	Lease Tract No.	Acreage	Current Lessee	County	Status ^a
25	22	224	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
26	22A	409	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
27	23 (1, 2, 3)	596	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
28	24	201	Energy Fuels Resources Corp.	Montrose	Exploration plan (eight holes) approved; drilling and reclamation of explored area are completed; no area needs to be reclaimed under current conditions.
29	25	639	Cotter Corporation	Montrose	Exploration plan (one hole) approved; drilling and reclamation of explored area are completed; no area needs to be reclaimed under current conditions.
30	26	3,989	Energy Fuels Resources Corp.	Mesa	Exploration plan (six holes) approved; drilling and reclamation of the explored area are completed; mine re-entry plan is approved, bulkhead partially removed, and assessment completed; portal is resecured; reclamation of previously disturbed areas is needed.
31	27	1,766	Energy Fuels Resources Corp.	Mesa	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
Total		25,137			

^a On October 18, 2011, a Federal district court stayed the 31 leases, and enjoined DOE from approving any activities on ULP lands. On February 27, 2012, the court amended its injunction to allow DOE, other Federal, state, or local governmental agencies, and the ULP lessees to conduct only those activities on ULP lands that are absolutely necessary, as described in the court's Order. See *Colorado Environmental Coalition v. Office of Legacy Management*, No. 08-cv-01624, 2012 U.S. DIST. LEXIS 24126 (D. Colo. Feb. 27, 2012).

^b Least Tracts 7 and 7A were combined (February 2011 time frame) into Lease Tract 7.

1
2
3



1

2 **FIGURE S.1-1 Locations of the 31 ULP Lease Tracts in Colorado**

- 1 • Monitor lessees' exploration, mine-development, and ore-production activities
2 to ensure compliance with Federal, state, and local environmental regulations
3 and lease stipulations. Identify adverse conditions that need to be addressed
4 and advise the lessees accordingly.
5
- 6 • Review exploration drill-hole logs, drill-hole maps, mine maps, and quarterly
7 reports submitted by the lessees to assess the lessees' progress and verify
8 conditions witnessed during field inspections.
9
- 10 • Review Federal and state mine safety inspection records and reports to
11 identify significant violations or adverse trends and determine whether actions
12 are warranted.
13
- 14 • Monitor and track market prices (spot and long term) for uranium oxide
15 (U_3O_8) and vanadium oxide (V_2O_5) (uranium ore is generated as uranium
16 oxide and vanadium ore is generated as vanadium oxide) and keep abreast of
17 activities occurring within the world uranium and vanadium industries.
18
- 19 • Develop and maintain procedures to process and maintain records of ores
20 produced from the DOE lease tracts and delivered to a mill or other receiving
21 station for processing. Calculate the resulting royalties due and payable to
22 DOE. Ensure that royalty payments are submitted in accordance with the lease
23 agreements. Maintain records associated with the number of miles traveled by
24 ore trucks on Federal, state, and county roadways. Ensure that lessees' pulp
25 ore samples are analyzed in accordance with lease agreement requirements.
26
- 27 • Maintain a record of and provide for the routine surveillance of concurrent
28 surface activities (e.g., activities associated with oil and gas leases and special
29 use permits) that are authorized by other agencies with surface-management
30 jurisdiction.
31
- 32 • Evaluate sample plants to verify that they or other facilities receiving lease
33 tract ores have adequate procedures for weighing, sampling, and assaying said
34 ores and for reporting the results to DOE.
35
- 36 • Monitor lessees' reclamation activities to ensure that they comply with
37 Federal, state, and local environmental regulations and lease stipulations.
38 Ensure that these activities are consistent with existing exploration and mining
39 plans and standard industry practices. Monitor post-reclamation sites for 3 to
40 5 years to assure that adequate vegetation is successfully re-established at the
41 site.
42
- 43 • Oversee the relinquishment of lease agreements when requested by a lessee or
44 the termination of lease agreements for cause when directed by DOE.
45

- 1 • Determine the eligibility of inactive, reclaimed lease tracts for restoration to
2 the public domain under BLM’s management. Prepare a Request to
3 Relinquish Lands and submit it to the BLM Colorado State Officer for
4 processing. Help BLM officials review the Request, and monitor its status
5 until the restoration process is complete.
6
7

8 **S.1.2.2 Lease Requirements** 9

10 Facsimiles of two generic leases currently utilized for the DOE ULP are shown in
11 Appendix A. (The leases could be modified in the future as a result of this ULP PEIS process.)
12 These two generic leases are the same except for how the royalty payment is determined. Before
13 conducting any exploratory or mining activity, the lessee is required to file a “Notice of Intent to
14 Conduct Prospecting Operations” or “Reclamation Permit Application” with the Colorado Mined
15 Land Reclamation Board for the review and approval of the CDRMS. The lessee is then required
16 to submit three copies of a detailed Exploration Plan or Mining Plan to DOE. This plan must
17 include a site-specific environmental analysis and a description of measures to be taken to assure
18 compliance with all Federal, state, and local laws (including all potential impacts that could
19 result in downstream or off-site environmental and/or resource degradation, and air quality or
20 health-related impacts). In addition, the lessee in coordination with DOE must consult with all
21 pertinent Federal, state, and local agencies—including, but not limited to, the BLM, USFWS,
22 U.S. Army Corps of Engineers (USACE), EPA, CPW, State Historic Preservation Office
23 (SHPO), and Indian tribal governments—to determine the presence and/or location of all
24 endangered, threatened, and sensitive plant and wildlife species; known cultural resources; and
25 floodplain and wetland areas. Plans are reviewed by DOE in coordination with BLM and
26 CDRMS, and upon DOE’s approval, the actions described in the plan can commence. DOE and
27 other appropriate agencies must be notified in writing if the lessee wishes to change part of the
28 plan, and no change can take place until approval is given. After the plan is approved, but before
29 any ground-disturbing activity can commence, the lessee must file a performance bond (the
30 amount is established by DOE) in coordination with CDRMS. This coordination is reflected in
31 the MOU between DOE and CDRMS (DOE and CDRMS 2012).
32

33 Upon termination of the lease, the lessee has 180 days to reclaim and return the land to
34 DOE, unless other arrangements have been agreed to in advance. The lessee is required to
35 remove all equipment, stockpiles, and evidence of mining, unless the improvement is a structural
36 support needed to maintain the mine.
37
38

39 **S.1.3 Site-Specific Information for the ULP Lease Tracts** 40

41 Information about the 31 lease tracts is presented in Table S.1-2 (and Figure S.1-1). Eight
42 of these lease tracts (5, 6, 7, 8, 9, 11, 13, and 18) contain one or more existing mines that
43 operated in the past under DOE’s approval and are currently permitted by CDRMS. Please note
44 that three additional lease tracts (13A, 21, and 25) have existing mine sites that have been fully
45 reclaimed in accordance with existing environmental regulations and DOE lease stipulations;
46 however, these mine sites currently remain permitted by CDRMS. Table S.1-3 lists the estimated
47 ore reserve that remains at each of the 31 lease tracts. Additional detailed site-specific

1
2**TABLE S.1-3 Estimated Remaining Ore Reserves at the ULP Lease Tracts**

ULP Lease Tract	Remaining Ore Reserves ^a (lb U ₃ O ₈)
5	230,000
5A	30,000
6	850,000
7	2,800,000
8	330,000
8A	30,000
9	630,000
10 ^b	0
11	740,000
11A	300,000
12	160,000
13	330,000
13A	220,000
14	85,000
15	84,000
15A	250,000
16	44,000
16A	18,000
17	75,000
18	1,200,000
19 ^b	0
19A	1,500,000
20	800,000
21	1,000,000
22	140,000
22A ^b	0
23	550,000
24	90,000
25	540,000
26	68,000
27	87,000
Total remaining ore reserves	13,000,000

^a Amount shown equals the lease “bid quantity” minus the total production to date. Values have been rounded to two significant figures.

^b The lease “bid quantity” has been produced from this tract; any additional reserves that may exist have not been quantified.

3
4

1 information concerning each of the ULP lease tracts is presented in Sections 1.3.1 through 1.3.31
2 of the ULP PEIS.

3
4 Site-specific information used as a basis for the ULP PEIS evaluation included mine
5 permit amendment applications for existing mines on Lease Tracts 6, 8, 9,11, 13A, 18, 21, and
6 25 (Cotter Corp. 2011, 2012a–g). These documents contain site-specific information on climate,
7 soils, and wildlife; wildlife mitigation measures; chemical evaluations; maps; monitoring data;
8 stormwater management plans; environmental protection plans (EPPs); reclamation plans;
9 emergency response plans; and geotechnical stability reports. CDRMS inspection reports were
10 also reviewed for the ULP PEIS evaluation. The inspection reports include information on the
11 conditions and characteristics of the mine sites. For example, inspection reports for several mines
12 located within Lease Tract 13 contain information on observations for contaminants and noxious
13 weeds, the presence and condition of mine facilities and stockpiles, and potential erosion and
14 stormwater runoff concerns (CDRMS 2012a–c).

15
16 Between 2009 and 2011, DOE approved the implementation of various exploration and
17 reclamation activities on several lease tracts. Exploration plans were approved for Lease
18 Tracts 13A, 15A, 17, 21, 24, 25, and 26 and were implemented for all these lease tracts except
19 for 15A and 17 (see Table 4.7-6). Various reclamation plans were submitted for disturbed areas
20 located on Lease Tracts 5, 6, 7, 10, 11, 11A, 12, 13, 16, 16A, 17, 19, 19A, 20, 21, 22, 22A, 23,
21 26, and 27 (see Table 4.7-7). These plans described reclamation work conducted in lieu of
22 payment of royalties (or RILORs) and included work on mining-related features, such as open
23 drill holes and vents, land subsidence features, and abandoned mine portals and adits.

24 25 26 **S.1.4 Purpose and Need for Agency Action**

27
28 The underlying purpose and need for agency action is to support the implementation of
29 the Atomic Energy Act (AEA), which authorized and directed DOE, among other things, to
30 develop a supply of domestic uranium (42 U.S.C. § 2096), and “to issue leases or permits for
31 prospecting for, exploration for, mining of, or removal of deposits of source material in lands
32 belonging to the United States” to the extent that DOE deems it necessary to effectuate the
33 provisions of the AEA (42 U.S.C. § 2097). Congress further recognized the importance of
34 developing a supply of domestic uranium and other source material when it stated in the AEA, in
35 its Congressional findings, that the processing of source material must be regulated “in order to
36 provide for the common defense and security” (42 U.S.C. § 2012(d)). In addition, the Energy
37 Policy Act of 2005 (Public Law 109-58) (EPAct) expressed a continued commitment to
38 “decreasing the dependence of the United States on foreign energy supplies”
39 (42 U.S.C. 16181(a)(3)); and to “[e]nhancing nuclear power’s viability as part of the
40 United States energy portfolio” (42 U.S.C. § 16271(a)(1)). The ULP contributes to the
41 development of a supply of domestic uranium consistent with the provisions of the AEA and
42 EPAct. In support of these statutes, DOE needs to determine the future course of the ULP,
43 including whether to continue leasing some or all of the withdrawn lands and other claims
44 (referred to as “DOE-managed lands”) for the exploration and production of uranium and
45 vanadium ores.

46

1 **S.1.5 Proposed Action**

2
3 DOE's proposed action is to decide whether to continue the ULP and, if it decides to
4 continue the ULP, to determine which alternative to adopt in order to manage the ULP. DOE
5 developed the range of alternatives by carefully considering DOE's underlying need for action
6 and comments received during the public scoping period for the ULP PEIS.
7

8 **S.1.6 Cooperating and Commenting Agencies**

9
10
11 DOE invited various Federal, state, and county agencies and tribal nations to participate
12 either as a cooperating agency or commenting agency in the preparation of the ULP PEIS. Since
13 January 2012, monthly, as appropriate, telephone conferences have been held between DOE and
14 the cooperating agencies to develop the ULP PEIS. The following government agencies and
15 tribal groups are participating as cooperating agencies by providing their expertise and
16 knowledge:
17

- 18 1. *BLM*: Jurisdictional responsibilities in land use planning, designations, or
19 restrictions on and surrounding DOE-withdrawn lands; and an understanding
20 of the potential impacts from increased mining and oil and gas exploration and
21 development. An MOU between the BLM and DOE (BLM and DOE 2010) is
22 currently in place that identifies the individual and shared roles and
23 responsibilities of DOE and the BLM with respect to the DOE ULP
24 (see Section 5.4 for a summary of this MOU).
25
- 26 2. *EPA*: Expertise in addressing the protection of human health and the environment
27 (e.g., water quality, air quality, and radiation protection).
28
- 29 3. *Colorado Department of Transportation (CDOT)*: Knowledge of local and
30 regional transportation systems including primary and secondary highways.
31
- 32 4. *CDRMS*: Expertise in mining and reclamation and the safety requirements
33 attendant to these activities. An MOU between DOE and CDRMS (DOE and
34 CDRMS 2012) is currently in place for the purpose of promoting coordination
35 between DOE and CDRMS to result in efficient and effective oversight of
36 uranium and vanadium mining on the DOE ULP lease tracts (see Section 5.4
37 for a summary of this MOU).
38
- 39 5. *CPW*: Expertise in addressing the protection of wildlife.
40
- 41 6. *Mesa County Commission*: Expertise in identifying limits to mitigate potential
42 impacts that energy development activities, such as uranium mining, would
43 have on the county's economy, residents, and the environment, including its
44 primary and secondary roadways.
45

- 1 7. *Montrose County Commissioners*: Expertise in socioeconomic, transportation,
2 and water quality issues related to the county.
3
- 4 8. *San Juan County Commission*: Expertise in identifying limits to mitigate
5 potential impacts that energy development activities, such as uranium mining,
6 would have on the county's economy, residents, and the environment,
7 including its primary and secondary roadways.
8
- 9 9. *San Miguel County Board of Commissioners*: Expertise in identifying limits to
10 mitigate potential impacts that energy development activities, such as uranium
11 mining, would have on the county's economy, residents, and the environment,
12 including its primary and secondary roadways and land use and planning.
13
- 14 10. *Navajo Nation*: Knowledge of cultural resources in the area.
15
- 16 11. *Pueblo of Acoma*: Knowledge of cultural resources in the area. |
17
- 18 12. *Pueblo de Cochiti*: Knowledge of cultural resources in the area. |
19
- 20 13. *Pueblo de Isleta*: Knowledge of cultural resources in the area. |
21
- 22 14. *Southern Ute Indian Tribe*: Knowledge of cultural resources in the area.
23

24 The following agencies and tribal groups chose to participate as commenting agencies,
25 and they were included in the project distribution list and received the Draft ULP PEIS for
26 review and comment: |

- 27
- 28 1. USFWS,
29
- 30 2. U.S. Nuclear Regulatory Commission (NRC),
31
- 32 3. CDPHE,
33
- 34 4. Utah Department of Transportation (UDOT),
35
- 36 5. Hopi Nation,
37
- 38 6. Ute Indian Tribe,
39
- 40 7. Ute Mountain Ute Tribe, and
41
- 42 8. White Mesa Ute Community. |
43
44

1 **S.1.7 Consultation**

2
3 DOE is complying with Executive Order (E.O.) 13175, Section 7 of the ESA, and
4 Section 106 of the National Historic Preservation Act (NHPA) by engaging in consultations with
5 respective tribes, government agencies, and local historical groups. Sections 6.1, 6.2, and 6.3
6 describe the consultation efforts undertaken to date.

7
8 The government-to-government relationship with Indian tribes was formally recognized
9 by the Federal Government with E.O. 13175 on November 6, 2000, and DOE is coordinating and
10 consulting with Indian tribal governments, Indian tribal communities, and tribal individuals
11 whose interests might be directly and substantially affected by activities on the ULP lands. As
12 part of this consultation, DOE has contacted 25 Indian tribal governments to communicate the
13 opportunities for government-to-government consultations by participating in the planning and
14 resource management decision-making throughout the ULP PEIS process. Five are participating
15 as cooperating agencies, and four are participating as commenting agencies (see Section S.1.6).
16

17 In the NOI (76 FR 36097) to prepare the ULP PEIS, DOE stated that it is preparing to
18 enter into consultation with the USFWS, in compliance with Section 7 of the Endangered
19 Species Act, concerning DOE's management of the ULP. Section 7 requires Federal agencies to
20 consider the effect of their undertakings on species listed under the Act and to consult with the
21 USFWS to ensure that the action or actions that they fund, authorize, or permit are not likely to
22 jeopardize the continued existence of any listed species or result in the destruction or adverse
23 modification of the critical habitat of such species. DOE and the USFWS initiated the informal
24 consultation, and DOE submitted a final biological assessment (BA) to the USFWS on May 14,
25 2013. The USFWS issued a biological opinion (BO) on August 19, 2013. Details are discussed in
26 Section 6.2 of the ULP PEIS.

27
28 DOE has initiated programmatic consultation, in compliance with Section 106 of the
29 NHPA, concerning DOE's management of the ULP. For the ULP, per the procedure that has
30 historically been and is currently still being carried out, DOE has addressed consultation through
31 the BLM and the lessees on specific undertakings when ULP activities/plans have been
32 proposed. However, since the NHPA allows for the utilization of a programmatic agreement
33 (PA) to govern large or complex projects, and since PAs can be used when effects on historic
34 properties are expected to be similar and repetitive or regional in scope or when these effects
35 cannot be fully determined prior to approval of an undertaking, DOE has initiated the
36 development of a PA for the ULP.
37
38
39

1 S.2 NEPA PROCESS FOR THE ULP PEIS

2
3 During the preparation of the ULP PEIS, opportunities
4 for public participation have been and are being provided
5 (see Figure S.2-1). After the ULP PEIS is completed and at
6 least 30 days after the EPA issues a notice of availability of
7 the Final ULP PEIS, DOE may issue a Record of Decision
8 (ROD) announcing DOE's selection of an alternative for the
9 continued management of the ULP. Section 2.6 of the ULP
10 PEIS identifies DOE's preferred alternative (Alternative 4, to
11 continue with exploration, mine development and operations,
12 or reclamation on the 31 DOE ULP lease tracts for 10 years or
13 another reasonable time period). After the ROD is issued, as
14 plans (for exploration, mine development and operation, or
15 reclamation) are submitted by the lessees to DOE for
16 approval, further NEPA review for a given action would be
17 conducted. The level of follow-on NEPA review to be done
18 (e.g., categorical exclusion determination, environmental
19 assessment, or environmental impact statement) would depend
20 on the action being proposed by the lessees, as indicated in the
21 plans submitted. For mining plans to be submitted for
22 approval, DOE will require, at a minimum, an environmental
23 assessment (EA) with appropriate public involvement to be
24 prepared to further evaluate potential site impacts. This NEPA
25 review would be conducted to inform DOE's decision on
26 approval of the plans, including the conditions DOE would
27 require to mitigate potential impacts. As discussed in
28 Section 1.2.1 (where requirements of current leases are summarized), no activity can be
29 undertaken by the lessees until DOE has approved the plans or otherwise acted on the plans.
30 DOE's review would be conducted in consultation with Federal, state, local agencies, and tribal
31 entities for site-specific actions, as appropriate. Public participation on the follow-on NEPA
32 review would occur in a manner consistent with the level of review conducted and with DOE and
33 CEQ regulations. Section S.2.1 discusses the public scoping process for the ULP PEIS.
34 Section S.2.2 discusses the public comment process for the ULP PEIS.



FIGURE S.2-1 NEPA Process for the ULP PEIS

37 S.2.1 Public Scoping Process

38
39 Consistent with CEQ requirements (40 CFR 1501.7) and DOE NEPA implementation
40 procedures (10 CFR 1021.311), an early and open scoping process was carried out to determine
41 the scope of the PEIS and identify significant issues related to the proposed action.
42
43

1 The NOI (76 FR 36097) to prepare the ULP PEIS was issued on June 21, 2011, and a
2 supplemental notice (76 FR 43678) was issued on July 21, 2011, to announce the four public
3 scoping meetings and their locations and to announce the extension of the public scoping period
4 to September 9, 2011. Public scoping meetings were held in Montrose, Telluride, and Naturita in
5 Colorado and in Monticello, Utah.
6

7 In addition to presenting comments at the scoping meetings, stakeholders were also able
8 to mail comments directly to DOE or submit comments through the project web site
9 (<http://ulpeis.anl.gov/>). A total of 287 unique “comment documents” were submitted by
10 individuals, organizations, and government agencies to provide comments on the scope of the
11 PEIS. A comment document is a written document, an e-mail submission, or an oral presentation
12 given during a scoping meeting that provides comments on the scope of a PEIS. A single
13 comment document may contain multiple comments on one or more issues. There were
14 61 comment documents provided at the scoping meetings; 164 were mailed to DOE (counting
15 both e-mails and regular mail), and 62 were submitted electronically through the project web
16 site. Of these comment documents, 8 were received from Federal, state, or local government
17 agencies, with the remainder being from individuals or other organizations. Comment documents
18 were received from 13 states; of the 262 comments for which a state of origin was identified,
19 approximately 88% were from Colorado within the potentially affected areas.
20

21 Comments received during the public scoping period focused on whether or not the ULP
22 or uranium mining at the lease tracts should be continued. Representative comments and DOE
23 responses are provided as follows. The first set of comments (Section S.2.1.1) consists of those
24 comments determined to be within the PEIS scope, and the second set (Section S.2.1.2) consists
25 of those determined to be outside the scope of the ULP PEIS.
26

27 28 **S.2.1.1 Comments Considered Within the ULP PEIS Scope** 29

- 30 • *The current leases should be terminated and reclamation conducted, after*
31 *which uranium mining should not be conducted on the lands. The lands could*
32 *be restored to the public domain under BLM oversight and the DOE ULP*
33 *terminated.*
34

35 Alternatives 1 and 2 evaluated in the ULP PEIS address this comment. Under
36 Alternative 1, all leases on the 31 lease tracts would be terminated, and
37 reclamation would be conducted where needed. The lands would then be
38 maintained per DOE oversight without leasing for uranium mining.

39 Alternative 2 evaluated in the ULP PEIS is similar to Alternative 1, except
40 once reclamation was completed by lessees, DOE’s jurisdiction would return
41 to BLM, if approved by the U.S. Department of the Interior (DOI)/BLM (in
42 accordance with 43 CFR § 2372.3). If approved, the land would be managed
43 by BLM. DOE’s uranium leasing program would end.
44

- 1 • *DOE should continue with the ULP and continue to make the 31 lease tracts*
2 *available for exploration, mine development and operations, and reclamation,*
3 *as was the case before the preparation of the PEIS was initiated.*
4

5 Alternatives 4 and 5 evaluated in the ULP PEIS address this comment. Under
6 Alternative 4, DOE would continue the ULP with the 31 lease tracts for the
7 next 10-year period or for another reasonable period. Alternative 5 is similar
8 to Alternative 4 except that the lease period is limited to the remainder of the
9 current 10-year lease period, and the leases would continue exactly as they
10 were issued in 2008.

- 11
12 • *DOE should prohibit any further mining or exploration until reclamation has*
13 *been completed on existing or old leases.*
14

15 As mentioned above, reclamation would be conducted where needed as part of
16 the alternatives evaluated in the ULP PEIS. In addition, all legacy mine sites
17 located on the DOE lease tracts have already been reclaimed.
18

- 19 • *DOE should stipulate protection of the Dolores and San Miguel River*
20 *watersheds.*
21

22 The preferred alternative includes a requirement for future mines to be at least
23 0.25 mi (0.40 km) from the Dolores River. The San Miguel River is about
24 0.3 mi (0.54 km) from the closest lease tracts. The evaluation for water quality
25 discussed in the ULP PEIS (as summarized in Section S.4) considers both the
26 Dolores and San Miguel Rivers.
27

- 28 • *Potential impacts from uranium mining at the DOE ULP lease tracts on air*
29 *quality, water quality, human health, socioeconomics, transportation, views*
30 *from sensitive areas, and cultural resources should be evaluated.*
31

32 Chapter 4 of the ULP PEIS analyzes the potential impacts associated with
33 human health and environmental resource areas listed. Potential impacts on
34 noise, soil resources, land use, ecology, environmental justice, and waste
35 management are also analyzed.
36

- 37 • *DOE should undertake its duties under Section 7 of the ESA.*
38

39 DOE engaged in consultation with the USFWS pursuant to Section 7 of the
40 ESA. Both a BA and a BO have been completed and are presented in
41 Appendix E. Chapter 6 of the ULP PEIS presents a summary of this
42 consultation.
43

- 1 • *DOE should collaborate with other agencies, including the CDRMS, BLM,*
2 *and EPA.*

3
4 DOE is collaborating with various agencies, including CDRMS, BLM, and
5 EPA, on this PEIS process. Section S.1-6 presents a list of the cooperating
6 agencies and the commenting agencies.

- 7
8 • *The review and approval process must include a site-specific NEPA review*
9 *for each proposed mining operation.*

10
11 The ULP PEIS utilizes site-specific data that are available and contains in
12 Section S.2 a discussion of the NEPA process that would be conducted once
13 site-specific and project-specific mine plans were submitted by the lessees to
14 DOE for review and approval.

- 15
16 • *Include impacts from the release of radioactive and other toxic materials into*
17 *the atmosphere from mining and milling operations.*

18
19 Chapter 4 of the ULP PEIS addresses the potential impacts from the release of
20 material associated with the ore production. Although potential impacts of
21 milling operations are outside the scope of the proposed action, the
22 transportation of ore generated from the ULP lease tracts to the mills and the
23 cumulative impacts from the mills are evaluated in Chapter 4.

- 24
25 • *Address the long-term impacts on human health, livestock, and wildlife,*
26 *including food sources, both locally and regionally, due to mining and milling*
27 *activities. The PEIS must consider health effects of mining and milling,*
28 *including cancer incidence, on the human population in towns neighboring*
29 *the mining operation, workers, and local residents.*

30
31 The analyses of impacts on human health and ecological resources (on
32 livestock and wildlife) address the concern about potential impacts from
33 mining operations. The analysis of human health impacts in Chapter 4
34 considers the population within a 50-mi (80-km) radius of the lease tract. This
35 region of influence (ROI) was selected to assess the potential impact on the
36 population as a whole (i.e., for collective dose evaluation). At this distance,
37 the individual doses would have dropped to negligible levels (<0.1–0.2
38 mrem/yr), which supports that the selection of 50 mi (80 km) as the ROI is
39 conservative. The analysis for potential impacts on ecological resources
40 addresses resources in the three counties that encompass the 31 lease tracts.
41 The cumulative impacts evaluated in the ULP PEIS (see Section 4.7) address
42 a 50-mi (80-km) radius of the lease tracts and include the White Mesa and
43 Piñon Ridge Mills.

44
45

S.2.1.2 Comments Considered Outside the ULP PEIS Scope

- *Because of unstable uranium markets and the uncertainty of future commercial development of nuclear power facilities, uranium should be preserved for the future use by the American people until it becomes critical for national strategic energy purposes.*

Analyses of future uranium markets, and the future commercial development of nuclear power facilities, are not within the scope of the purpose and need for DOE's action (described in Section S.1.4 of this Summary). See also Section S.2.2.1.

- *Analyze a No Action Alternative that would allow the leases to lapse with no reclamation conducted.*

The option of not performing reclamation when leases lapse or are terminated is not consistent with the requirements of the leases, the ULP, and applicable laws and is therefore not considered a reasonable alternative to evaluate in the ULP PEIS.

- *Analyze the economic benefits of fully reclaiming and rehabilitating all Federal and state lands in the Uranium Mineral Belt and compare that to the economic benefit of maintaining the existing uranium leases over the next 5 years.*

The economic study suggested is not relevant and is considered outside the scope of the ULP PEIS. It does not meet the purpose and need for DOE's action (described in Section S.1.4 of this Summary).

- *Include an alternative that requires old, inactive, and/or abandoned mines to be reclaimed before new leases are granted or any new mines are established.*

DOE has reclaimed all abandoned mines within its purview. The 29 leases that currently exist have been in place since 2008, and all mining activities are currently on hold until the completion of this PEIS process.

S.2.2 Public Comment Process

A Notice of Availability (NOA) for the Draft ULP PEIS was published in the *Federal Register* on March 15, 2013 (78 FR 16483), and this began a 60-day public comment period that was to end on May 16, 2013. This comment period was later extended to May 31, 2013 (78 FR 23926), and it was subsequently re-opened on June 3, 2013 (78 FR 33090), with a closing date of July 1, 2013. The public comment period, including the extension and the re-opening, lasted 109 days. All comments received on the Draft ULP PEIS were considered in the preparation of the ULP PEIS and are presented in Section I.4 of Appendix I of the ULP PEIS.

1 An important part of the NEPA process involves giving the public the opportunity to
 2 provide input and comments on a Draft PEIS for consideration in the preparation of a Final
 3 PEIS. DOE issued the Draft ULP PEIS for review and comment by other Federal agencies,
 4 states, American Indian tribal governments, local governments, and the public. DOE distributed
 5 copies to those organizations and government officials known to have an interest in the PEIS and
 6 to those organizations and individuals who requested a copy. Copies were also made available on
 7 the project web site (<http://www.ulpeis.anl.gov/>), the DOE NEPA web site
 8 (<http://energy.gov/nepa/>), and in regional DOE public document reading rooms and public
 9 libraries. Announcements indicating the availability of the Draft ULP PEIS and the dates and
 10 times of the public hearings were published in local newspapers (see Table S.2-1).

11
 12 Each of the public hearings started with an open house that lasted about half an hour,
 13 with posters that explained the NEPA process and the alternatives and evaluations presented in
 14 the ULP PEIS. Copies of the Summary document and presentation were also made available to
 15 the public. Subject matter experts were on hand to answer questions the public may have had as
 16 they viewed the poster display.

17
 18 After the open house, DOE gave an overview of the Draft ULP PEIS, and attendees were
 19 given an opportunity to provide oral and written comments. Each oral comment presentation,
 20 recorded by a court reporter as part of the hearing transcript, was considered as a comment
 21 document. Written comments submitted by individuals during the hearings were likewise
 22 considered to be comment documents. The transcripts for the four hearings are posted on the
 23 project web site.

24
 25 DOE received a total of 258 comment documents, which accounted for approximately
 26 1,200 individual comments. Of the 258 comment documents received, 18 were from
 27 organizations or Federal or state agencies and 240 were from private citizens. Written comments
 28 were received via letter, email, or through submission of a comment form provided at the public
 29 hearings or on the project web site. Oral comments are included in transcripts documenting each
 30 of the public hearings held on the Draft ULP PEIS. See Appendix I for the complete comment
 31 response document.

32
 33
 34 **TABLE S.2-1 Draft ULP PEIS Public**
 35 **Hearing Locations in Colorado, Dates, and**
 36 **Attendance**

Location	Date	Attendance
Grand Junction	April 22, 2013	52
Montrose	April 23, 2013	40
Telluride	April 24, 2013	54
Naturita	April 25, 2013	22

37
 38

1 DOE has identified nine topics of interest based on the comments that were most
2 frequently received and/or the comments that indicated a broad public concern. These topics are
3 summarized in Section S.2.2.1 below. The order in which the topics are presented and discussed
4 here does not indicate the importance of one topic over another.
5
6

7 **S.2.2.1 Nine Topics of Interest Based on Public Comments Received**

8

- 9 • *PEIS analyses need to be more site-specific and more robust in scope.*
10 *Assumptions used need to be supported with citations — Commenters said*
11 *that the analyses performed in the PEIS to estimate the impacts of the*
12 *program were inadequate. Many commenters asserted that the assumptions*
13 *made to support the analysis are arbitrary and not supported by citations.*
14 *Commenters requested that more site-specific data be included and evaluated*
15 *so that conclusions presented can better support site-specific decisions.*
16

17 The evaluations conducted for the PEIS were based on site-specific information (see
18 Section S.1.3 for a summary of this information). The information is adequate to support the
19 environmental analysis of the alternatives evaluated and for making fully informed decisions
20 relative to any of the alternatives. Although site-specific information for future mines is not
21 available until the lessees submit specific mine plans, information is available from past mining
22 activities (e.g., cultural resources, threatened and endangered species, waste-rock and ore
23 characteristics, and transportation practices and routes) and is sufficient for supporting the
24 analyses of potential impacts from future mining activities for the five alternatives, including a
25 thorough cumulative effects analysis.
26

27 The evaluation of potential transportation impacts presented in this PEIS was done in
28 consultation with the Colorado Department of Transportation as reflected in Section S.4 (and
29 also in Section 4.3.10 and Table 4.6-1).
30

31 The potential impacts on water depletion in the Upper Colorado watershed are evaluated
32 in the PEIS, and DOE has consulted with the USFWS with regard to how this water depletion
33 would potentially impact the Colorado four endangered fish species. PEIS text has been revised
34 to be consistent with the BA and BO as reflected in Section S.4.
35

36 DOE has initiated programmatic consultation, in compliance with Section 106 of the
37 NHPA, concerning DOE's management of the ULP. Section 106 of the NHPA requires Federal
38 agencies to consider the effect of their undertakings on historic properties and to consult with the
39 appropriate SHPO, American Council on Historic Preservation, and other parties that have an
40 interest in the effects of the undertaking on historic properties. For the ULP, per the procedure
41 that has historically been and is currently still being carried out, DOE has addressed consultation
42 through the BLM and the lessees on specific undertakings when ULP activities/plans have been
43 proposed. However, since the NHPA allows for the utilization of a programmatic agreement
44 (PA) to govern large or complex projects, and since PAs can be used when effects on historic
45 properties are expected to be similar and repetitive or regional in scope or when these effects
46 cannot be fully determined prior to approval of an undertaking, DOE has initiated the

1 development of a PA for the ULP. DOE initiated discussion with the BLM and the Colorado
2 SHPO on May 30, 2013. The PA will be revised to address input and review from the consulting
3 parties, and then routed to the responsive parties for concurrence. The DOE Office of Legacy
4 Management plans to have the PA in place before issuance of the ULP PEIS ROD.

- 5
- 6 • *Support Alternative 1, which states that DOE would terminate all leases, and*
7 *all operations would be reclaimed by lessees. DOE would continue to manage*
8 *the withdrawn lands, without uranium leasing, in accordance with applicable*
9 *requirements — Commenters requested that the ULP be terminated and that*
10 *lessees be required to reclaim their operations on their respective lease tracts.*
11 *Commenters cited concerns over natural resources, cultural resources, human*
12 *health, socioeconomic impacts, transportation, and visual impacts of uranium*
13 *mining in Colorado for Alternatives 3, 4, and 5.*
- 14

15 DOE has evaluated the range of reasonable alternatives to meet the purpose and need
16 discussed in Section S.1.4. After carefully considering all public comments and the results of the
17 PEIS evaluation, DOE has retained Alternative 4 as the preferred alternative in this PEIS. The
18 PEIS evaluation for potential impacts from the five alternatives is summarized in Section S.4.
19 The potential impacts on the resource areas evaluated for the five alternatives generally would be
20 negligible to moderate and could be further minimized by implementing the compliance and
21 mitigation measures and/or best management practices (BMPs) described in Section S.5 and
22 Table S.5-1. All three phases of mining (exploration, mine development and operations, and
23 reclamation) were evaluated for Alternatives 3, 4, and 5, while only reclamation was evaluated
24 for Alternatives 1 and 2, since these two alternatives do not include continued future uranium
25 mining. See also the discussion in the first bullet of this section.

26

- 27 • *Support Alternative 4, which is DOE's preferred alternative identified in the*
28 *ULP PEIS. Under Alternative 4, DOE would continue the ULP with the*
29 *31 lease tracts for the next 10-year period or for another reasonable*
30 *period — Many commenters voiced support for Alternative 4, under which*
31 *DOE would continue the ULP with the 31 lease tracts for the next 10-year*
32 *period or for another reasonable period. DOE identified Alternative 4 as its*
33 *preferred alternative. Commenters cited their support of uranium mining and*
34 *the need to secure uranium resources. They also said that the jobs created by*
35 *the mining industry were beneficial to the region and its inhabitants. They*
36 *noted their support for the PEIS procedures and noted that the environmental*
37 *impact analysis was robust. These commenters said that the uranium mining*
38 *was safe and had a low environmental impact and that the lessees were good*
39 *stewards of the environment. They mentioned that it would be preferable to*
40 *mine uranium in the United States, where environmental regulations are*
41 *stringent and enforced. Finally, they noted that nuclear energy is an*
42 *important source of domestic energy production.*
- 43

44 DOE has carefully considered all public comments and the results of the ULP PEIS
45 evaluation and has identified Alternative 4 as its preferred alternative in this ULP PEIS. The
46 potential impacts are summarized in Section S.4. DOE believes that uranium mining activities at

1 the ULP lease tracts can continue to be conducted in a manner protective of the environment and
2 public health, as supported by the ULP PEIS analyses and results obtained. For Alternative 4,
3 mine development and operations could create about 229 direct jobs and 152 indirect jobs,
4 generating about \$14.8 million in income. Average unemployment for Mesa, Montrose, and
5 San Miguel Counties for 2011 was reported to be about 10.3%, 11%, and 7.6%, respectively.
6

- 7 • *Concern for NEPA-related issues, such as the appropriateness and adequacy*
8 *of the purpose and need described in the ULP PEIS; the adequacy of the*
9 *range of alternatives presented and evaluated; and the need for more specific*
10 *information to assure that appropriate follow-on NEPA reviews will be*
11 *conducted as specific mine plans are submitted for DOE approval — Many*
12 *commenters said that the purpose and need as identified in the PEIS was*
13 *inadequate. For example, some commenters requested that a reclamation*
14 *alternative, in which the ULP is terminated and all disturbed areas are*
15 *reclaimed, be added to the ULP PEIS. Other commenters requested that an*
16 *alternative that would keep the uranium ore in place until demand is evident*
17 *be included in the ULP PEIS.*

18
19 *Some commenters stated that the purpose and need requires an expansion of*
20 *the scope of the PEIS. Other commenters noted that the alternatives identified*
21 *in the PEIS did not support the Purpose and Need Statement or that the*
22 *Purpose and Need Statement was inappropriate. Some commenters said that*
23 *the ULP PEIS fails to satisfy NEPA because additional follow-on NEPA*
24 *review will not be required for future actions on the ULP lease tracts due to*
25 *the categorical exclusions provided under the program. To protect Federal*
26 *lands, these commenters requested that further NEPA reviews, or, at a*
27 *minimum, an environmental assessment (EA), be performed for future action*
28 *on the lease tracts. Some commenters said that the public was not given*
29 *sufficient time to comment on the PEIS documents. Many commenters*
30 *requested that the PEIS be re-done and re-released with these issues*
31 *addressed.*
32

33 DOE does not agree with the comments alleging that the purpose and need for the
34 proposed action requires expansion of the scope of the PEIS. As explained in PEIS Section 1.4,
35 “Purpose and Need for Agency Action,” the underlying purpose and need for agency action was
36 established by the U.S. Congress in two provisions of the AEA: 42 U.S.C. § 2096, which
37 authorized and directed DOE, among other things, to develop a supply of domestic uranium; and
38 42 U.S.C. § 2097, which authorized DOE “to issue leases or permits for prospecting for,
39 exploration for, mining of, or removal of deposits of source material [including uranium ore] in
40 lands belonging to the United States” to the extent DOE deems necessary to effectuate the
41 provisions of the AEA.
42

43 The Purpose and Need for agency action, as described in the ULP PEIS Section 1.4, is to
44 support the implementation of those two AEA provisions. Section 1.4 recognizes that in order to
45 support these provisions, “DOE needs to determine the future course of the ULP, including
46 whether to continue leasing some or all of DOE’s withdrawn lands and other claims . . . for the

1 exploration and production of uranium and vanadium ores.” PEIS Section 1.6, “Scope of the
2 ULP PEIS,” therefore describes the scope of its analysis as the evaluation of the five alternatives
3 for managing the ULP, and the evaluation of “the three mining phases associated with the
4 underground and surface open-pit mining methods,” which “are the exploration phase, mine
5 development and operations phase, and reclamation phase.” Therefore, the AEA provisions are
6 consistent with the present scope of the ULP PEIS, and do not require that the scope be expanded
7 beyond the ULP to analyze the entire nuclear fuel cycle. Further, no DOE decision to be based
8 on this PEIS would change the nation’s use of nuclear fuels, including use of nuclear power
9 reactors and management of associated radioactive materials. These and other aspects of the back
10 end of the nuclear fuel cycle are the subject of numerous other NEPA reviews, including many
11 EISs prepared by the Nuclear Regulatory Commission.

12
13 The DPEIS’s Purpose and Need section, in addition to citing the AEA, also cited the
14 Energy Policy Act of 2005, Public Law 109-58 (EPACT), and stated that EPACT “emphasized
15 the reestablishment of nuclear power (Sections 601 through 657).” Comments alleged that the
16 DPEIS thereby expanded the purpose of the proposed action “through a suggestion that the 2005
17 Energy Policy Act calls for more nuclear energy,” and that the scope should be expanded to
18 include the nuclear fuel cycle for that reason. It was not DOE’s intent to make that suggestion in
19 the DPEIS. The cited EPACT sections 601 through 657 constitute EPACT’s Title VI, entitled
20 “Nuclear Matters,” which addressed various nuclear matters and amended several sections of the
21 AEA. However, EPACT’s Title VI did not “call for more nuclear energy,” or amend the two
22 provisions of the AEA that the DPEIS cited in the beginning of its Purpose and Need Section:
23 42 U.S.C. §§ 2096-2097. In order to avoid any confusion regarding the interpretation of the
24 DPEIS’s references to EPAct, DOE has amended the Purpose and Need section of this PEIS, in
25 Section 1.4, to explain that Congress expressed, in EPAct, a continued commitment to
26 “decreasing the dependence of the United States on foreign energy supplies”
27 (42 U.S.C. 16181(a)(3)); and to “[e]nhancing nuclear power’s viability as part of the
28 United States energy portfolio” (42 U.S.C. §16271 (a)(1). The development of a supply of
29 domestic uranium supports the provisions of the AEA and the EPAct. However, the development
30 of a supply of domestic uranium is separate and distinct from the future utilization of nuclear
31 energy during the entire nuclear fuel cycle. The ULP is related to uranium supply, rather than to
32 future use, which is dependent upon the exact level of future demand for nuclear energy and is
33 therefore uncertain and speculative. The development of a domestic uranium supply, as
34 authorized and directed by Congress in the AEA, enables DOE to support future demand that is
35 uncertain at the present time, whatever its exact level may turn out to be in the future.

36
37 Alternative 1 evaluated in the Draft PEIS does provide a localized, in depth analysis—
38 this alternative involves the termination of the leases with reclamation as required. DOE’s land
39 withdrawal relates to the extraction of uranium and vanadium resources from the ULP lease
40 tracts. As such, developing alternative energy is outside the scope of the ULP.

41
42 DOE does not agree with comments that the Purpose and Need Statement must specify
43 the lessees mitigation requirements; however, the PEIS does contain a robust discussion of
44 mitigation requirements (see Section S.5).

45

1 Regarding comments about follow-on NEPA reviews, the Draft PEIS stated (see
2 Section S.2) that “After the ROD [Record of Decision] is issued, as plans (for exploration, mine
3 development and operation, and reclamation) are submitted by the lessees to DOE for approval,
4 further NEPA review for a given action would be conducted. The level of follow-on NEPA
5 review to be done (e.g., categorical exclusion determination, environmental assessment, or
6 environmental impact statement) would depend on the action being proposed by the lessees, as
7 indicated in the plans submitted. This NEPA review would be conducted to inform DOE’s
8 decision on approval of the specific plans, including the conditions DOE would require to
9 mitigate potential impacts.” Based on the comments received, Section S.2 has been revised to
10 state that for all future mining plans submitted for approval, DOE will require, at a minimum, an
11 EA with appropriate public involvement to be prepared to further evaluate potential site-specific
12 impacts. DOE will issue categorical exclusion determinations for classes of actions such as
13 routine maintenance activities that DOE has determined by regulation do not have the potential
14 to result in significant environmental impacts. DOE makes its categorical exclusion
15 determinations publicly available on the internet.
16

17 Although some commenters said the public was not given sufficient time to comment on
18 the Draft PEIS, DOE provided over twice the mandatory duration. The 60-day comment period
19 initially provided exceeded the required 45-day comment period. The comment period was
20 extended twice, so that the final comment period lasted for 109 days.
21

22 After deliberation, DOE considers that re-issuing of the ULP PEIS is not necessary. DOE
23 has adequately evaluated the range of reasonable alternatives. The information and analysis in
24 the PEIS are adequate to support the environmental analysis of any of the alternatives
25 (see discussion in S.4 for a summary of potential impacts discussed in the PEIS). DOE has
26 reviewed the public comments and, while DOE has made revisions to the document in response
27 to comments, DOE has not made substantial changes to the proposed action and no significant
28 new information has been discovered so as to warrant issuing a revised Draft ULP PEIS.
29

- 30 • *Reclaim and clean up previously mined sites; conduct reclamation of mined*
31 *locations during long periods of inactivity — Many commenters said that*
32 *previously disturbed mining sites should be reclaimed before any new mining*
33 *moves forward. Commenters said that cleanup would provide the region with*
34 *many more jobs and lead to higher economic growth than that realized from*
35 *uranium mining. Some commenters voiced a preference for these types of jobs*
36 *over jobs from the mining industry.*
37

38 Reclamation of all legacy mines under DOE’s oversight within the ULP has been
39 completed. There are currently 12 existing mines on eight lease tracts that will ultimately be
40 reclaimed under the ULP. Other mines in the region are not under the ULP and not under DOE’s
41 oversight or authority to reclaim. With regard to the number of jobs that could be generated from
42 the reclamation of the 12 existing mines on the ULP lease tracts, the estimates provided in
43 Alternative 1 (which evaluates reclamation of these 12 existing mines) indicate that up to
44 29 direct jobs and 16 indirect jobs could be generated.
45

1 Reclamation is required by Federal and state law and by provisions of the lease.
2 Consistent with state requirements, one lease holder has filed EPPs, and another lease holder has
3 submitted reclamation plans. State law requires lease holders to enter Temporary Cessation (TC)
4 if inactive for more than 180 days for an initial period of 5 years. A second 5-year TC may be
5 granted by the state. However, under no circumstances shall the TC period be longer than
6 10 consecutive years. If TC reaches the 10-year maximum, or a second 5-year period is not
7 granted, an operator is required to either reactivate for a year or fully comply with reclamation
8 and EPP requirements.

- 9
- 10 • *Maintain mined uranium ore from the ULP lease tracts as a domestic*
11 *supply — Many commenters noted in their submissions that they would*
12 *prefer that uranium mined in the United States not be exported to foreign*
13 *governments. Some commenters voiced concerns over national security*
14 *interests, saying that uranium should not be sold to foreign governments to*
15 *prevent them from engaging in uranium enrichment activities as part of a*
16 *program to develop nuclear weapons. Other commenters voiced concerns*
17 *over energy policy interests, saying that uranium should not be exported to*
18 *foreign governments because domestic nuclear energy needs take precedence.*
19 *Commenters explained that there is no need to generate additional uranium*
20 *supply because there are already sufficient supplies of uranium stockpiled for*
21 *domestic use. Uranium ores should be kept in the ground until the time comes*
22 *when the stockpiled domestic supply needs to be augmented.*
- 23

24 DOE's proposed action in the PEIS does not address uranium ore exports, over which the
25 NRC, not DOE, has authority; and the scope of analysis in the PEIS does not analyze the
26 possibility that uranium ore from the ULP may be subject to export. The possibility that uranium
27 or uranium ore from the ULP may be subject to being exported does not undermine the PEIS's
28 stated purpose and need, and does not require that the PEIS's scope be expanded to analyze the
29 export of uranium or uranium ore. Any export of domestic uranium or uranium ore from any
30 source within the United States, including the ULP lease tracts, is strictly regulated by the NRC
31 under the terms of the AEA and the NRC regulations, which impose requirements that must be
32 satisfied before the NRC will grant a license to export any domestic uranium or uranium ore.
33 See AEA, 42 U.S.C. §§ 2099, 2151–2160d; NRC regulations, 10 C.F.R. §§ 110.19–110.46. For
34 example, 42 U.S.C. § 2099 forbids the NRC from licensing any person to export from the
35 United States any uranium ore, or other source material, if the issuance of such a license “would
36 be inimical to the common defense and security” or the health and safety of the public;
37 42 U.S.C. § 2155 gives the Executive Branch the authority to veto any export of uranium ore.
38 Many more specific requirements are imposed in the other above-cited provisions of the AEA
39 and the NRC regulations.

40

41 In addition, the possibility that uranium ore from the ULP may be subject to export, after
42 a prospective exporter goes through the process of applying for and receiving the necessary
43 permission from the NRC, does not undermine the stated purpose and need for agency action: to
44 support the AEA provisions which authorized and directed DOE to develop a supply of domestic
45 uranium, and to issue leases or permits for prospecting, exploration, mining, or removal of
46 deposits of uranium ore in lands belonging to the United States to the extent DOE deems

1 necessary to effectuate the provisions of the AEA (42 U.S.C. §§ 2096–2097). An active ULP
2 program will be more successful in meeting that need than would an inactive program.

- 3
- 4 • *Use the ULP lease tracts for generating renewable energy instead of uranium
5 ore production — Some commenters said they would prefer that the land
6 within the ULP lease tracts be used to generate renewable energy. They noted
7 that solar or wind resources were plentiful in the region and that DOE should
8 be doing more to promote renewables over nuclear energy. Commenters
9 noted that renewable energy resources such as solar and wind have less of an
10 impact on the region’s environment and the health of area residents.*

11

12 The evaluation of the use of the ULP land for development of solar energy or renewable
13 energy is outside the scope of the PEIS; and is not consistent with the “Purpose and Need”
14 discussed in Section 1.4 of the PEIS. However, surface use of a majority of the ULP land for
15 such purposes is not excluded by the ULP Program. Although out of scope in this PEIS, DOE
16 oversees numerous programs that are investigating and supporting a wide variety of energy
17 production technologies, including many based on renewable sources.

- 18
- 19 • *Although a long list of mitigation measures is presented in the ULP PEIS,
20 some are inadequate, and additional measures need to be included. The ULP
21 PEIS lacks a discussion on the effectiveness of the measures presented. It is
22 also not clear if some of these measures would be required and how they
23 would be implemented — Commenters pointed out that mitigation measures
24 identified in the ULP PEIS were inadequate or requested that additional
25 mitigation measures be added to the ULP PEIS. Several commenters said that
26 the buffer zone around the Dolores River was inadequate and requested that it
27 be expanded. Commenters noted several other mitigation measures that
28 needed to be strengthened or modified. For example, one commenter noted
29 that to mitigate radionuclides from blowing onto residences, it would be
30 necessary not only to cover the waste rock piles with soil but also to spray the
31 soil with water or some other barrier. Commenters were also concerned about
32 the enforceability of the mitigation measures. They noted that resources would
33 best be protected if lessees were required to undertake the identified
34 mitigation measures.*

35

36 As indicated in Section S.5, measures that are identified as compliance and mitigation
37 measures would be implemented because they are required by law (compliance measures) or
38 have been identified to minimize potential impacts (mitigation measures) as included in the
39 leases. The ULP PEIS also indicates that mitigation measures that are currently not in the leases
40 would be included as leases are modified. Implementation of the compliance and mitigation
41 measures would be under the oversight of the corresponding oversight agencies. DOE is
42 responsible for assuring that lease requirements are met and thus would enforce mitigation
43 measures in leases.

- 44
- 45 • *The cumulative impacts analysis does not cover enough area and does not
46 address some projects in the region of cumulative impacts, such as the oil and*

1 *gas wells present in the area. The conclusions or determinations of negligible*
2 *to minor potential cumulative impacts need to be re-evaluated — Many*
3 *commenters said that the cumulative impacts analysis was inadequate.*
4 *Commenters noted that some information was not included in the cumulative*
5 *impacts analysis, such as the impacts that could result from climate change*
6 *and oil and gas activities. Other commenters noted that the cumulative*
7 *impacts analysis did not address the impacts from the Piñon Ridge Mill.*
8 *Commenters said the ULP PEIS lacked a detailed cumulative impacts study;*
9 *excluded an investigation of long-term economic development, transportation*
10 *corridors, and public health; and failed to consider the combined impacts of*
11 *all past and present uranium activities in this region. Commenters requested*
12 *that these analyses be performed for the final issuance of the ULP PEIS.*
13

14 DOE has reviewed the analysis of cumulative impacts in light of these comments to
15 ensure that it is adequately comprehensive to provide a basis for informed, environmentally
16 sound decision making. GHG emissions would be small. Oil and gas projects within the 50-mi
17 (80-km) ROI considered in the PEIS are discussed and evaluated in Section S.6. Over 3,000
18 wells are located within the ROI studied. The cumulative impacts evaluation summarized in
19 Section S.6 included an analysis of all past and present uranium activities within the 50-mi
20 (80-km) ROI. The proposed Piñon Ridge Mill is also evaluated relative to cumulative impacts,
21 since it is within the 50-mi (80-km) ROI addressed in the PEIS.
22

23 Studies on long-term economic development, transportation corridors, and public health
24 as suggested by these commenters are not within the scope of this ULP PEIS. However, this ULP
25 PEIS does conservatively analyze the time frame for addressing the life-cycle of the proposed
26 action (i.e., considered the 10-year or longer time that mining activities could occur under the
27 lease terms), and it considers cumulative impacts from all reasonably foreseeable future actions
28 with the 50-mi (80-km) ROI under cumulative impacts.
29
30
31

1 **S.3 SCOPE OF THE ULP PEIS**

2
3 The ULP PEIS evaluates five alternatives for managing the ULP, for which there are
4 31 lease tracts located in Mesa, Montrose, and San Miguel Counties in western Colorado. These
5 alternatives address the range of reasonable options, which involve (1) terminating the leases and
6 conducting reclamation where needed, with DOE continuing to maintain oversight of the lands
7 without uranium leasing; (2) terminating the leases and conducting reclamation where needed,
8 relinquishing the lands for potential management by BLM and public domain lands, and
9 terminating the DOE ULP; and (3) continuing the ULP with associated exploration, mine
10 development and operations, and reclamation at some or all of the 31 lease tracts. At the time
11 that the ULP PEIS was being prepared, 29 of the 31 lease tracts were actively held under lease,
12 and the remaining 2 tracts had not been leased.

13
14 Of the 31 lease tracts, 11 are located in San Miguel County, 17 are located in Montrose
15 County, 2 are located in Mesa County, and 1 is located in both San Miguel and Montrose
16 Counties. The lease tracts vary in size from as small as 25 acres (10 ha) to as large as about
17 4,000 acres (1,600 ha).

18
19 The 29 active leases are held by five companies: (1) Golden Eagle Uranium, LLC;
20 (2) Cotter Corporation; (3) Gold Eagle Mining, Inc.; (4) Colorado Plateau Partners; and
21 (5) Energy Fuels Resources Corporation.

22
23 The ULP PEIS evaluates the three mining phases associated with the underground and
24 surface open-pit mining methods. These phases are the exploration phase, mine development and
25 operations phase, and reclamation phase. Resource areas evaluated are discussed in Chapter 2.
26 The evaluation discussed in the ULP PEIS incorporates site-specific information available
27 regarding the ULP lease tracts (e.g., current status, previous mining operations that occurred, and
28 other environmental information). In addition, as of now, there have been no new mine plans
29 (i.e., for exploration, mine development and operations, or reclamation) submitted to DOE by the
30 lessees; the location of where new, future, potential mining would take place and other
31 associated details are not currently known. Hence, the evaluation conducted in the ULP PEIS
32 also incorporates assumptions for developing a reasonable scenario that could represent an upper
33 bound level of possible future mining activity for each of the alternatives, as appropriate. These
34 assumptions are discussed in Chapter 2 of the ULP PEIS.

35 36 37 **S.3.1 Alternatives Evaluated in the ULP PEIS**

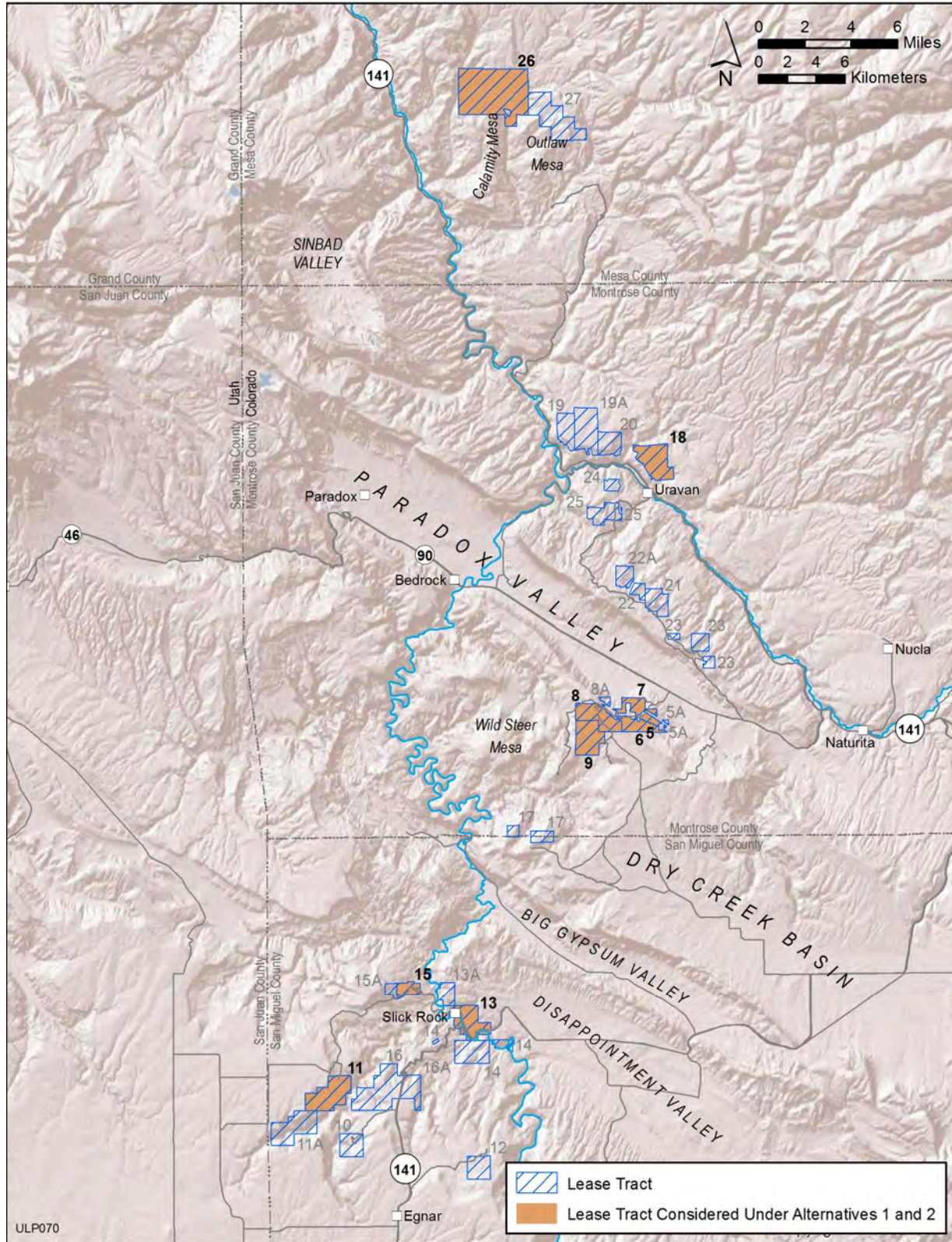
38
39 DOE developed the range of alternatives for determining how the ULP should be
40 managed by carefully considering the following: (1) the need for uranium reserves to support
41 energy development (consistent with the AEA and the Energy Policy Act of 2005); (2) other
42 mining issues; and (3) comments received during the public scoping period for the NOI
43 (76 FR 36097) to prepare the ULP PEIS. The five alternatives are as follows:
44

- 1 1. *Alternative 1:* DOE would terminate all leases, and all operations would be
2 reclaimed by lessees. DOE would continue to manage the withdrawn lands,
3 without uranium leasing, in accordance with applicable requirements.
4
- 5 2. *Alternative 2:* Same as Alternative 1, except once reclamation was completed
6 by lessees, DOE would relinquish the lands in accordance with
7 43 CFR Part 2370. If DOI/BLM determines, in accordance with that same Part
8 of the CFR, the lands were suitable to be managed as public domain lands,
9 they would be managed by BLM under its multiple use policies. DOE's
10 uranium leasing program would end.
11
- 12 3. *Alternative 3:* DOE would continue the ULP as it existed before July 2007,
13 with the 13 active leases, for the next 10-year period or for another reasonable
14 period, and DOE would terminate the remaining leases.⁴
15
- 16 4. *Alternative 4:* This is the preferred alternative under which DOE would
17 continue the ULP with the 31 lease tracts for the next 10-year period or for
18 another reasonable period.
19
- 20 5. *Alternative 5:* This is the No Action Alternative, under which DOE would
21 continue the ULP with the 31 lease tracts for the remainder of the 10-year
22 period, and the leases would continue exactly as they were issued in 2008.
23
24

25 **S.3.1.1 Alternative 1**

26
27 Alternative 1 would involve terminating the existing leases and conducting reclamation
28 as needed. Two of the 31 lease tracts are not leased. There are currently no ongoing operations
29 on any of the lease tracts, so no ongoing operations would need to be terminated. Reclamation
30 would need to be conducted at 10 of the 31 lease tracts. These 10 lease tracts (11, 13, 15, 5, 6, 7,
31 8, 9, 18, and 26) shown on Figure S.3-1 have areas that were disturbed in the past either for
32 exploration or from operations. Table S.3-1 presents a list of these lease tracts, the lessees, and
33 the approximate acreage that would have to be reclaimed at each lease tract. Existing structures
34 that would have to be removed during reclamation are also listed. Reclamation plans submitted
35 to DOE for review and approval would have to be consistent with CDRMS requirements.
36 CDRMS requires that reclamation plans take into account existing and planned structures before
37 a permit is issued. The reclamation of these structures is approved prior to the issuance of the
38 permit. Any changes not consistent with the approved plans would require a revision to the
39 CDRMS permit.
40
41

⁴ In July 2007, DOE issued a programmatic environmental assessment and Finding of No Significant Impact for the ULP, which a U.S. District Court invalidated on October 18, 2011.



1

2 **FIGURE S.3-1 Locations of Lease Tracts Evaluated under Alternatives 1 and 2**

1 **TABLE S.3-1 Lease Tracts Evaluated under Alternatives 1 and 2**

Lease Tract	Lease Tract Acreage ^a	Approximate Acreage of Mine Site Surface To Be Reclaimed	Structures That Need To Be Removed or Reclaimed	Lease Holder
5	151	7	Head frame, hoist house, vent fan, timbered ore bins	Gold Eagle Mining, Inc.
6	530	8	Two vent fans	Cotter Corporation
7	493	210	Small and large shop buildings, three water treatment ponds, 6,000-gal water tank, vent fan, substation	Cotter Corporation
8	955	5	None	Cotter Corporation
9	1,037	8	Shop building, four water treatment ponds, three vents, hoist house, pump house, substation	Cotter Corporation
11	1,303	5 ^b	Office trailer, 6,000-gal water tank	Cotter Corporation
13	1,077	8	Grated vent	Gold Eagle Mining, Inc.
15	350	1	None	Gold Eagle Mining, Inc.
18	1,181	4	Shop building, vent fan	Cotter Corporation
26	3,989	1	None	Energy Fuels
Total		257		

^a Indicates total acreage for the lease tract; only disturbed areas need to be reclaimed as listed in the next column.

^b In early November 2005, when the mine on Lease Tract 11 was shut down, Cotter Corporation had disturbed just less than 5 acres (2 ha) and had advanced the decline approximately 330 ft (100 m). The development of the decline created a small mine waste-rock dump at the site, which is how conditions remain to date.

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After the leases were terminated and reclamation was completed, DOE would continue to manage the withdrawn lands and not lease these lands for uranium mining purposes. Under Alternative 1, after reclamation was complete, essentially no activity would occur on the lease tracts aside from continued maintenance to ensure conditions would remain consistent with Federal, state, and local requirements. Surface rights would continue to be held by the BLM, and current activities approved or permitted by the BLM would continue under BLM oversight.

1 **S.3.1.2 Alternative 2**

2
3 Under this alternative, the same 29 leases addressed in Alternative 1 would be
4 terminated. The primary difference between Alternative 1 and 2 is that under Alternative 2, after
5 reclamation was completed by the lessees on the 10 lease tracts listed in Table S.3-1 and shown
6 on Figure S.3-1, DOE would relinquish all the withdrawn lands for potential management by
7 BLM in accordance with 43 CFR § 2372.3. DOE's uranium leasing program would end.
8

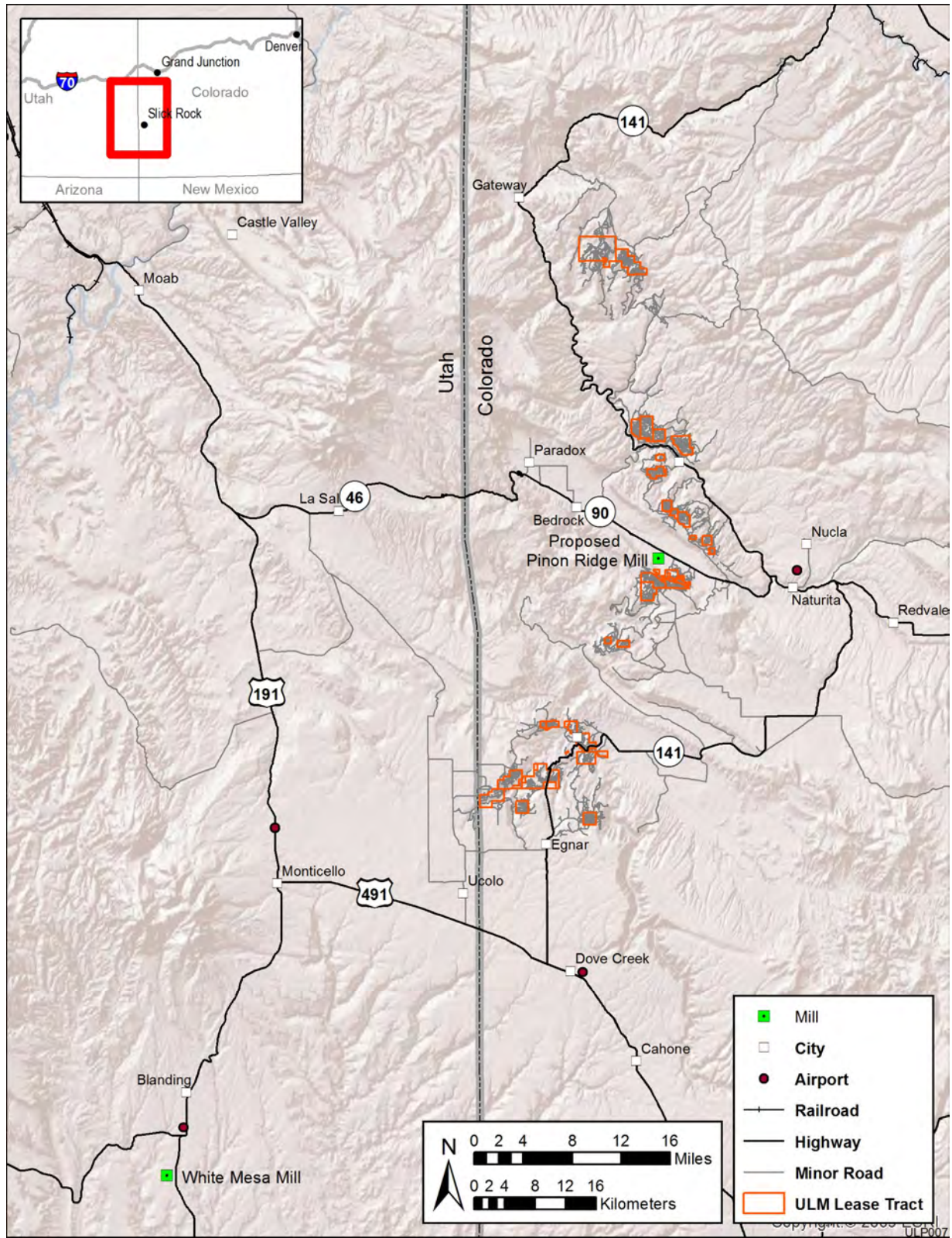
9 Under BLM management, private parties could establish new mining claims under the
10 1872 mining law. The potential impacts from any future potential uranium mining under BLM
11 management would likely be similar to those discussed in the ULP PEIS (e.g., those discussed
12 for Alternatives 3 through 5, depending on the level of mining activity). If BLM determines that
13 the relinquished lands cannot be managed as public domain lands, the General Services
14 Administration would evaluate potential management and disposition options.
15
16

17 **S.3.1.3 Alternative 3**

18
19 Under Alternative 3, DOE would continue with exploration, mine development and
20 operations, and reclamation at the 13 lease tracts for which leases existed prior to July 2007. The
21 leases on the remainder of the lease tracts would be terminated. The 13 leases before July 2007
22 were on Lease Tracts 5, 6, 7, 7A, 8, 9, 11, 13, 13A, 15, 18, 21, and 25. Lease Tracts 7 and 7A
23 (separate tracts at that time) were since combined (February 2011) into Lease Tract 7 (held by
24 Cotter Corporation). The lease tracts, which now number 12 (as shown in Figure S.3-2), either
25 have approved exploration drill holes and/or have existing inactive mines or permits for new
26 underground mines. Of the 12 lease tracts, 9 are leased to Cotter Corporation, and the remaining
27 3 are leased to Gold Eagle Mining, Inc. Table S.3-2 presents a list of the lease tracts evaluated
28 under Alternative 3. Other relevant information about these lease tracts is also presented.
29

30 This alternative assumes future mine development and operations would occur on the
31 12 lease tracts for the next 10 years or for another reasonable period of time, with subsequent
32 reclamation to be conducted after the operations were considered complete. Leases could be
33 extended after the 10-year period was met. Under this alternative, it is expected that all mines to
34 be developed at the 12 lease tracts would be underground mines, with the exception of Lease
35 Tract 7, where an open-pit mine currently exists and would likely be operated. This expectation
36 is consistent with the current status of the 12 leases summarized in Table S.3-2. Notwithstanding
37 the existing, permitted mines located on the lease tracts (that would be expected to resume
38 operations), no new project-specific plans have been submitted to DOE by the lessees.
39 Accordingly, for the purposes of the analyses for the ULP PEIS, additional assumptions have
40 been developed to form the basis of the impacts analyses for Alternative 3.
41

42 It is assumed that activities associated with the exploration phase would be minor, given
43 that at all 12 lease tracts involved under Alternative 3 contain existing permitted mines or have
44 been the subject of exploration activities. However, assumptions for potential new exploration
45 activities were developed to provide the basis for the evaluation in the ULP PEIS. It is assumed
46 that the total disturbed surface area for the exploration of the assumed new two small mines,



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FIGURE S.3-2 Locations of Lease Tracts Evaluated under Alternative 3

1 **TABLE S.3-2 Lease Tracts Evaluated under Alternative 3**

Lease Tract	Acreage	Location (County)	Lessee	Current Status
5	151	Montrose	Gold Eagle Mining, Inc.	One existing permitted underground mine
6	530	Montrose	Cotter Corporation	One existing permitted underground mine
7	493	Montrose	Cotter Corporation	Two existing permitted mines: one underground and one very large open pit mine
7A ^a	–	–	–	–
8	955	Montrose	Cotter Corporation	One existing permitted underground mine
9	1,037	Montrose	Cotter Corporation	One existing permitted underground mine
11	1,303	San Miguel	Cotter Corporation	New permit for one underground mine yet to be developed
13	1,077	San Miguel	Gold Eagle Mining, Inc.	Three existing permitted underground mines
13A	420	San Miguel	Cotter Corporation	Exploration of one hole approved; drilling and reclamation of the explored area completed
15	350	San Miguel	Gold Eagle Mining, Inc.	One existing permitted underground mine
18	1,181	Montrose	Cotter Corporation	One existing underground mine
21	651	Montrose	Cotter Corporation	Exploration of two holes approved; drilling and reclamation of the explored area completed
25	639	Montrose	Cotter Corporation	Exploration of one hole approved; drilling and reclamation of the explored area completed

^a Lease Tract 7A, which existed in 2007, was combined with Lease Tract 7 in February 2011.

2
3

1 four medium mines, and one large mine would be about 0.11 acre (0.04 ha), 0.44 acre (0.17 ha),
2 and 0.17 acre (0.06 ha), respectively. The disturbed area for the existing very large open-pit mine
3 (the JD-7 mine) is about 210 acres (80 ha). It is further assumed that the total number of workers
4 for the exploration phase for Alternative 3 is eight workers.
5

6 In addition, a “peak year” of activity representing a reasonable upper-bound level of
7 activity was analyzed in order to provide conservative yet reasonable estimates for Alternative 3,
8 addressing impacts that could result from the largest number of mines that could be operated at
9 the same time. The peak year could occur more than once; that is, there could be multiple years
10 with the same number of mines operating at similar ore production rates. It is also reasonable to
11 expect that there would be a smaller number of mines in operation or that ore production could
12 be less in the years other than the peak year(s). Uranium ore from some of the mines could be
13 exhausted before the 10-year lease period, and operations at these mines could end sooner than
14 the 10-year lease period. The potential impacts for years other than the peak year(s) would fall
15 within the range of impacts discussed in the ULP PEIS and summarized in Section S.4. For
16 Alternative 3, the potential impacts for the entire 10-year lease period would be expected to be
17 no more than 10 times those for the peak year, if it is conservatively assumed that all 10 years of
18 mining operations are consistent with the assumptions for the peak year discussed here.
19

20 Given that State of Colorado permits have already been obtained for most of the lease
21 tracts and given that these permits remain in effect, the peak year of operations for Alternative 3
22 could occur as early as year 5 or 6 after the first mine development commenced. The lessees
23 would have to submit a plan to DOE for review and approval. For existing mines on some of the
24 lease tracts, however, operations could resume sooner and simultaneously; this could result in a
25 peak year that would occur sooner. There could be several peak years, depending on how much
26 ore was available on the lease tracts. It is also expected that some of the mines would be
27 terminated before others, depending on the availability of ore deposits. A 10-year lease period
28 would allow for, on average, about 6 years of operations for each of the mines, and that amount
29 of time might or might not be enough to exhaust the ore that would be available, depending on
30 the lease tracts. However, under Alternative 3, the lease period for a given lease could be
31 extended beyond the 10-year period for another reasonable period, which would then allow
32 additional time for mining operations.
33

34 Other assumptions made to estimate potential impacts from this alternative include the
35 tonnage that would be generated by each mine, the size of the surface area that would be
36 disturbed by each mine, the number of workers needed, and the amount of water needed for each
37 mine. (It is assumed that this water would be trucked into the work site and used as potable
38 water, for showers, and for other activities such as dust control.) For Alternative 3, it is assumed
39 that in addition to the two retention pond systems that currently exist at ULP mine sites (located
40 at medium-size mines at Lease Tracts 7 and 9), an additional two new retention pond systems
41 could be utilized for the new mines. Potential future mining operations at Lease Tracts 8 and 13
42 could encounter water that might need to employ retention pond systems. These ponds are
43 primarily intended to capture surface water and prevent sediment from entering nearby streams
44 and drainages. The pond volumes are between 330,000 gal (about 1 acre-ft) and 470,000 gal
45 (about 1.5 acre-ft) with discharge rates of between 160,000 gal/mo (0.5 acre-ft/mo) to

1 280,000 gal/mo (0.86 acre-ft/mo). These assumptions are generally based on past uranium
2 mining experiences in the area.

3
4 While the existence of ore stockpiles during active mining operations is expected, the
5 duration is not expected to affect human health and the environment. The Colorado State
6 regulations prohibit the stockpiling of ore at the mine sites for more than 180 days.

7
8 For the reclamation phase, a workforce of 29 workers would be employed for a 1-year
9 period to perform the reclamation field work for a peak year. It is assumed that a team of
10 five workers would be employed for about 3 to 4 months (adjusting for seasonal considerations)
11 to conduct the reclamation needed per lease tract. Hence, three teams of five workers each are
12 assumed for the reclamation of the nine lease tracts, excluding the JD-7 mine. It is assumed that
13 an additional 14 workers would work on the reclamation of the JD-7 mine for 1 year. The peak
14 year of reclamation has been analyzed to address a reasonable upper-bound scenario to provide a
15 conservative estimate of potential impacts; however, it is expected that reclamation would be
16 conducted for a given lease tract when mining operations were considered complete. Similar to
17 Alternatives 1 and 2, it is assumed that field work associated with reclamation would be
18 conducted during daytime work hours. Reclamation undertaken for Alternative 3 would require
19 the same types of equipment as those discussed for Alternatives 1 and 2.

20 21 22 **S.3.1.4 Alternative 4**

23
24 All 31 lease tracts (see Table S.1-2) are assumed to be available for potential exploration
25 and mining of uranium ores under Alternative 4. Leases on the ULP lease tracts would be
26 continued for the next 10 years or for another reasonable period, as appropriate. As discussed
27 previously in Section S.1.2, Lease Tract 8A and Lease Tract 14 (i.e., Parcels 14-1, 14-2, and
28 14-3) are currently not leased. Lease Tract 8A is a small tract that is isolated and may be located
29 entirely below or outside the uranium-bearing formation, which could indicate a lack of ore.
30 Lease Tract 14 is composed of three parcels (14-1, 14-2, and 14-3). There was some interest in
31 Parcels 14-1 and 14-2 by potential lessees in the past; however, the third parcel (14-3, which lies
32 east of 14-1) is located almost entirely within the Dolores River corridor and was never leased.
33 The leases stipulate that no new mining activity could be conducted within 0.25 mi (0.4 km) of
34 the Dolores River.

35
36 As is the case for Alternative 3, no new project-specific plans have been submitted to
37 DOE by the lessees with regard to where and how many mines might be developed and operated
38 in the near future. For the purposes of the analyses for the ULP PEIS, various assumptions have
39 been developed to form the basis of the impact analyses for Alternative 4.

40
41 It is assumed that there would be a total of 19 mines operating at various production rates
42 at the same time during what would be considered the peak year of operations. That is, the
43 19 mines would comprise 6 small, 10 medium, 2 large, and 1 very large (open-pit JD-7 mine).
44 Similar to Alternative 3, it is further assumed for Alternative 4 that there would be a smaller
45 number of mines in operation in the years other than the peak year, and that this peak year could
46 occur more than once (i.e., there could be multiple years with the same number of mines

1 operating at similar ore production rates). It is expected that the potential impacts for years other
2 than the peak year(s) would fall within the range of impacts discussed in the ULP PEIS as
3 summarized in Section S.4. Similar to Alternative 3, the potential impacts for the entire 10-year
4 lease period would be expected to be no more than 10 times those for the peak year, if the
5 assumptions for all 10 years of the operations would be the same as those for the peak year
6 discussed here.

7
8 The peak year could occur as early as the seventh year after operations began, for each of
9 the five companies holding the leases. It is assumed that each company would begin mine
10 development and operations at one mine at a time, with the second mine being developed about
11 8 months after the first one, and so on, until the entire number of mines planned to operate at the
12 same time would be in operation. It is also likely that the ore for some of the mines would be
13 exhausted after several years (e.g., the resources for the mines that were placed into operation
14 first could be exhausted after 6 years, so the potential impacts for the years before and after the
15 peak year[s] would be less). This assumption allows for 2 to 3 years to obtain permits and
16 approvals for plans submitted.

17
18 For the exploration phase for Alternative 4, it is assumed that a total of 0.33 acre
19 (0.13 ha), 1.1 acre (0.44 ha), and 0.33 acre (0.13 ha) of surface would be disturbed for the new
20 6 small, 10 medium, and 2 large mines assumed, respectively. For the very large mine, 210 acres
21 (92 ha) has already been disturbed at the JD-7 surface open-pit mine. A total of 20 workers
22 would be required to conduct the exploration phase for the number of mines assumed for
23 Alternative 4 (not including the very large open-pit mine at JD-7, for which exploration is
24 assumed to have been completed).

25
26 The total area disturbed for Alternative 4 is 460 acres (190 ha). This acreage should
27 remain the same through the life of Alternative 4. Total tonnage of ore generated for the peak
28 year of operation would be about 480,000 tons. The number of workers needed for mine
29 development and operations would depend on the size of the mine and could vary from 7 to
30 51 workers. It is assumed that 7, 11, 17, and 51 workers would be needed for each small,
31 medium, large, and very large mine, respectively. These workers would consist mostly of mine
32 workers.

33
34 Equipment needed for mine development and operations would include both underground
35 and surface equipment. The equipment includes diesel skid-steer loaders, diesel trucks or
36 buggies, development drills, production drills, exploration drills, backhoes, highway haul trucks,
37 scrapers, and power generators. The items of equipment needed for mine development and
38 operations at the one very large mine evaluated (the JD-7 surface open-pit mine on Lease
39 Tract 7) would be different than those needed for the underground mines assumed under this
40 alternative; primarily surface equipment (e.g., front-end loaders, bulldozers, dump trucks, and
41 backhoes) would be needed at Lease Tract 7. Water would also be needed and would be trucked
42 in. The annual amount of water needed for the 19 mines assumed for Alternative 4 would be
43 about 6,300,000 gal (19 ac-ft). Similar to the discussion in Section 2.2.3.1 for Alternative 3,
44 retention ponds would be used to capture surface water and prevent sediment from entering
45 nearby streams and drainages. For Alternative 4, as many as four retention ponds are assumed

1 for the peak ULP mining activities with similar pond volumes and discharge rates discussed in
2 Section 2.2.3.1.

3
4 Reclamation of the mine operations for Alternative 4 would involve 39 workers over the
5 course of a peak year. It is also assumed that there would be a waiting period of about 1 or
6 2 years to account for following up on the revegetation and obtaining the necessary release and
7 approval from the state.

8
9 Current expectations indicate that most, if not all, of the mines would be underground,
10 with the exception of the JD-7 mine on Lease Tract 7, which is a surface open-pit mine.

11 12 13 **S.3.1.5 Alternative 5**

14
15 The primary difference between Alternatives 4 and 5 is that the leases for Alternative 5
16 would be for the remainder of the 10-year period and would continue exactly as they were in
17 2008. This is the No Action Alternative and reflects the current status for the management of the
18 ULP. The ULP is administering the 29 leases that existed in 2008. So far, the 10-year period for
19 these leases has been extended for a time period equivalent to the time taken to prepare and
20 complete the ULP PEIS. It is currently projected that the leases would be extended by about
21 3 years, which means that instead of expiring in 2018, as originally stipulated, the leases would
22 now be expiring in 2021. The lease tracts are listed in Table S.1-2.

23
24 It is assumed that because the lease period for Alternative 5 is shorter than that for
25 Alternative 4, a similar number of mines could be operated in a peak year, but to increase ore
26 production, individual mines would be larger (e.g., there would be more medium mines and no
27 small mines). This would enable the production of as much uranium ore as reasonable within the
28 shorter time frame of Alternative 5. That is, 16 medium, 2 large, and 1 very large (the open-pit
29 JD-7 mine) constitute the 19 mines assumed for Alternative 5. The total amount of ore generated
30 for Alternative 5 for the peak-year operations would be about 552,000 tons. The total area
31 disturbed for Alternative 5 is 490 acres (200 ha). This acreage should remain the same through
32 the life of Alternative 5. Annual water usage would be about 8,000,000 gal (25 ac-ft).
33 Assumptions associated with the exploration and reclamation phases are generally the same as
34 those for Alternative 4.

35 36 37 **S.3.2 Preferred Alternative**

38
39 DOE's preferred alternative for the management of the ULP is Alternative 4. DOE would
40 continue to allow, after appropriate NEPA analysis, the exploration, mine development and
41 operations, and reclamation of uranium mines on the 31 lease tracts that are being managed
42 under the DOE ULP. As stated in previous sections, the primary difference between
43 Alternative 4 (the preferred alternative) and Alternative 5 (the No Action Alternative for the
44 Draft ULP PEIS) is the lease period associated with these alternatives. Under Alternative 4, the
45 lease period would be for the next 10 years or for another reasonable period; under Alternative 5,
46 the lease period would be for the remainder of the 10-year period stipulated in the leases

1 executed in 2008. Hence, the number of years available for ore generation would be shorter
2 under Alternative 5 and might not give the lessees enough flexibility to time their mining
3 activities to coincide with periods when the economic market for uranium ore was favorable. The
4 shorter period of time associated with Alternative 5 could also mean that the ore in some of the
5 mines might not be exhausted by the time the lease(s) expired, resulting in the premature
6 shutdown of activities, termination, and reclamation.
7

8 The comparison and summary of potential impacts in Section S.4 indicates that in
9 general, the potential impacts from Alternative 4 would be similar to those from Alternative 5.
10 The exception is that it is assumed that a slightly greater quantity of ore would be generated each
11 year under Alternative 5. This assumption was made to simulate conditions in which the lessees
12 would expedite ore production by operating medium-sized to large mines (and not any small
13 mines, which are considered under Alternative 4). The slightly higher amount of ore generated
14 under Alternative 5 would result in potential impacts slightly greater than those under
15 Alternative 4.
16

17 Potential impacts from reclamation activities would be similar under all the alternatives,
18 1 through 5. Potential impacts under Alternatives 1 and 2 would result only from reclamation.
19 Potential impacts from mine operations would be slightly less under Alternative 3 than under
20 Alternative 4 because it is assumed that fewer mines (with fewer leases—12 versus 31) would be
21 operated under Alternative 3. The assumptions developed for Alternative 4 are considered more
22 realistic based on historical experience and on the outlook for future uranium mining in the area.
23
24

25 **S.3.3 Alternatives Considered but Not Evaluated in Detail**

26

27 DOE identified the range of alternatives for detailed analysis based on the purpose and
28 need for agency action described in PEIS Section 1.4.
29

30 DOE has focused the ULP PEIS on its authority to manage the leasing of land with
31 known uranium resources withdrawn under AEA PLO 459. The extracted ore would later be
32 converted, enriched, and fabricated into nuclear fuel; used in commercial reactors; possibly
33 reprocessed; and ultimately result in the generation of various radioactive wastes requiring
34 specialized disposal. The ULP PEIS does not discuss the impacts of these actions. The quantity
35 of uranium available on the DOE ULP lease tracts (estimated to be 13.5 million lb, or
36 6.1 million kg) represents approximately only 1.5% of the available domestic uranium reserves
37 (nearly 900 million lb, or 410 million kg). These domestic reserves represent approximately 7%
38 of the world's known uranium reserves. No decisions to be made under the ULP would affect
39 environmental impacts from the use of uranium, including the management of the back end of
40 the nuclear fuel cycle. All components of the nuclear fuel cycle will continue to be addressed by
41 proposal-specific and site-specific environmental analyses by the appropriate governmental
42 entity.
43

44 There is no need to evaluate the in situ leaching method for mining uranium in the ULP
45 PEIS because it is not considered to be a viable option due to the location of the ore in "dry"
46 sedimentary strata. The in situ leaching method is not suitable considering the geology of the

1 DOE ULP area and the manner in which the uranium ore is located on the lease tracts. The
2 uranium ore at the DOE ULP lease tracts is expected to be deposited along roll fronts following
3 stream bends. The ISL method would require that the ore be located within areas where
4 groundwater is present in relative abundance, which is not the case at the DOE ULP lease tracts.
5 In addition, past mining operations on the lease tracts have been primarily underground (and
6 current permits have been primarily for underground mining).
7
8

9 **S.3.4 Summary of Changes to the Draft PEIS**

10
11 This PEIS contains two new appendices: Appendix E and I. Appendix E presents the BA
12 prepared for consultation with the USFWS and the BO that was issued by the USFWS.
13 Appendix E had previously presented species accounts for species listed under the Endangered
14 Species Act, and it is now material that is also discussed in the BA or Section S.4. Appendix I
15 presents the comment response document or CRD and contains a discussion of the public
16 participation process conducted for the Draft ULP PEIS, a summary of changes made to the
17 Draft ULP PEIS to generate the Final ULP PEIS, a discussion on the nine topics of interest
18 gleaned from the public comments received on the Draft ULP PEIS (as summarized in
19 Section S.2.2.1), and, finally, the comments received with the corresponding responses.
20

21 In addition to the two new appendices, other changes were made to the ULP PEIS as a
22 result of comments received to clarify, add to, or correct the information that was presented in
23 the Draft ULP PEIS. Revisions made to the Draft ULP PEIS to prepare the Final ULP PEIS and
24 the Summary (this document) are identified with a line on the right margin of the pages.
25 However, this same approach (i.e., providing lines on the right margin of the pages) to indicate
26 new material was not done for the two new appendices in the PEIS; instead, the reader is
27 informed of this in the introductory text for the given appendices. The following summarizes the
28 changes made for the Final PEIS (as also reflected in corresponding sections of this Summary):
29

- 30 • In response to comments, additional site-specific information about past
31 operations on the lease tracts was added (see Section S.1.3).
32
- 33 • Text describing the Purpose and Need for agency action (see Section S.1.4)
34 was clarified.
35
- 36 • Additional site-specific information available after the draft was issued was
37 incorporated into the analysis (as summarized in S.4). The source documents
38 were cited and added to the reference list. No substantive changes to the PEIS
39 analysis resulted from the additional site-specific information.
40
- 41 • Text was added to require, at a minimum, an environmental assessment to be
42 completed before approval of any mining plan (see Section S.2). This revision
43 was made in response to public concerns that a NEPA review with public
44 participation would not be completed as future mine plans are being
45 considered.
46

- 1 • The Final BA and the BO for the ESA consultation were completed after the
2 Draft PEIS was issued and, hence, were added to Final PEIS in an appendix
3 (Appendix E) along with pertinent information from these documents.
4
- 5 • Text was revised to provide clarifications on technical discussions pertaining
6 to human health, surface water, and cultural resource protection, based on
7 discussion with the EPA and BLM in their capacity as cooperating agencies.
8
- 9 • Text was added describing the development of a Programmatic Agreement or
10 PA to manage the process for evaluating and protecting cultural resources that
11 could be impacted by the ULP (see Section S.1.7). The PA is under
12 development and will be completed before the ROD for the ULP PEIS.
13
14
15

S.4 SUMMARY AND COMPARISON OF POTENTIAL ENVIRONMENTAL IMPACTS

Table S.4-1 provides the intended meaning of the qualitative terms used to describe the levels of potential impact for the various resources evaluated in the ULP PEIS. Tables S.4-2 through S.4-7 describe the potential impacts from the five alternatives evaluated for each of the environmental resource areas and human health. Measures identified to minimize the potential impacts summarized in this section are identified in Section S.5. Potential impacts from the five alternatives are considered in combination with impacts of past, present, and reasonably foreseeable future actions in the cumulative impacts evaluation summarized in Section S.6.

The potential impacts from the five alternatives for the various resource areas indicate that the potential impacts are generally negligible to moderate and that Alternative 5 could result in the highest potential impacts of all the alternatives, primarily because the assumptions used as basis for the analysis require the most activities, area of disturbance, ore tonnage generated, and water utilized.

TABLE S.4-1 Meaning of Qualitative Terms Used To Describe Potential Impact Levels

Resource/System	Impact Level			
	Negligible	Minor	Moderate	Major
Air quality	No measurable impacts.	Most impacts on affected resource could be avoided with proper mitigation. If impacts occur, the affected resource would recover completely without mitigation once the impacting stressor is eliminated.	Impacts on the affected resource are unavoidable; the viability of the affected resource is not threatened, and would recover completely if proper mitigation is applied or proper remedial action is taken once the impacting stressor is eliminated.	Impacts on the affected resource are unavoidable; the viability of the affected resource may be threatened, and the affected resource would not fully recover even if proper mitigation is applied or remedial action is implemented once the impacting stressor is eliminated.
Acoustic environment	Same as for air quality.	Same as for air quality.	Same as for air quality.	Same as for air quality.
Soil resources	Same as for air quality.	Same as for air quality.	Same as for air quality.	Same as for air quality.
Water resources	Same as for air quality.	Same as for air quality.	Same as for air quality.	Same as for air quality.

19

TABLE S.4-1 (Cont.)

Resource/System	Impact Level			
	Negligible	Minor	Moderate	Major
Human health	Potential impacts are calculated and results compared to appropriate regulatory limits or guidelines.	Potential impacts are calculated and results compared to appropriate regulatory limits or guidelines.	Potential impacts are calculated and results compared to appropriate regulatory limits or guidelines.	Potential impacts are calculated and results compared to appropriate regulatory limits or guidelines.
Ecological resources ^a	Same as for air quality.	Same as for air quality.	Same as for air quality.	Same as for air quality.
Land use	No measurable impacts.	Adverse impacts on the affected activity, community, or resource could be avoided with proper mitigation. Impacts would not disrupt the normal or routine functions of the affected activity, community, or resource. The affected activity, community, or resource would return to a condition of no measurable effects once the impacting stressor is eliminated.	Impacts on the affected activity, community, or resource are unavoidable. Proper mitigation would reduce impacts substantially during the life of the project. A portion of the affected activity, community, or resource would have to adjust somewhat to account for disruptions due to impacts of the project. The affected activity, community, or resource would return to a condition of no measurable effects once the impacting stressor is eliminated.	Impacts on the affected activity, community, or resource are unavoidable. Proper mitigation would reduce impacts substantially during the life of the project. Resources could incur long-term effects or unavoidable disruptions to a degree beyond what is normally acceptable. The affected activity, community, or resource would return to a condition of no measurable effects once the impacting stressor is eliminated.
Socioeconomics	Same as for land use.	Same as for land use.	Same as for land use.	Same as for land use.
Environmental justice	Same as for land use.	Same as for land use.	Same as for land use.	Same as for land use.

TABLE S.4-1 (Cont.)

Resource/System	Impact Level			
	Negligible	Minor	Moderate	Major
Transportation ^b	Radiological impacts are governed by regulations and were found to be negligible. Traffic accident injuries and fatalities are proportional to the distance travelled, with no fatalities expected under any alternative. One potential traffic injury could occur under some alternatives.	Radiological impacts are governed by regulations and were found to be negligible. Traffic accident injuries and fatalities are proportional to the distance travelled, with no fatalities expected under any alternative. One potential traffic injury could occur under some alternatives.	Radiological impacts are governed by regulations and were found to be negligible. Traffic accident injuries and fatalities are proportional to the distance travelled, with no fatalities expected under any alternative. One potential traffic injury could occur under some alternatives.	Radiological impacts are governed by regulations and were found to be negligible. Traffic accident injuries and fatalities are proportional to the distance travelled, with no fatalities expected under any alternative. One potential traffic injury could occur under some alternatives.
Cultural resources	Same as for land use.	Same as for land use.	Same as for land use.	Same as for land use. All of the affected resource would be permanently damaged or destroyed.
Visual resources ^c	<i>No contrast:</i> The contrast is technically visible but unlikely to be seen by the casual observer and unlikely to create discernible contrast.	<i>Weak contrast:</i> The contrast is unlikely to be seen by the casual observer but is noticeable to those who look closely at the affected area.	<i>Moderate contrast:</i> The contrast is likely to be seen by anyone but does not strongly attract and hold visual attention.	<i>Strong contrast:</i> The contrast is strong enough to attract and hold visual attention and may dominate the view.

^a Ecological resources include vegetation, wildlife, aquatic biota, and threatened, endangered, and rare species. For most biota, these levels are based on population-level impacts rather than impacts on individuals. For species listed under the ESA, the impact levels consider impacts on individuals, when appropriate, as well as on populations. Impacts on species listed under the ESA are discussed using impact levels consistent with determinations made in ESA Section 7 consultation with the USFWS.

^b Radiological transportation impacts are quantified based on the latest scientific knowledge regarding radiation and human health, to aid in understanding the general level of potential risks, but the assignment of cutoff or significance levels is not appropriate. The same is true for potential injuries and fatalities as a result of potential traffic accidents.

^c The analysis for visual resources focuses on the potential level of visual contrast (i.e., changes in form, line, color, and texture as compared to the existing or baseline condition) that would occur as a result of mining-related activities on the lease tracts. For this analysis, contrast is characterized as either nonexistent (i.e., no contrast), moderate, weak, or strong—terms that roughly approximate the four-level classification scheme presented in the table.

TABLE S.4-2 Comparison of the Potential Impacts on Air Quality, the Acoustic Environment, and Soil Resources from Alternatives 1 through 5

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Air Quality ^a	Potential impacts on ambient air quality anticipated to be minor and temporary in nature. It is estimated that PM ₁₀ emissions would be about 0.92% of emission totals for the three counties and NO _x emissions would be about 0.09% of the three-county totals.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	<p>Potential impacts from the exploration phase would be minimal and temporary in nature.</p> <p>Peak-year emission rate estimates would be small during mine development and operations compared with the emission totals for the three counties. PM₁₀ and PM_{2.5} emissions could contribute about 1.5% and 0.66% of the three county total, respectively. NO_x emissions could be highest during operations, contributing about 1% of the three-county total emissions.</p> <p>During reclamation, PM₁₀ emissions could be highest, at about 0.98% of the three-county total emissions.</p>	<p>Similar to Alternative 3 in that potential impacts from the exploration phase would be minimal and temporary in nature.</p> <p>Peak-year emission rates would be small during mine development and operations compared with the emission totals for the three counties. PM₁₀ and PM_{2.5} emissions could contribute about 3.0% and 1.3% of the three-county total, respectively. Estimates indicate NO_x emissions would contribute about 2% of the three-county total emissions.</p> <p>During reclamation, PM₁₀ emission estimates could be highest at about 1.1% of the three-county total emissions.</p>	<p>Peak-year mine development and operations emission rates are estimated to be higher than those under Alternative 4. PM₁₀ and PM_{2.5} emissions could contribute about 3.2% and 1.4% of the three-county total, respectively. NO_x emissions would contribute about 2.3% of the three-county total.</p> <p>During reclamation, PM₁₀ emission estimates could be highest at about 1.1% of the three-county total emissions.</p>

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2

3

TABLE S.4-2 (Cont.)

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Acoustic Environment	Noise levels would attenuate to about 55 dBA (the Colorado daytime maximum permissible limit) at a distance of 1,650 ft (500 m) from the reclamation sites. Most area residences are located beyond this distance. However, if reclamation activities were conducted near the boundary of Lease Tract 13, noise levels at nearby residences could exceed the Colorado limit.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Noise impacts during the exploration phase on neighboring residences or communities would be minimal and intermittent in nature. During mine development and operations, noise levels at about 55 dBA and 50 dBA (Colorado nighttime limit) would be limited to distances of 1,650 ft (500 m) from the mine sites and 230 ft (70 m) from the haul routes, respectively. Most area residences are located beyond these distances. If activities were conducted near the boundary of Lease Tract 13, noise levels at nearby residences could exceed the Colorado limit. For reclamation, some unavoidable but localized short-term and minor noise impacts on neighboring residences or communities could occur.	Noise impacts for the three phases would be similar to those from Alternative 3. Activities conducted near Lease Tracts 13, 13A, 16, and 16A could exceed the Colorado daytime limit of 55 dBA. In addition, noise from haul trucks could exceed the Colorado nighttime limit of 50 dBA within 350 ft (107 m) from the haul route, and possibly any residences within this distance could be affected.	Similar to Alternative 4, except Colorado nighttime limit exceedance from haul trucks within 380 ft (120 m) from the haul route.

TABLE S.4-2 (Cont.)

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Soil Resources	Ground disturbances from reclamation activities could result in minor impacts due to soil compaction, soil horizon mixing, soil contamination (from oil and fuel releases related to use of trucks and other equipment), and soil erosion.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Ground disturbances from mining-related activities could result in minor impacts due to soil compaction, soil horizon mixing, soil contamination (from oil and fuel releases related to use of trucks and other equipment), and soil erosion. Potential impacts from Alternative 3 would likely be greater than those from Alternative 1 since there would be impacts from mine development and operations, which would also be conducted.	Potential impact could be greater than that from Alternative 3 since more mines would be developed and operated.	Similar to Alternative 4.

^a PM₁₀ = particulate matter with a mean diameter of 10 µm or less; for PM_{2.5}, it is 2.5 µm or less. NO_x = nitrogen oxides.

1 **TABLE S.4-3 Comparison of the Potential Impacts on Water Resources, Land Use, and Waste Management from Alternatives 1**
 2 **through 5**

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Water Resources	Of the 10 lease tracts evaluated for Alternative 1, reclamation activities on Lease Tract 13 have the greatest potential to affect surface water resources due to the proximity to the Dolores River. The potential impacts due to the backfill materials and poor sealing of drill holes could occur only in Lease Tracts 7, 9, and 13, and would be minor. Impacts generally would be avoided or minimized by implementation of reclamation performance standards set by the CDWR.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Potential impacts (i.e., runoff generation and erosion) associated with exploration would be minor due to the small spatial extent involved. Potential impacts of groundwater mixing and leaching via exploratory drill holes could occur in a few lease tracts only (i.e., Lease Tracts 7, 9, and 13), and would be minor. For mine development and operations, activities on lease tracts closest to the Dolores River and San Miguel River (i.e., Lease Tracts 13 and 18) pose the greatest potential to affect water quality because of erosion. Potential groundwater contamination impacts and dewatering effects would be minor in a few lease tracts (i.e., Lease Tracts 7, 9, and 13). However, a limited number of existing domestic water wells, associated with Lease Tracts 7, 9, and 13, would be potentially affected if local groundwater is contaminated or aquifers are dewatered. Impacts from reclamation activities would be greater than those for Alternative 1.	Similar to the type of potential impacts under Alternative 3, potential impacts associated with exploration (i.e., runoff generation and erosion) would be minor due to the small spatial extent involved. Potential impacts of groundwater mixing and leaching via exploratory drill holes could occur in a few lease tracts only (i.e., Lease Tracts 7, 9, and 13), and would be minor. Also, mine development and operations on the lease tracts closest to the Dolores River and San Miguel River (e.g., Lease Tracts 13 and 18) would have the greatest potential to affect water quality because of erosion. Potential groundwater contamination impacts and dewatering effects could occur in a few lease tracts only (i.e., Lease Tracts 7, 9, 13, and possibly 8A), and would be minor. The number of domestic wells that might be affected is similar to Alternative 3, and they could be associated with Lease Tracts 5, 6, 8, 13, 16, and 18 only. Impacts from reclamation activities would be greater than those under Alternative 1.	Similar to Alternative 4.

TABLE S.4-3 (Cont.)

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Land Use	Potential impacts due to land use conflicts are expected to be small under Alternative 1; the lands would continue to be closed to mineral entry, and all other activities, like recreation within the lease tracts, would continue.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Potential impacts due to land use conflicts are expected to be minor under Alternative 3; the lands would be closed to mineral entry, and all other activities, like recreation within the lease tracts, would continue.	Potential impacts due to land use conflicts are expected to be small under Alternative 4; the lands would continue to be closed to mineral entry, and all other activities, like recreation within the lease tracts, would continue.	Similar to Alternative 4.
Waste Management	Amounts of waste or trash generated would be small and would be taken to a mill for recovery, or taken to a permitted landfill near Nucla or Naturita.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Amounts of waste that would be generated during exploration, mine development and operations, and reclamation would be small and managed in a manner similar to that described for Alternative 1. Any waste-rock piles that would remain at the mine surface would be graded to be consistent with the surrounding area, provided with a top cover of soil or other material from the mine site, and seeded.	Amounts of waste or trash generated during the three phases would be small but more than those generated under Alternative 3. They would be managed in a manner similar to that described for Alternatives 1 and 3.	Similar to Alternative 4.

1 **TABLE S.4-4 Comparison of the Potential Impacts on Human Health from Alternatives 1 through 5**

Phase of Activities	Receptor	Assessment Endpoint ^a	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Mine development and operations	Uranium miner	Individual rad dose (mrem/yr)	NA ^b	NA	433 ^c	Same as Alt. 3	Same as Alt. 3
		Individual LCF risk (1/yr)	NA	NA	4×10^{-4} ^c	Same as Alt. 3	Same as Alt. 3
		Chemical risk (hazard index or HI)	NA	NA	1.1 ^d	Same as Alt. 3	Same as Alt. 3
	General public – resident	Individual rad dose (mrem/yr)	NA	NA	16–1.9 ^e (WL: 0.0013 to 0.00016)	Same as Alt. 3	Same as Alt. 3
		Individual LCF risk (1/yr)	NA	NA	2×10^{-5} to 3×10^{-6} ^e	Same as Alt. 3	Same as Alt. 3
		Collective rad dose (person-rem/yr)	NA	NA	7.5 to 39 ^f	17–94 ^f	20–110 ^f
		Collective LCF (1/yr)	NA	NA	0.01 to 0.05 ^f	0.02–0.1 ^f	0.03–0.1 ^f
		Chemical risk (HI)	NA	NA	$\ll 1.0$ ^e	Same as Alt. 3	Same as Alt. 3
Reclamation	Reclamation worker	Individual rad dose (mrem/yr)	14.3 (WL: $<2 \times 10^{-4}$)	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Individual LCF risk (1/yr)	1×10^{-5}	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Chemical risk (HI)	0.13	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
	General public – resident	Individual rad dose (mrem/yr)	8.9–0.08 ^g (WL: $<5 \times 10^{-4}$)	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Individual LCF risk (1/yr)	9×10^{-6} to 8×10^{-8} ^g	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Chemical risk (HI)	< 0.03	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1

TABLE S.4-4 (Cont.)

Phase of Activities	Receptor	Assessment Endpoint ^a	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Post-reclamation	General public – recreationist	Individual rad dose (mrem/yr)	0.88 to 30 ^h (WL: <2 × 10 ⁻⁴)	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Individual LCF risk (1/yr)	1 × 10 ⁻⁶ to 2 × 10 ⁻⁵	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Chemical risk (HI)	< 0.39	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
	General public – individual entering an inactive underground mine	Individual rad dose (mrem/h)	6.9 to 89 ⁱ (WL: 3 to 39)	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Individual LCF risk (1/h)	9 × 10 ⁻⁶ to 1 × 10 ⁻⁴ⁱ	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1
		Chemical risk (HI)	0	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1

- ^a Radiation dose and chemical risk (HI) estimates are rounded to two significant figures; latent cancer fatality (LCF) risk is rounded to one significant figure. For some radiation doses, the corresponding radon levels in terms of working level (WL) are also listed in parentheses. The estimates listed are based on a Ra-226 concentration of 70 pCi/g in waste-rock piles.
- ^b NA = not applicable; continued uranium mining would not occur under Alternatives 1 and 2.
- ^c The listed values are based on historical data on the average exposures of underground uranium miners.
- ^d The impact associated with exposure to particulates containing uranium and vanadium compounds during this phase was estimated based on the radiation dose associated with inhalation of particulates containing uranium isotopes and their decay products.
- ^e Potential individual radiation dose and LCF risk for the general public – resident scenario would depend on the location of the residence. The dose and risk are functions of the distance and direction from the residence to the radon emission source. The listed range is associated with a residence located in the dominant wind direction that gives the highest exposures at a distance of 1,630 to 16,400 ft (500 to 5,000 m) to the emission source, which is a medium-underground mine. Potential dose and LCF risk associated with a small underground mine would be about half of the listed values; those associated with a large underground mine would be about twice the listed values. Potential dose and LCF risk associated with a very large open-pit mine would be greater than those associated with a small underground mine but less than those associated with a medium-sized underground mine for a distance of 3,300 ft (1,000 m) or greater. Potential hazard index associated with the exposures of residents is expected to be much smaller than that associated with the exposures of uranium miners (i.e., much smaller than the threshold value of 1).

Footnotes continued on next page.

TABLE S.4-4 (Cont.)

-
- f The collective dose and LCF risk were estimated for the entire population living at a distance of 3.1 to 50 mi (5 to 80 km) from the center of each lease tract group. The collective dose and LCF risk correspond to the peak year of operations. In any other year, the collective dose/LCF risk is expected to be lower than the listed value.
- g Potential individual radiation dose and LCF risk for the general public – resident scenario would depend on the location of the residence. The dose and risk are functions of the distance and direction from the residence to the source of radon and particulate emissions. The listed range is associated with a residence located in the most dominant wind direction at a distance of 1,600 to 16,000 ft (500 to 5,000 m) to the emission source, which is a waste-rock pile at a scale ranging from small to very large. The waste-rock pile is assumed to be generated by the development and operations of an underground mine for 10 years.
- h The recreationist dose and LCF risk results were obtained based on the assumption that the emission source (i.e., a waste-rock pile) would be covered by 0–1 ft (0–0.3 m) of soil materials.
- i Potential individual radiation dose and LCF risk for the general public – individual entering an inactive underground mine were calculated on the basis of radon levels that were measured in three abandoned mines in the United Kingdom (Denman et al. 2003).

1 **TABLE S.4-5 Comparison of the Potential Impacts on Ecological Resources from Alternatives 1 through 5**

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Vegetation	<p>It is expected that impacts under Alternative 1 would generally be minor and short term. Areas affected by Alternative 1 activities would generally consist of previously disturbed areas, and reclamation would generally include relatively small surface areas (approximately 1 to 8 acres [0.4 to 3.2 ha] per mine, other than the JD-7 mine). Reclamation would establish plant communities on disturbed areas, including waste rock; however, resulting plant communities might be considerably different from those of adjacent areas. The successful reestablishment of some plant communities, such as sagebrush shrubland or piñon-juniper woodland, would likely require decades.</p> <p>Indirect impacts associated with reclamation activities could include the deposition of fugitive dust, erosion, sedimentation, and the introduction of non-native species, including noxious weeds. However, because of the small areas involved and short duration of reclamation activities, these would generally constitute a short-term impact. The establishment of invasive species, including the potential alteration of fire regimes, could result in long-term impacts, although monitoring and vegetation management programs would likely control invasive species.</p>	<p>Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.</p>	<p>Impacts under Alternative 3 would range from minor to moderate and short term to long term. Impacts from exploration would result from disturbance of vegetation and soils, the removal of trees or shrubs, compaction of soils, destruction of plants, burial of vegetation under waste material, or erosion and sedimentation. Exploration activities are expected to affect relatively small areas, and impacts would generally be short term. The localized destruction of biological soil crusts, where present, would be considered a longer-term impact, particularly where soil erosion has occurred.</p> <p>Ground disturbance from mine development and operations would range from 10 to 20 acres (4 to 8 ha) per mine, except for the 210-acre (85-ha) JD-7 open-pit mine. Impacts would include the destruction of habitats during site clearing and excavation, as well as the loss of habitat in additional use areas. Affected areas might include high-quality mature habitats or previously degraded areas. Wetlands present on project sites could be directly or indirectly affected. Indirect impacts from mining would be associated with fugitive dust, invasive species, erosion, sedimentation, and impacts due to changes in surface water or groundwater hydrology or water quality. The deposition of fugitive dust and the establishment of invasive species, including the potential alteration of fire regimes, could result in long-term impacts.</p>	<p>Impacts would be similar to those for Alternative 3, except a larger area (460 acres, or 190 ha) would be disturbed.</p>	<p>Similar to Alternative 4 with respect to the amount of area disturbed, but disturbance would be for a shorter period of time (i.e., 10 years versus potentially more than 10 years for Alternative 4).</p>

TABLE S.4-5 (Cont.)

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wildlife	Reclamation activities would cause a short-term, localized disturbance of wildlife in the area of the 13 mine sites on 10 lease tracts. Reclamation of 267 acres (108 ha) would result in long-term, localized improvement of wildlife habitats within the 10 lease tracts. Negligible impacts on wildlife would occur during DOE's long-term management of the withdrawn lands.	Similar to Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	There could be impacts on a total of 310 acres (125 ha) of wildlife habitat at 8 mine sites within 1 or more of the 12 formerly active lease tracts during the peak year of operations. Additional habitats could be affected by any access roads or utility lines required for the mines. Impacts on wildlife could occur from habitat disturbance, wildlife disturbance, and wildlife injury or mortality and habitat loss. Overall, localized impacts on wildlife would range from negligible to moderate during mine development and operations, while wildlife impacts would be long term (last for decades), would be scattered temporarily and, especially, spatially, and would not affect the viability of wildlife populations.	Impacts would be similar to those from Alternative 3, except that a total of 460 acres (190 ha) of wildlife habitat at 19 mine sites could be disturbed within any of the 31 lease tracts during the peak year of operations. Overall, localized impacts on wildlife would range from negligible to moderate and would not affect the viability of wildlife populations.	Impacts on a total of 490 acres (198 ha) of wildlife habitat at 19 mine sites within any of the 31 lease tracts during the peak year of operations. Impacts on wildlife would be similar to, but for a shorter time period than, those for Alternative 4. Overall, localized impacts on wildlife would range from negligible to moderate and would not affect the viability of wildlife populations.
Aquatic Biota	Reclamation activities could cause sediment deposition in intermittent and ephemeral streams and possibly the Dolores River. The potential for sediments to enter the perennial streams is negligible to minor due to the limited amount of land undergoing reclamation in any given area. Reclaimed areas would be less prone to erosion as vegetation becomes established.	Similar to Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Impacts on aquatic resources could result from increases in sedimentation and turbidity from soil erosion and runoff during mine development and operations. There would be a very low likelihood of an accidental ore spill into a perennial stream or river. Overall, localized impacts on aquatic biota would range from negligible to moderate and would not affect the viability of any aquatic species.	Impacts on aquatic resources would be similar to those under Alternative 3, except that 19 mines could be in operation on any of the 31 lease tracts during the peak year of operations. Overall, localized impacts on aquatic biota would range from negligible to moderate and would not affect the viability of any aquatic species.	Impacts on aquatic resources would be similar to those under Alternative 4, except that the mines would be in operation for a shorter length of time. Overall, localized impacts on aquatic biota would range from negligible to moderate and would not affect the viability of any aquatic species.

TABLE S.4-5 (Cont.)

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Threatened, Endangered, and Sensitive Species	Reclamation activities would generally cause minor, short-term impacts on threatened, endangered, and sensitive species. The small scale of reclamation activities on previously disturbed areas would generally have minor direct impacts on sensitive terrestrial species. Indirect impacts associated with water withdrawal, erosion, and sedimentation might have minor, short-term impacts on sensitive aquatic species (including Colorado River endangered fish species).	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	<p>Potential impacts on threatened, endangered, and sensitive species could range from small to moderate and short term to long term, depending on the location of the mines and amount of surface disturbance. Direct impacts could result from the destruction of habitats during site clearing, excavation, and operations. Indirect impacts could result from fugitive dust, erosion, sedimentation, and impacts related to altered surface water and groundwater hydrology. The USFWS concluded that implementation of the best management practices related to aquatic habitats and water quality will reduce water quality impacts to the extent that they are insignificant.</p> <p>Water withdrawals from the Upper Colorado River Basin to support mining activities may result in potentially unavoidable impacts on aquatic biota (particularly the Colorado River endangered fish species). For this reason, DOE determined in its May 2013 BA that ULP activities under Alternative 3 may affect, and are likely to adversely affect, the Colorado River endangered fish species and their critical habitat. The USFWS then concluded, in its August 2013 BO, that water depletions under Alternative 3 were not likely to jeopardize the continued existence of the Colorado River endangered fish species and not likely to destroy or adversely modify designated critical habitat; that a water depletion fee did not apply (under a 2010 BO that addressed small water depletions); and that further programmatic consultation is not required (Appendix E of the ULP PEIS).</p>	Similar to Alternative 3. However, there would be more lease tracts available for mining under this alternative, thereby increasing the area that could be disturbed or developed and the potential for impacts on threatened, endangered, and sensitive species.	Similar to Alternative 4, but the total disturbed surface area is somewhat larger than that under Alternative 4.

1
2

TABLE S.4-6 Comparison of the Potential Impacts on Socioeconomics, Environmental Justice, and Transportation from Alternatives 1 through 5

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Socioeconomics	Potential impact is expected to be minor. Reclamation activities would require 29 direct jobs and generate 16 indirect jobs. Reclamation would produce \$1.7 million in income. There would likely be a small positive impact on recreation and tourism because of the reclamation that would be completed.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Potential impact is expected to be minor. Mine development and operations would create 123 direct jobs, 98 indirect jobs, \$4.7 million in direct income, and \$4.0 million in indirect income. In-migration could include up to 63 people moving into the ROI. Reclamation activities would require 29 direct jobs and generate 17 indirect jobs. Reclamation would produce \$1.8 million in income.	Potential impact is expected to be minor. Mine development and operations would create 229 direct jobs, 152 indirect jobs, and \$14.8 million in income. In-migration could include up to 115 people moving into the ROI. Reclamation activities would require 39 direct jobs and generate 21 indirect jobs. Reclamation would produce \$2.4 million in income.	Potential impact is expected to be minor. Mine development and operations would create 253 direct jobs, 152 indirect jobs, and \$15.6 million in income. In-migration could include up to 122 people moving into the ROI. Reclamation activities would require 39 direct jobs and generate 25 indirect jobs. Reclamation would produce \$2.5 million in income.
Environmental Justice	Potential impacts on the general population could result from uranium mining activities. For the resources evaluated, impacts would be likely to be minor and would be unlikely to disproportionately affect low-income and minority populations.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Potential impacts are likely to be minor and are unlikely to disproportionately affect low-income and minority populations. Specific impacts on low-income and minority populations as a result of participation in subsistence or cultural and religious activities would also be minor and unlikely to be disproportionate.	The types of impacts related to mine development and operations under Alternative 4 would be similar to those described under Alternative 3, but the increase in the disturbed area under Alternative 4 could potentially increase the impacts; however, no disproportionately high and adverse impacts on low-income or minority populations would occur. Impacts on low-income and minority populations associated with the reclamation activities would be the same as those under Alternative 1.	The types of impacts related to exploration under Alternative 5 would be similar to those under Alternative 3. The types of impacts related to mine development and operations under Alternative 5 would be similar to those under Alternative 4. Under Alternative 5, for the majority of resources evaluated, the impacts would likely be minor and would be unlikely to have disproportionate impacts on low-income or minority populations.

TABLE S.4-6 (Cont.)

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Transportation	No transportation of uranium ore would occur. There would be no radiological transportation impacts. No changes in current traffic trends near the DOE ULP lease tracts would be anticipated because no significant supporting truck traffic or equipment moves would occur, and only about five reclamation workers would be commuting to each site on a regular basis during reclamation activities.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	There would be an average of approximately 40 round-trip uranium ore truck shipments per weekday under Alternative 3. For the sample case considered, the total annual distance travelled in the peak year by the haul trucks would be about 1.10 million mi (1.77 million km), primarily on CO 90 and CO 141 and on US 491 and US 191. The estimated attendant traffic accident injuries and fatalities would be about 0.33 and 0.029, respectively. The resultant collective radiological population dose to those individuals living and working near the haul routes was estimated to be approximately 0.14 person-rem, a dose that could potentially result in an LCF risk of 8×10^{-5} . The potential annual collective dose estimated for the truck drivers is 0.71 person-rem, with an associated LCF risk of 0.0004. Dependent on which lease tracts have mining operations and which mill was used in each case, the total annual distance in the peak year could range from about 0.47 million to 2.22 million mi (751,000 to 3.58 million km), with impacts roughly proportional to the distance travelled.	There would be an average of approximately 80 round-trip uranium ore truck shipments per weekday under Alternative 4. For the sample case considered, the total annual distance travelled in the peak year by the haul trucks would be about 2.22 million mi (3.57 million km), primarily on CO 90 and CO 141 and on US 491 and US 191. The estimated attendant traffic accident injuries and fatalities would be about 0.63 and 0.057, respectively. The resultant collective radiological population dose to those individuals living and working near the haul routes was estimated to be approximately 0.28 person-rem, a dose that could potentially result in an LCF risk of 0.0002 in the population. The potential annual collective dose estimated for the truck drivers is 1.4 person-rem, with an associated LCF risk of 0.0009. Dependent on which lease tracts have mining operations and which mill was used in each case, the total annual distance in the peak year could range from about 1.14 million to 4.26 million mi (1.84 million to 6.86 million km), with impacts roughly proportional to the distance travelled.	There would be an average of approximately 92 round-trip uranium ore truck shipments per weekday under Alternative 5. For the sample case considered, the total annual distance travelled in the peak year by the haul trucks would be about 2.72 million mi (4.38 million km), primarily on CO 90 and CO 141 and on US 491 and US 191. The estimated attendant traffic accident injuries and fatalities would be about 0.81 and 0.073, respectively. The resultant collective radiological population dose to those individuals living and working near the haul routes is estimated to be approximately 0.34 person-rem, a dose that could potentially result in an LCF risk of 0.0002 in the population. The potential annual collective dose estimated for the truck drivers was 1.8 person-rem, with an associated LCF risk of 0.001. Depending on which lease tracts have mining operations and which mill was used in each case, the total annual distance in the peak year could range from about 1.45 million to 4.90 million mi (2.34 million to 7.88 million km), with impacts roughly proportional to the distance travelled.

TABLE S.4-7 Comparison of the Potential Impacts on Cultural Resources and Visual Resources from Alternatives 1 through 5

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Cultural Resources	Under Alternative 1, indirect impacts could occur on all known cultural resources located within the 10 lease tracts. It is estimated that there are 111 resources within the 10 lease tracts. Direct impacts are not expected because areas to be reclaimed have already been disturbed, and no new land disturbance is expected. Indirect impacts under Alternative 1 would include the increased potential for vandalism related to road or footpath expansion and for the disturbance of a cultural resource from fugitive dust. Significant cultural properties that could be adversely affected by the proposed action would be identified before any ground-disturbing activities occurred, and plans would be modified to avoid or mitigate impacts on cultural resources. There is potential for buried cultural deposits to be uncovered even if sites were not identified on the surface prior to ground disturbance activities.	Same as Alternative 1. However, under BLM's multiple use policies, there could be additional potential impacts.	Under Alternative 3, indirect impacts could occur on all known cultural resource sites located within the 12 lease tracts. It is estimated that there are 128 resources within the 12 lease tracts. Direct impacts could occur on eight of these resources. Potential direct impacts would include the disturbance of buried cultural resources or surface deposits as a result of excavation, vibration from equipment, and fugitive dust. Indirect impacts would include visual disturbance to resources; the introduction of noise to traditional sacred areas; and an increased potential for vandalism, erosion, trampling, and nonauthorized collecting related to road or footpath expansion. Significant cultural properties that would be adversely affected by the proposed actions would be identified before any ground-disturbing activities occurred, and plans would be modified to avoid or mitigate impacts on cultural resources.	Under Alternative 4, indirect impacts on all known cultural resources located within the 31 lease tracts could occur. Direct impacts could occur on 21 of these resources. Types of potential impacts would be the same as those discussed for Alternative 3. Significant cultural properties that would be adversely affected by the proposed action would be identified before ground-disturbing activities occurred, and plans could be modified to avoid or mitigate impacts on cultural resources.	Similar to Alternative 4, except that direct impacts could occur on 23 of the known cultural resources on the 31 lease tracts.

TABLE S.4-7 (Cont.)

Resource/ System	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Visual Resources ^a	<p>Potential visual impacts that could occur under Alternative 1 would include vegetation clearing, landform alteration, removal of structures and materials, changes to existing roadways, vehicular and worker activity, and light pollution.</p> <p>Under Alternative 1, one or more of the 10 lease tracts would be visible from portions of the Sewemup WSA, Palisade ONA ACEC, Palisade WSA, UnawEEP/Tabeguache Scenic and Historic Byway, Tabeguache Area, Dolores River Canyon WSA, Dolores River SRMA, McKenna Peak WSA, San Miguel ACEC, San Miguel SMRA, and Trail of the Ancient Byways, which are located within 0–25 mi (0–40 km) of the lease tracts. Visual contrast of visible activities occurring within the lease tracts would range from none to strong, depending on the viewer’s location with respect to the SVRA.</p>	<p>Similar to Alternative 1. However, under BLM’s multiple use policies, there could be additional potential impacts.</p>	<p>Potential visual impacts that could occur under Alternative 3 include vegetation clearing, exploratory drilling, road construction, support facility construction, worker and equipment presence, and lighting in the form of skyglow, light trespass, or glare.</p> <p>Under Alternative 3, one or more of the 12 lease tracts would be visible from portions of the Sewemup WSA, UnawEEP/Tabeguache Scenic and Historic Byway, Tabeguache Area, Dolores River Canyon WSA, Dolores River SRMA, McKenna Peak WSA, San Miguel ACEC, San Miguel SMRA, and Trail of the Ancient Byways, which are located within 0–25 mi (0–40 km) of the lease tracts. Visual contrast of visible activities occurring within the lease tracts would range from none to strong, depending on the viewer’s location with respect to the SVRA.</p>	<p>Potential visual impacts under Alternative 4 would be the same as those under Alternative 3.</p> <p>Under Alternative 4, 1 or more of the 31 lease tracts would be visible from portions of the Sewemup, Palisade, Squaw/Papoose Canyon, McKenna Peak, Dolores River Canyon, and Cahone Canyon WSAs; the Palisade ONA, San Miguel SMRA, and San Miguel ACECs; the UnawEEP/Tabeguache Scenic and Historic Byway; the Tabeguache Area; the Dolores River SRMA; Canyon of the Ancients National Monument; and Trail of the Ancient Byways, which are located within 0–25 mi (0–40 km) of the lease tracts. Visual contrast of visible activities occurring within the 31 lease tracts would range from none to strong, depending on the viewer’s location with respect to the SVRA.</p>	<p>Similar to Alternative 4.</p>

^a ONA = Outstanding Natural Area, SRMA = Special Recreation Management Area, SVRA = special visual resource area, WA = Wilderness Area, WSA = Wilderness Study Area.

S.5 MEASURES TO MINIMIZE POTENTIAL IMPACTS FROM ULP MINING ACTIVITIES

The potential impacts discussed in Tables S.4-2 through S.4-7 are expected to be minimized or reduced by implementing the measures listed in Table S.5-1. These measures apply to the three phases of the proposed action (exploration, mine development and operations, and reclamation), as applicable. The measures have been grouped by the 12 objectives included in Table S.5-1 and further categorized into the following three categories:

1. *Compliance measures*: Measures that are required by applicable regulations.
2. *Mitigation measures*: Measures that are required by DOE as identified in current leases or that could be added to the leases when modified. DOE may also identify additional mitigation measures.
3. *Best management practices (BMPs)*: Best industry practices and activities that should be considered during implementation, as practicable.

Reclamation activities would be conducted to ensure that post-reclamation mine conditions are protective of the environment and human health. Mitigation measures such as those listed in Table S.5-1 would be implemented so that potential exposure to a reasonable end-state scenario (i.e., a recreational visitor scenario at the mine site footprint and within the lease tracts, and a resident scenario for outside the lease tracts) would be at acceptable risk levels (e.g., meet applicable dose requirements or the EPA's acceptable risk range) for the appropriate end-state land use.

Specifics associated with the measures (compliance, mitigation measures, or BMPs) that involve monitoring, sample collection, and the installation of protective elements (e.g., depth of soil cover on waste-rock piles, the necessity for and/or type of liners for water evaporation ponds, other elements) during operations and reclamation would be identified in the mine plans submitted to DOE for review and approval.

1 **TABLE S.5-1 Measures Identified To Minimize Potential Impacts from Uranium Mining at the ULP Lease Tracts**

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
M-1 Reduce dust emissions; reduce air emissions			
• Apply water or chemical suppressants on unpaved haul roads, disturbed surfaces, and temporary stockpiles.	X		
• Limit soil-disturbing activities and travel on unpaved roads.		X ^d	
• Design and construct new access roads to meet appropriate standards; roads should be no larger than necessary to accommodate their intended function.		X ^d	
• Cover unpaved access roads, frequently used on-site roads, and parking lots with aggregate.	X		
• Assure all heavy equipment meets emission standards as required.	X		
• Limit idle time of vehicles and motorized equipment.			X
• Fuel all diesel engines used with ultra-low sulfur diesel (sulfur content of ≤15 parts per million [ppm]).			X ^e
• Avoid construction traffic and reduce speeds on unpaved surfaces.	X		
• Ensure that all vehicles transporting loose materials are covered (e.g., with tarpaulins), both when travelling with a load of ore and when returning empty; loads should be sufficiently wet and kept below the freeboard.	X		
M-2 Identify and protect paleontological resources			
• Consult with affected BLM Field Offices to determine whether areas of moderate to high fossil-yield potential (i.e., PFYC 3, 4, or 5) or known significant localities occur within proposed areas of disturbance and if surveys, sampling, or the development of paleontological resources management plan would be needed.			X
• Immediately notify the BLM authorized officer of any paleontological resources discovered as a result of mining activities so that appropriate measures to mitigate adverse effects to significant paleontological resources can be determined and implemented. Operations may continue if activities can avoid further impacts on the fossil discovery or can be continued elsewhere.			X

2

TABLE S.5-1 (Cont.)

Measure Description		Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
M-3	Reduce noise-related impacts			
	<ul style="list-style-type: none"> Maintain noise level below Colorado maximum permissible limit of 55 dBA during the day (7 a.m.–7 p.m.) and of 50 dBA at night (7 p.m.–7 a.m.), and below EPA guideline level of 55 dBA L_{dn} at receptor location. Maintain equipment in good working order in accordance with manufacturer's specifications. Limit noisy activities to the least noise-sensitive times of the day (daytime between 7 a.m. and 7 p.m.) and weekdays and limit idle time for vehicles and motorized equipment. Notify area residents of high-noise and/or high-vibration-generating activities (e.g., aboveground and belowground blasting) in advance. Employ noise-reduction devices (e.g., mufflers) as appropriate. Provide a noise complaint process for surrounding communities. Site noise sources to take advantage of topography and distance; construct engineered sound barriers and/or berms as necessary. Limit operational noise to 49 dBA or less within 2 mi (3 km) from an occupied/active Gunnison sage-grouse lek. 	X		X X X X X X
M-4	Protect soils from erosion; protect local surface water bodies from contamination and sedimentation; protect local aquifers from contamination			
	<ul style="list-style-type: none"> Identify local factors that cause slope instability (e.g., slope angles, precipitation) and avoid areas with unstable slopes. Avoid creating excessive slopes during excavation; use special construction techniques, where applicable, in areas of steep slopes, erodible soil, and stream channel crossings. Apply all dust palliatives in accordance with appropriate laws and regulations; ensure that dust suppression chemicals are not sprayed on (released to) soils or streams. Control and direct runoff from slope tops to settling or rapid infiltration basins until disturbed slopes are stabilized; stabilize slopes as quickly as possible. Assure operators comply with CDRMS requirements regarding groundwater and groundwater contamination. Obtain borrow materials from authorized or permitted sites. Retain sediment-laden waters from disturbed areas with the lease tract through the use of barriers and sedimentation devices (e.g., berms, straw bales, sandbags, jute netting, or silt fences) as necessary. Place barriers and sedimentation devices around drainages and wetlands. 	X ^h X X ^h	X ^f X ^g X ⁱ	X X ^g X ^g

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> • Require developers using on-site groundwater supplies to conduct a hydrologic study consistent with that required by the state’s environmental protection plan. 	X		
<ul style="list-style-type: none"> • Conduct routine inspections to assess effectiveness and maintenance requirements for erosion and sediment control systems. 			X
<ul style="list-style-type: none"> • Maintain, repair, or replace barriers and sedimentation devices as necessary to ensure optimum control. 	X ^h		
<ul style="list-style-type: none"> • Inspect and clean tires of all vehicles to ensure they are free of dirt before they enter paved public roadways to the extent practicable. 			X
<ul style="list-style-type: none"> • Locate a diversion ditch upstream of the mine site to intercept surface water flow or shallow groundwater and channel it around the site; tailor the location and length of the ditch to site-specific conditions, taking into account the location of mine waste piles, the site topography, and surface flow patterns. 	X ^h		
<ul style="list-style-type: none"> • Place drill holes at a distance from existing water rights to the extent possible. 			X
<ul style="list-style-type: none"> • Plug open drill holes and areas around vent shafts to reduce the volume of groundwater entering an underground mine during operations to the extent possible; use underground sumps to contain water flow, as needed; pump water from groundwater seepage to control water flow, if necessary, into surface mine-water treatment pond. 		X ^j	
<ul style="list-style-type: none"> • Divert water pumped from mines (or drill sites) to a lined sedimentation pond for treatment. Locate settling pond(s) in topographically low areas (but not any that are along drainages or near naturally flowing water). The purpose of treatment is to promote the precipitation of heavy metals through oxidation processes like aeration. (Employ this option at sites at which the mine drainage is high in total suspended solids). 	X ^h		
<ul style="list-style-type: none"> • As sedimentation ponds are cleaned, test sediments and precipitates for proper disposal. 	X ^h		
<ul style="list-style-type: none"> • Locate mine ore storage and waste-rock or tailings piles on topographically high ground so they do not come into direct contact with flowing or ponded water; grade the ore storage area and construct an earthen berm around it. Divert any runoff from the area to a sedimentation pond for testing and treatment. 		X	
<ul style="list-style-type: none"> • Contain any runoff from mine waste-rock piles (e.g., divert it to a sedimentation pond) and treat it, as needed. 	X ^h		
<ul style="list-style-type: none"> • Provide off-site (downgradient) groundwater monitoring consistent with Colorado requirements for groundwater protection permits. New mining activities should consider cumulative impacts in combination with other projects also occurring in the vicinity with implementation of necessary measures for the protection of human health and the environment. 	X ⁱ		
<ul style="list-style-type: none"> • Site and design mine entrances and activities so that they avoid direct and indirect impacts on important, sensitive, or unique habitats, including, but not limited to, wetlands (both jurisdictional and nonjurisdictional), springs, seeps, streams (ephemeral, intermittent, and perennial), 100-year floodplains, ponds and other aquatic habitats, riparian habitats, remnant vegetation associations, rare or unique biological communities, crucial wildlife habitats, and habitats supporting sensitive species populations. 		X ^k	

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> Restrict activities at previously mined sites so they do not further encroach toward perennial streams (e.g., the Dolores River); new mining activities should not be allowed within 0.25 mi (0.40 km) of perennial streams and should consider cumulative impacts in combination with other projects also occurring in the vicinity with implementation of necessary measures for the protection of human health and the environment; avoid the placement of facilities or roads in drainages; and make necessary accommodations for the disruption of runoff. 		X ^l	
<ul style="list-style-type: none"> Identify surface water runoff patterns at the mine site and develop mitigation that prevents soil deposition and erosion throughout and downhill from the site; potential adverse impacts could be minimized by incorporating erosion-control techniques such as water bars, weed-free hay bales and silt fences, vegetation, erosion-control fabric, temporary detention basins, and land contours in the construction design. 	X ^h		
<ul style="list-style-type: none"> Assure that herbicides used meet the specifications and standards of BLM and county weed control staff. 	X ^m		
<ul style="list-style-type: none"> Seed soil stockpiles to minimize erosion and growth of weeds. 			X
<ul style="list-style-type: none"> Apply methods such as chisel plowingⁿ or subsoiling^o (tilling), as necessary, to abandoned roads and areas no longer needed to alleviate soil compaction. 			X
<ul style="list-style-type: none"> Limit herbicide use to nonpersistent, immobile substances. Do not use herbicides near or in U.S. waters, including ponds, lakes, streams (intermittent or perennial), and wetlands, unless the herbicide is labeled for such uses. If herbicides are used in or near U.S. waters, the applicator shall ensure that the applications meet the requirements of the EPA’s “Pesticide General Permit for Discharges from the Application of Pesticides.” Determine setback distances in coordination with Federal and state resource management agencies. Before beginning any herbicide treatments, ensure that a qualified biologist has conducted surveys of bird nests and of sensitive species to identify the special measures or BMPs that are necessary to avoid and minimize impacts on migratory birds and sensitive species. The herbicides to be used would be approved by BLM through submission of “Pesticide Use Proposal” forms. The state-, county-, and BLM-listed plant species scheduled for eradication that are found in the project area would be eradicated and reported to BLM through submission of “Pesticide Application Records.” 	X ^m		
M-5 Minimize the extent of ground disturbance and the duration of ground-disturbing activities			
<ul style="list-style-type: none"> Reduce the surface footprint of disturbed areas (buildings, service areas, storage areas, stockpile areas, and loading areas) within the lease tracts to the extent possible. 			X
<ul style="list-style-type: none"> Minimize the duration of ground-disturbing activities, especially during periods of heavy rainfall. 			X
<ul style="list-style-type: none"> Expand disturbed areas (e.g., waste-rock pile storage areas) incrementally to the extent practicable. 			X
<ul style="list-style-type: none"> Use existing roads and disturbed areas (and transportation right-of-ways [ROWs]) to the extent possible (before constructing new roads or disturbing new areas). 		X	

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> If ground-disturbing activities require an extended schedule, employ measures to limit exposure to wind and water during the activity. 			X
<ul style="list-style-type: none"> Avoid clearing and disturbing sensitive areas (e.g., steep slopes and natural drainages) and minimize the potential for erosion. 		X	
<ul style="list-style-type: none"> Limit access to disturbed areas and staging areas to authorized vehicles traveling only on designated (dust-stabilized) roads. 			X
<ul style="list-style-type: none"> Minimize disturbance to vegetation, soils, drainage channels, and stream banks. 		X ^p	
M-6 Restore original grade and reclaim soil and vegetation			
<ul style="list-style-type: none"> Salvage topsoil and vegetation prior to site disturbance and place in stockpiles (to be used in final reclamation). 			X
<ul style="list-style-type: none"> Use DOE-developed seed mixture. 	X ^m		
<ul style="list-style-type: none"> Reestablish the original grade and drainage pattern of all disturbed areas before final reclamation to the extent practicable. 		X ^p	
<ul style="list-style-type: none"> Test for agronomic nutrient profile to determine whether amendments are needed to establish vegetation before final reclamation. 			X
<ul style="list-style-type: none"> Place topsoil over the top of disturbed areas and seed (e.g., by broadcast or drill seeder). 		X	
<ul style="list-style-type: none"> Monitor seeded areas for some period following seeding to ensure vegetation is reestablished. 	X ^h		
<ul style="list-style-type: none"> Grade mine waste-rock or tailings piles to create a gently sloping (more stable) surface. 		X ^f	
<ul style="list-style-type: none"> Recontour soil borrow areas and cut and fill slopes, berms, waterbars, and other disturbed areas to approximate naturally occurring slopes. 		X ^f	
M-7 Protect wildlife and wildlife habitats (and grazing animals, if present) from ground disturbance and general site activities			
<ul style="list-style-type: none"> Use wattles or other appropriate materials to reduce potential for sediment transport off the site. 			X
<ul style="list-style-type: none"> Avoid unnecessary disturbance or feeding of wildlife. The collection, harassment, or disturbance of wildlife and their habitats should be reduced through employee and contractor education about applicable state and Federal laws. 			X

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> Minimize the number of areas where wildlife could hide or be trapped (e.g., open sheds, pits, uncovered basins, and laydown areas). For example, cap uncovered pipes at the end of each workday to prevent animals from entering the pipes. If a sensitive species is discovered inside a component, do not move that component, or, if it must be moved, move it only to remove the animal from the path of activity, until the animal has escaped. 			X
<ul style="list-style-type: none"> Establish buffer zones around sensitive habitats and either exclude project facilities and activities from those areas or modify them within those areas, to the extent practicable. 			X
<ul style="list-style-type: none"> If any Federally listed threatened and endangered species are found during any phase of the project, consult with the USFWS as required by Section 7 of the ESA and determine an appropriate course of action to avoid or mitigate impacts. 	X		
<ul style="list-style-type: none"> Schedule activities to avoid critical winter ranges for big game (mule deer and elk) when they are heavily used (December 1 through April 15), or utilize compensatory mitigation (e.g., habitat enhancement or replacement) to offset long-term displacement of big game from critical winter ranges. Compensatory mitigation projects may be developed in coordination with CPW. 		X	
<ul style="list-style-type: none"> Conduct pre-disturbance surveys for threatened, endangered, and sensitive species within all areas that would be disturbed by mining activities. These surveys would be used to determine the presence of sensitive species on the lease tracts and develop the appropriate measures to avoid, minimize, or mitigate impacts on these species. If sensitive species are located in the area that might be developed, coordination with the USFWS and CPW would be necessary to determine the appropriate species-specific measures. 		X	
<ul style="list-style-type: none"> Minimize increases in the number of nuisance animals and pests in the project area, particularly any individuals or species that could affect human health and safety or that could adversely affect native plants and animals to the extent practicable. 			X
<ul style="list-style-type: none"> Monitor to the extent practicable the potential for an increase in the predation of sensitive species (particularly Gunnison sage-grouse) from ravens and other species that are attracted to developed areas and that use tall structures opportunistically to spot vulnerable prey. 			X
<ul style="list-style-type: none"> Locate soil borings, mine entrances, and travel routes to avoid important, sensitive, or unique habitats, including, but not limited to, wetlands, springs, seeps, ephemeral streams, intermittent streams, ponds and other aquatic habitats, riparian habitat, remnant vegetation associations, rare natural communities, and habitats supporting sensitive species populations as identified in applicable land use plans or best available information and science. 		X ^g	
<ul style="list-style-type: none"> Conduct pre-construction raptor nest surveys to ensure compliance with the Migratory Bird Treaty Act; follow the recommended buffer zones and seasonal restrictions for Colorado's raptors (CPW 2008). 	X ^q		

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> • Schedule activities to avoid, minimize, or mitigate impacts on wildlife. For example, avoid crucial winter ranges, especially during the periods when they are used. If there are plans to conduct activities during bird breeding seasons, a nesting bird survey should be conducted first. If active nests are detected, the nest area should be flagged, and no activity should take place near the nest (at a distance determined in coordination with the USFWS) until nesting is completed (i.e., until nestlings have fledged or the nest has failed) or until appropriate agencies agree that construction can proceed with the incorporation of agreed-upon monitoring measures. Coordinate the timing of activities with BLM, USFWS, and CPW. Prior to authorization of ground disturbing activities a habitat suitability analysis would be done and for habitats found suitable, a protocol survey would be done. If nesting birds are found, seasonal and year-round buffers would be established with USFWS coordination. 		X	
<ul style="list-style-type: none"> • Avoid and minimize impacts to bats during mine renewal activities (as well as during mine closure and reclamation) as follows: <ul style="list-style-type: none"> – Reentry of existing mines that contain winter roosting bats should be avoided during the winter season (October 1 through April 15). For existing mines expected to be reused, exclusion devices could be used to prevent bats from using the mines during winter. This would involve screening out bats by placing chicken wire with ≤ 1-in. (2.5-cm) mesh across the bat gate or open-access point at mine complexes that are ungated. Exclusions should be installed by September 1, if possible, but no later than September 30. – Existing mines utilized as summer roosting sites (other than maternity roost sites) can be handled similarly. The summer season is considered April 15 through September 1. – Any mine to be reworked that is used as a maternity roost should undergo an exclusion effort by April 15 and should be maintained from at least April 15 through June 15. Also, the portal(s) should be covered during night to prevent the potential reuse as maternity sites. In the event that a maternity roost will be permanently impacted, consideration should be given to preserving nearby mine features, if possible, to serve as mitigation and as a possible alternate habitat for bats. This is also recommended to mitigate impacts for a large winter roost site that will be permanently impacted. The creation of artificial bat habitat could also serve as an important alternative to mitigate impacts on maternity roosts or large winter roost sites. – For mine sites used year round, mining renewal activities should be spring (April through May) or fall (September through October). – The development and enactment of bat mitigation should be coordinated with the Colorado Bat Working Group and CPW. 		X	

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> • Avoid vegetation clearing, grading, and other construction activities during the bird breeding season; if activities are planned during the breeding season, a survey of nesting birds should be conducted first. If active nests are detected, the nest area should be flagged, and no activity should take place near the nest (at a distance determined in coordination with the USFWS) until nesting is completed (i.e., until nestlings have fledged or the nest has failed) or until appropriate agencies agree that construction can proceed with the incorporation of agreed-upon monitoring measures. Coordinate the timing of initial development activities with the BLM, USFWS, and CPW. 	X ^q		
<ul style="list-style-type: none"> • Relocate wildlife found in harm's way away from the area of the activity when safe to do so. 			X
<ul style="list-style-type: none"> • Design stream crossings to provide in-stream conditions that would allow for and maintain uninterrupted movement of water and safe passage of fish; minimize removal of any deadfall and overhanging vegetation that provides shelter and shading to aquatic organisms. 			X
<ul style="list-style-type: none"> • Exclude new mining and other surface-disturbing activities within 0.25 mi (0.4 km) of the Dolores River to avoid impacts on a desert bighorn sheep movement corridor (and other wildlife). 		X ¹	
<ul style="list-style-type: none"> • Limit vegetation maintenance for transmission lines located near aquatic habitats or riparian areas (e.g., use minimum buffers identified in the applicable land use plan or best available science and information) and perform maintenance mechanically rather than with herbicides. Cutting in wetlands or stream and wetland buffers should be done by hand. Tree cutting in stream buffers should only target trees able to grow into a transmission line conductor clearance zone within 3 to 4 years. Cutting in such areas for construction or vegetation management should be minimized, and the disturbance of soil and remaining vegetation should be minimized. 			X
<ul style="list-style-type: none"> • The leaseholder should consult with the USFWS to address concerns regarding mine-water treatment ponds. Water pumped from mines should be diverted to a lined sedimentation pond for treatment. Settling ponds should be located in topographically low areas but not in any areas that are along drainages or near naturally flowing water. The treatment ponds should be constructed in accordance with applicable regulations. As applicable, the ponds should be fenced and netted to prevent use by wildlife (or livestock), including birds and bats. The lower 18 in. (46 cm) of the fencing should be a solid barrier that would exclude entrance by amphibians and other small animals. 		X ^q	
<ul style="list-style-type: none"> • Before mine entrances are closed during reclamation, conduct a summer and winter bat survey, if required, to determine the number and species of bats that could potentially occupy a site. Depending on the results of the surveys, undertake actions that could include the installation of bat gates. If bat surveys indicate no presence of bats, promptly close off all mine openings when finished with mining activities before bats have an opportunity to establish roosts or hibernacula. 		X ^q	

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> Use herbicides that have a low toxicity to wildlife and untargeted native plant species, as determined in consultation with the USFWS. Do not use herbicides near or in U.S. waters, including ponds, lakes, streams (intermittent or perennial), and wetlands, unless the herbicide is labeled for such uses. If herbicides are used in or near U.S. waters, the applicator shall ensure that the applications meet the requirements of the EPA's "Pesticide General Permit for Discharges from the Application of Pesticides." Determine setback distances in coordination with Federal and state resource management agencies. Before beginning any herbicide treatments, ensure that a qualified biologist has conducted surveys of bird nests and of sensitive species to identify the special measures or BMPs that are necessary to avoid and minimize impacts on migratory birds and sensitive species. The herbicides to be used would be approved by BLM through submission of "Pesticide Use Proposal" forms. The state-, county-, and BLM-listed plant species scheduled for eradication that are found in the project area would be eradicated and reported to BLM through submission of "Pesticide Application Records." 	X ^m		
<ul style="list-style-type: none"> If a transmission line is required, it should be designed and constructed in conformance with <i>Avian Protection Plan Guidelines</i> (APLIC and USFWS 2005), in conjunction with <i>Suggested Practices for Avian Protection on Power Lines</i> (APLIC 2006), to reduce the operational and avian risks that result from avian interactions with electric utility facilities. For example, transmission line support structures and other facility structures shall be designed to discourage their use by raptors for perching or nesting (e.g., by use of anti-perching devices). This would also minimize potential increased presence of ravens and raptors that may prey upon Gunnison sage-grouse. Shield wires should be marked with devices that have been scientifically tested and found to significantly reduce the potential for bird collisions. 		X ^q	
M-8 Minimize the establishment and spread of invasive (vegetative) species			
<ul style="list-style-type: none"> Monitor the area regularly and eradicate invasive species immediately. Use DOE-developed seed mixture and weed-free mulch. Clean vehicles to avoid introducing invasive weeds. 	X ^m		
	X ^m		X
M-9 Identify and protect cultural and historic resources			
<ul style="list-style-type: none"> Assure that all activities comply with Section 106 of the NHPA. Assure that all individuals performing cultural resources management tasks and services meet the Secretary of the Interior Standards for Archaeology and Historic Preservation. 	X		
	X		

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> Identify through searches of records, field surveys, and consultation with tribes, as necessary, all cultural resources in the area of potential effects and evaluate them for eligibility for inclusion on the NRHP. 	X		
M-10^f Minimize lighting to off-site areas; minimize contrast with surrounding areas			
<ul style="list-style-type: none"> Design lighting to provide the minimum illumination needed to achieve safety and security objectives. Minimize or eliminate lighting of off-site areas or the sky. All unnecessary lighting should be turned off at night to limit attracting migratory birds, bats, or other wildlife. 			X
<ul style="list-style-type: none"> Minimize the number of structures required. 			X
<ul style="list-style-type: none"> Construct low-profile structures whenever possible to reduce the structures' visibility. 			X
<ul style="list-style-type: none"> Repeat and/or blend materials and surface treatments (e.g., paint buildings) to correspond with the existing form, line, color, and texture of the landscape. 			X
<ul style="list-style-type: none"> Select appropriately colored materials for structures, or apply appropriate stains as coatings, so they blend with the backdrop of the lease tract. 			X
<ul style="list-style-type: none"> Use materials, coatings, or paints having little or no reflectivity whenever possible. 			X
<ul style="list-style-type: none"> Avoid installing gravel and pavement wherever possible to reduce contrasts in color and texture with the existing landscape to the extent practicable. 			X
<ul style="list-style-type: none"> Avoid downslope wasting of excess fill material. 			X
<ul style="list-style-type: none"> Control litter and noxious weeds by removing them regularly during mine development and operations. 			X
<ul style="list-style-type: none"> When accurate color rendition is not required (e.g., roadway, basic security), lighting should be amber in color, using either low-pressure sodium lamps or yellow LED lighting, or an equivalent. 		X	
<ul style="list-style-type: none"> Undertake interim restoration during the operating life of the mine, as soon as possible after disturbances have occurred. 		X ^p	
<ul style="list-style-type: none"> Ensure that lighting for structures on the mining sites does not exceed the minimum number of lights and brightness required for safety and security and does not cause excessive reflected glare. 		X	
<ul style="list-style-type: none"> Use full cut-off luminaires recommended or approved by the International Dark Sky Association to minimize uplighting; direct lights downward or toward the area to be illuminated. 			X
<ul style="list-style-type: none"> Ensure that light fixtures do not spill light beyond the lease tract boundaries to the extent practicable. 			X

TABLE S.5-1 (Cont.)

Measure Description		Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
M-11	Protect human health from radiological exposures			
	<ul style="list-style-type: none"> Monitor radon emissions and related operational conditions to obtain data for the estimation of more precise radon doses with respect to the potential exposures of nearby residents, including (1) monitoring the radon discharge concentration continuously whenever the mine ventilation system is operational, (2) measuring each mine vent exhaust flow rate, and (3) calculating and recording a weekly radon-222 emission rate for the mine. Model the dose to the nearest member of the public by using COMPLY-R, as required by 40 CFR Part 61, Subpart B. 	X		
	<ul style="list-style-type: none"> In cases where radon doses to nearby residents exceed the NESHAP (40 CFR Part 61 Subpart B) dose limit of 10 mrem/yr, implement one or more of the following measures to reduce the potential radon exposures: (1) increase the ventilation flow rate, (2) reroute ventilation flow, (3) reroute ventilation to a new vent, (4) modify the vent stack, (5) decrease the vent stack diameter, (6) increase the vent stack release height, or (7) construct additional bulkheads. 	X		
	<ul style="list-style-type: none"> Promptly and properly close off all mine openings and install warning signs of potentially high levels of radiation exposures when finishing the mining activities to prevent any inadvertent intrusion to the mine or getting too close to the mine openings. 		X	
	<ul style="list-style-type: none"> Assure an adequate thickness for the surface soil material covering waste-rock piles before seeding. The thickness should be adequate to prevent the underlying waste rocks from exposure to the ground surface over time. Through modeling and/or monitoring, evaluate measured uranium and decay product concentrations in waste rocks to determine whether the thickness is sufficient to mitigate potential radiation exposures. 		X	
	<ul style="list-style-type: none"> Develop an emergency rescue plan and ensure a trained rescue team can be dispatched immediately when needed. 		X	
M-12	Assure safe and proper transportation			
	<ul style="list-style-type: none"> Maintain the haul trucks for exclusive use only. Avoid using trucks for cartage of material other than uranium ore unless they have been properly cleaned for unrestricted use. 	X		
	<ul style="list-style-type: none"> Use a gravel track pad or similar method to minimize tracking of mud and dirt from any mine site onto the local public and county roads that provide site access. 			X
	<ul style="list-style-type: none"> Assure that uranium ore shipments proceed directly to the mill from the mine location. Identify locations for potential “safe havens” for temporary wayside parking or storage in the event there are unforeseen delays or scheduling issues associated with the mill. 		X ^s	

TABLE S.5-1 (Cont.)

Measure Description	Compliance Measure ^a	Mitigation Measure ^b	BMP ^c
<ul style="list-style-type: none"> • Assure that mine and mill operators are aware of the routes used for shipments of uranium ore. • The State of Colorado Highway Access Code recognizes the right of reasonable access, by development, to the state highway system, providing the development mitigates traffic impacts on the highway at the point of access to the state highway. This would also apply to the traffic generation/impacts from the lease tracts considered in the ULP PEIS. As a measure to minimize potential traffic impacts due to the ULP proposed action, the following steps would be taken by each lease operator prior to opening a mining operation on a lease tract: 		X ^s	
<ol style="list-style-type: none"> 1. The lessee should contact CDOT to meet for an access pre-application meeting to determine the size and scope of traffic impacts to be considered before submitting an access application. 			X
<ol style="list-style-type: none"> 2. The lessee shall submit a complete Access Permit Application to CDOT (Region 5 Access Permit Office) for its review. This application should include a traffic impact study (TIS) that identifies the directional distribution and daily and peak-hour volumes of traffic generated to identify if intersection improvements are warranted. Depending upon the size and impacts of a facility, the requirements for a TIS maybe waived for smaller operations, depending upon the outcome of the pre-application meeting. Typically the lessee would receive a response from CDOT within 20 days if additional documentation was needed before the permit would be completed. If CDOT accepted the application with no revisions, a permit would be issued or denied within 45 days of receipt of the application. If revisions were necessary, the application review period (20-day review) would restart upon receipt of the revised information by CDOT. 	X		
<ol style="list-style-type: none"> 3. The mine development constructs intersection improvements per the requirements of the access permit issued prior to commencement of the activity. 	X		

^a Compliance measures are those measures needed to fulfill regulatory requirements. Note that Appendix C of the lease agreement requires lessees to comply with all applicable statutes and regulations. Generic leases for the ULP are presented in Appendix A of the ULP PEIS.

^b Mitigation measures identified in the table include measures that are required by DOE as identified in current leases or that could be added to the leases when modified. DOE may also identify additional mitigation measures.

^c BMPs are those practices and activities generally implemented within the industry to conserve resources. These BMPs are not necessarily required by DOE but may be implemented to further reduce impacts.

^d See Appendix C, Section I of the lease agreement.

Footnotes continued on next page.

1 **TABLE S.5-1 (Cont.)**

-
- e Except for older diesel equipment meeting emissions requirements that need higher sulfur content for proper functioning.
 - f See Appendix C, Section L of the lease agreement.
 - g See Appendix C, Section J of the lease agreement.
 - h The CDRMS requires lessees to obtain permits for their mining operations and to submit and follow an EPP. Runoff and run-on are specifically addressed on a site-by-site basis, as are issues concerning hydrology and reestablishment of vegetation.
 - i Article XIII MINING PLAN of the lease agreement addresses the process for reclamation; the ULP will work with the BLM to identify and clear local sources of borrow material.
 - j See Appendix C, Section M of the lease agreement; also required to be submitted under Article XII EXPLORATION PLAN of the lease agreement.
 - k See Appendix C, Sections G and H of the lease agreement, which address the location of mining infrastructure.
 - l See Appendix C, Section T of the lease agreement (for applicable lease tracts).
 - m Requirement of the surface management agency, BLM.
 - n Chisel plowing is a method used to alleviate shallow soil compaction by inserting a narrow tool in soil to depths of at least 14 in. (35 cm).
 - o Subsoiling is a method used to alleviate shallow soil compaction by tillage of soil to depths of at least 14 in. (35 cm).
 - p See Appendix C, Section H of the lease agreement.
 - q Measure per CPW.
 - r Primary source of information is USDA and DOI (2007).
 - s See Appendix C, Section P of the lease agreement.

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March 2014

1 S.6 CUMULATIVE IMPACTS

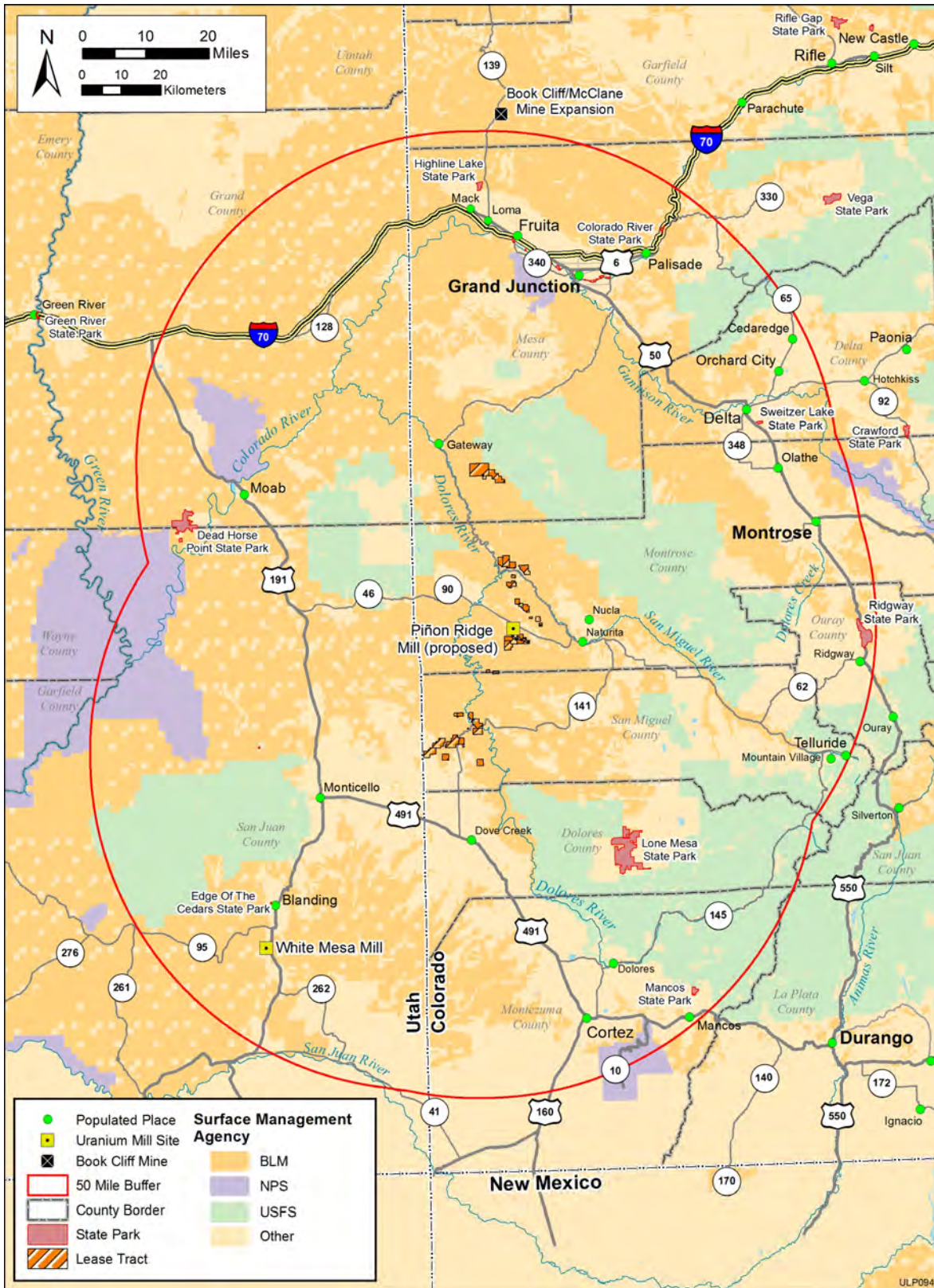
2
3 Potential impacts from the five alternatives in the ULP PEIS are considered in
4 combination with impacts of past, present, and reasonably foreseeable future actions. For this
5 cumulative impacts analysis, past projects are generally assumed to be reflected in the affected
6 environment discussion. Projects that have been completed, such as the exploration and
7 reclamation activities implemented under the ULP in 2009 and 2011, are generally assumed to
8 be part of the baseline conditions that were analyzed under the five alternatives
9 (see Sections S.3.1.1 through S.3.1.5). As mentioned previously, the ROI for cumulative effects
10 is conservatively assumed to be a 50-mi (80-km) radius (see Figure S.6-1). For most of the
11 resource areas, a 25-mi (40-km) radius was identified as the ROI. The analyses for potential
12 environmental justice impacts and potential impacts on the human health of the population
13 generally addressed a 50-mi (80-km) radius, which is why the ROI for cumulative effects was
14 extended to this larger radius (see Appendix D of the ULP PEIS for information on how the
15 radius was identified as the ROI for each resource area).

16
17 The major ongoing projects that are related to uranium mining activities proposed under
18 the five alternatives evaluated in the ULP PEIS include (1) the White Mesa Mill; (2) various
19 permitted uranium mining projects in Montrose, Mesa, and San Miguel Counties, none of which
20 are currently actively producing (of the 33 permitted projects, a few of the permits are for mines
21 on the DOE ULP lease tracts); (3) the Daneros Mine; (4) the Energy Queen Mine, which is
22 operational but currently inactive; and (5) the ongoing reclamation of abandoned uranium mines
23 (these mines are not on the DOE ULP lease tracts). There are also several foreseeable projects
24 related to uranium mining, which are currently in the planning phase. These include the Piñon
25 Ridge Mill⁵ and the Whirlwind Mine near Gateway.

26
27 Projects that are not related to uranium mining include the operating Nucla Station Power
28 Plant; the Lisbon Natural Gas Processing Plant; the New Horizon Coal Mine; other mineral
29 mining projects (for sand, gravel, gold, quartz, and granite); oil and gas exploration, transmission
30 line, and transportation right-of-way (ROW) projects; grazing and wildlife and vegetation
31 management projects; and National Monument improvement projects.

32
33 The environmental impacts discussion in Section S.4 (and summarized in Tables S.4-2
34 through S.4-7) concludes that potential impacts on the resource areas evaluated for the five

⁵ Energy Fuels Resources Corporation has planned to construct the Piñon Ridge Mill (a conventional uranium mill) in Paradox Valley, between Naturita and Bedrock in Montrose County, Colorado. In early 2011, the CDPHE issued a final radioactive materials license to Energy Fuels Resources Corporation (which is an asset of Ontario's Energy Fuels, Inc., located in Lakewood, Colorado), following CDPHE's preparations of a decision analysis and environmental impact analysis (CDPHE 2011). A group of plaintiffs then challenged that license by filing a lawsuit against CDPHE in Colorado's District Court for the City and County of Denver. On June 13, 2012, the court issued a decision in which it held that the CDPHE had unlawfully issued the license without conducting the necessary administrative procedures. The court set aside CDPHE's action in issuing the license, remanded the case for further proceedings, and ordered CDPHE to convene an additional hearing scheduled for April 2013. On April 25, 2013, CDPHE decided to issue to Energy Fuels Resources Corporation a final radioactive materials license that imposed a number of conditions on the construction and operation of the proposed Piñon Ridge Mill (CDPHE 2013). In May 2013, a group of plaintiffs filed for judicial review of that CDPHE decision in the District Court for the City and County of Denver.



1

2

FIGURE S.6-1 Region of Influence for Cumulative Effects

1 alternatives generally would be negligible to moderate and could be further minimized by
2 implementing the compliance and mitigation measures and/or BMPs as required by project-
3 specific mine plans. Estimates for potential human health impacts indicate that the emission of
4 radon would be the primary source of potential human health radiation exposure. However,
5 requirements for monitoring and ventilating mine operations and for worker safety are expected
6 to mitigate potential impacts on human health. The potential radon dose estimates presented in
7 the ULP PEIS were calculated by using conservative assumptions that the radon emission rate is
8 proportional to the cumulative uranium production and the uranium mines have been in
9 operation for 10 years. The actual radon dose would be much lower if measured radon data and
10 the actual number of years of operation were used to obtain the radon exposure estimates.

11
12 Although the various present, ongoing, and planned projects identified in the ROI for
13 cumulative effects could contribute to impacts on the various environmental resource areas
14 evaluated, it is expected that uranium-mining-related projects would be most similar with respect
15 to the types of potential environmental impacts that could occur, and most of these are located
16 closer to (within 25 mi or 40 km of) the lease tracts. However, information for most of the
17 projects is either not available or qualitative in nature.

18
19 Potential impacts from the five alternatives would generally be negligible to moderate.
20 The potential (incremental) impacts from the five alternatives are tabulated in Tables S.4-2
21 through S.4-7.

22
23 For specific resources, the cumulative impacts as well as the incremental contributions to
24 these impacts from implementation of the ULP under any of the five alternatives are summarized
25 below:

- 26
27 • *Air quality.* Because of the relatively low population density, low level of
28 industrial activities, and relatively low traffic volume in the ULP region, the
29 quantity of anthropogenic emissions is small and the ambient air quality is
30 relatively good. Particulate emissions associated with ongoing actions in the
31 region, such as White Mesa Mill and uranium mining, and planned actions,
32 such as Piñon Ridge Mill, are not expected to exceed ambient air quality
33 standards. Cumulative impacts on air quality in the ULP region are therefore
34 considered to be minor. Under Alternatives 1 and 2, emissions of particulate
35 matter with a mean diameter of 10 μm or less (PM_{10}) and nitrogen oxides
36 (NO_x) during reclamation are estimated to be less than 1% and 0.1% of the
37 emission totals, respectively, for the Colorado counties (Mesa, Montrose, and
38 San Miguel) encompassing the ULP lease tracts. Under Alternatives 3 through
39 5, PM_{10} and NO_x emissions are estimated to be highest during the
40 development and operations phase, ranging from 1.5 to 3.2% (PM_{10}) and 1.0
41 to 2.3% (NO_x) of emission totals. The contribution of any alternative to
42 cumulative impacts in the region is expected to be negligible to minor. None
43 of the ULP alternatives would cause measurable impacts on regional ozone or
44 AQRVs at nearby Class 1 areas.
45

- 1 • *Acoustic environment.* There are no sensitive receptors (such as hospitals or
2 schools) within 3 mi (5 km) of the ULP lease tracts, and only 17 residences lie
3 within 1 mi (1.6 km) of the lease tracts (7 of which are adjacent to a lease
4 tract). Although there are no noise surveys of the immediate vicinity, it is
5 likely that the highest human-caused noise levels (in the range of 50 to
6 60 dBA) in the ULP region are intermittent and associated with state
7 highways and agricultural/industrial activities. Planned and ongoing actions,
8 such as the Piñon Ridge Mill and uranium mining, are not expected to exceed
9 the maximum permissible noise levels. Noise-related cumulative impacts are
10 therefore considered minor. Noise levels associated with reclamation activities
11 under Alternatives 1 and 2 would be about 55 dBA at a distance of about
12 1,650 ft (500 m) from the reclamation site; this is the Colorado daytime
13 maximum permissible limit in a residential zone. Under all alternatives, noise-
14 related impacts are expected to be local and intermittent and, therefore, minor.
15 Noise levels could exceed the Colorado limit at Lease Tract 13 under
16 Alternatives 1 through 3 and at Lease Tracts 13, 13A, 16, and 16A under
17 Alternatives 4 and 5, if any activities occurred near the boundary. The
18 contribution of any of the five ULP alternatives to cumulative noise-related
19 impacts in the region is expected to be minor.
20
- 21 • *Paleontological resources.* Significant paleontological resources within the
22 ULP lease tracts (the ROI for cumulative effects) are associated with
23 stratigraphic units of Jurassic and Cretaceous age. The PFYC ranking of the
24 Jurassic-age Morrison Formation, the main source of uranium in the lease
25 tracts and the geologic unit most likely to be affected by future mining, is 5
26 (very high), indicating that it is highly fossiliferous and most at risk for
27 human-caused adverse impacts or natural degradation. Other uranium mines
28 in the region have acknowledged the potential for discovering or damaging
29 vertebrate fossils within in the Morrison Formation. Because there are
30 compliance-driven measures governing the management of paleontological
31 resources on Federal lands, the cumulative impacts on these resources are
32 considered to be minor. Lessees would follow requirements set forth in
33 project-specific paleontological management plans prepared in consultation
34 with the BLM. Therefore, the contribution of any of the five ULP alternatives
35 to cumulative impacts on paleontological resources is expected to be minor.
36
- 37 • *Soil resources.* Cumulative impacts on soil resources within and adjacent to
38 the ULP lease tracts (the ROI for cumulative effects) would result mainly
39 from ground-disturbing activities associated with mining activities under any
40 of the five alternatives. These impacts are expected to be minor to moderate,
41 but they would be short in duration and generally controlled through
42 mitigation measures and BMPs.
43
- 44 • *Water resources.* Water resources in the ROI for cumulative effects include
45 surface water in the Upper Dolores, San Miguel, and Lower Dolores
46 watersheds; groundwater in the bedrock aquifers within Paradox Basin; and

1 alluvial aquifers within the various canyons along the Dolores and San Miguel
2 Rivers. Cumulative impacts on stream flow in the Dolores River are
3 considered moderate due mainly to the effects of regulated flow by the
4 McPhee Dam located upstream of the ULP lease tracts. Changes in the water
5 cycle due to seasonal shifts in precipitation (and a decline in snowpack) are
6 projected to cause up to a 20% decrease in runoff in the Upper Colorado River
7 Basin (of which the Dolores and San Miguel Rivers are a part) in the
8 foreseeable future; the decrease in runoff will also affect recharge rates in
9 aquifers throughout the region. Water consumption, especially in terms of
10 irrigation from surface water sources, is already on the decline because of
11 regional drought conditions, and this trend is likely to continue into the
12 foreseeable future. In terms of water quality, the cumulative impacts on
13 groundwater and surface water in the Paradox Basin are considered to be
14 moderate, due mainly to the naturally high saline groundwater that discharges
15 to the Dolores River in Paradox Valley. Activities associated with ongoing
16 actions in the region, such as the White Mesa Mill and uranium mining, and
17 planned actions such as the Piñon Ridge Mill, could reduce runoff to the
18 Dolores River; however, water quality impacts are not expected. Under all
19 five alternatives, minor impacts on water quality could occur as a result of
20 land disturbance and underground mining activities associated with mine
21 development, operations, and reclamation; these impacts would be minimized
22 by the implementation of compliance and mitigation measures and/or BMPs
23 (Table S.5-1). Minor (local and temporary) impacts on stream flow are also
24 expected.

- 25
- 26 • *Human health.* Exposures from background radiation sources within a 50-mi
27 (80-km) radius of the ULP lease tracts were estimated on the basis of two
28 hypothetical scenarios: (1) considering an individual who lives near
29 (i.e., 1,600 to 16,000 ft [500 to 5,000 m]) the lease tracts and (2) considering
30 an individual pumping out groundwater from a well for drinking. Potential
31 dose estimates show that an individual could receive a dose of about
32 120 mrem/yr from ambient gamma radiation, 290 mrem/yr from inhalation of
33 radon, 0.47 mrem/yr from breathing airborne radionuclides in resuspended
34 dust particles, and 25 mrem/yr from drinking untreated well water. The
35 probability that such a person would incur a latent cancer fatality (LCF) is
36 estimated to be about 5×10^{-4} (i.e., 1 in 2,000 [2×10^3]). Dose estimates
37 associated with White Mesa and Piñon Ridge Mills (to the nearest receptor at
38 the site boundary) range from 5.8 to 8.2 mrem/yr. The contribution of any of
39 the five ULP alternatives to cumulative impacts due to radiation exposure in
40 the region is expected to be negligible, ranging only from 1 to 10 mrem/yr for
41 a resident living more than 1.5 mi (2,500 m) from the lease tract. The potential
42 dose could be higher if the distance is less than 1.5 mi (2,500 m), but the dose
43 would still be less than 31 mrem/yr, which corresponds to a probability of
44 4×10^{-5} to develop a latent fatal cancer (i.e., 1 in 2,500 [2.5×10^4]).
45

- 1 • *Ecological resources (vegetation)*. The ROI for cumulative effects (Montrose,
2 Mesa, and San Miguel Counties) supports a wide variety of vegetation types,
3 primarily woodlands and shrublands. Incremental impacts on vegetation result
4 mainly from ground disturbance (which can destroy vegetation and introduce
5 non-native species); indirect impacts include deposition of fugitive dust, soil
6 erosion, sedimentation, and changes in water quantity or quality. Impacts are
7 expected to be minor to moderate; establishment of native plant communities
8 during reclamation would reduce impacts over the long term.
9
- 10 • *Ecological resources (wildlife)*. Incremental impacts on wildlife in the region
11 of cumulative effects (Montrose, Mesa, and San Miguel Counties) result
12 mainly from habitat disturbance. Such impacts could be minor to moderate in
13 the short term but would be localized and would not affect the viability of
14 wildlife populations.
15
- 16 • *Ecological resources (aquatic biota)*. Impacts on aquatic resources could
17 result from increases in sedimentation and turbidity from soil erosion and
18 runoff during mine development and operations. There would be a very low
19 likelihood of an accidental ore spill into a perennial stream or river. Overall,
20 localized impacts on aquatic biota would range from negligible to moderate
21 and would not affect the viability of any aquatic species.
22
- 23 • *Ecological resources (threatened, endangered, and sensitive species)*.
24 Potential impacts on threatened, endangered, and sensitive species could range
25 from small to moderate and short term to long term, depending on the location
26 of the mines and amount of surface disturbance. Direct impacts could result
27 from the destruction of habitats during site clearing, excavation, and
28 operations. Indirect impacts could result from fugitive dust, erosion,
29 sedimentation, and impacts related to altered surface water and groundwater
30 hydrology. The USFWS concluded that implementation of the best
31 management practices related to aquatic habitats and water quality will reduce
32 water quality impacts to the extent that they are insignificant.
33

34 Water withdrawals from the Upper Colorado River Basin to support mining
35 activities may result in potentially unavoidable impacts on aquatic biota
36 (particularly the Colorado River endangered fish species). For this reason,
37 DOE determined in its May 2013 BA that ULP activities under Alternative 3
38 may affect, and are likely to adversely affect, the Colorado River endangered
39 fish species and their critical habitat. The USFWS then concluded, in its
40 August 2013 BO, that water depletions under Alternative 3 were not likely to
41 jeopardize the continued existence of the Colorado River endangered fish
42 species and not likely to destroy or adversely modify designated critical
43 habitat; that a water depletion fee did not apply (under a 2010 BO that
44 addressed small water depletions); and that further programmatic consultation
45 is not required (Appendix E of the ULP PEIS).
46

- 1 • *Land use.* Most of the lands surrounding the ULP lease tracts are managed by
2 the BLM under its “multiple use” management framework. These lands are
3 currently managed for uses that include conservation, recreation, agriculture
4 (including grazing), rangeland, and minerals (via mining, leasing, and free
5 use). Because these lands are managed under the authority of the BLM and
6 U.S. Forest Service, the cumulative impacts within the 25-mi (40-km) radius
7 (the ROI for cumulative effects) are considered to be minor. Lands within the
8 Uravan Mineral Belt, including those on which the ULP lease tracts are
9 located, were withdrawn from mineral entry in 1948 in order to reserve them
10 for the exploration and development of uranium and vanadium resources.
11 Under Alternatives 1 and 2, all mining activities on these lands would cease,
12 and other activities within the lease tracts would continue. The contributions
13 of the ULP to cumulative impacts in the region would be minor since there
14 would be no conflict between mining and other uses. Under Alternatives 3
15 through 5, mining activities within the lease tracts may preclude certain other
16 uses (such as recreation and grazing), but their contributions to cumulative
17 impacts would also be considered minor since the surrounding lands offer
18 ample opportunity for these other uses.
19
- 20 • *Socioeconomics.* Cumulative socioeconomic impacts result from changes in
21 employment opportunities and income, expenditures for goods and services,
22 and tax revenues associated with various types of commercial, industrial, and
23 recreational activities that are taking place within the ROI for cumulative
24 effects (Montrose, Mesa, and San Miguel Counties). These impacts are
25 generally considered beneficial to local communities, counties, and states.
26 Unemployment in the three-county region is currently 9.6% (2011). Under
27 Alternatives 1 and 2, socioeconomic impacts are expected to be minor,
28 increasing the total employment by about 0.1% in the region. Under
29 Alternatives 3 through 5, impacts would also be minor, increasing the total
30 employment by less than 1% in the region.
31
- 32 • *Environmental justice.* Cumulative environmental justice impacts would
33 encompass any (and all) human health and environmental impacts that could
34 be disproportionately high and adverse on minority or low-income
35 populations; however, there are no minority or low-income populations, as
36 defined by CEQ guidelines, within the ROI for cumulative effects. As a result,
37 there would be no anticipated cumulative impacts on these populations, and
38 no contribution to these impacts from any of the five ULP alternatives.
39
- 40 • *Transportation.* Most roads in the ROI for cumulative effects pass through
41 uninhabited public lands; however, routes used to haul uranium ore over the
42 past 10 to 30 years pass 13 of 15 residences along the ULP lease tracts. Traffic
43 volume along these routes is expected to increase with the continued operation
44 of White Mesa Mill, the construction of Piñon Ridge Mill, and future uranium
45 mining in the region. Under Alternatives 1 and 2, there would be no transport
46 of uranium ore and therefore no change in current traffic trends. Ore

1 shipments under Alternatives 3 through 5 would increase truck traffic along
2 affected routes and would contribute to cumulative impacts, such as human
3 exposure to low levels of radiation, increased traffic, and potential accidents.
4 It is estimated that the number of shipments from mines to mills could be as
5 high as 92 per day under Alternative 5. The average external dose rate is about
6 0.1 mrem/h at 6.6 ft (2 m), two orders of magnitude lower than the regulatory
7 maximum. Estimated potential impacts include no LCFs to the collective
8 population, no traffic fatalities, and possibly one traffic injury under
9 Alternatives 4 and 5.

- 10
- 11 • *Cultural resources.* Incremental impacts from the five ULP alternatives could
12 result from vandalism, theft, and damage or destruction of cultural artifacts
13 within the lease tracts or in adjacent areas affected by mining activities.
14 Adverse impacts on traditional cultural properties are also counted among the
15 direct impacts on cultural resources. Direct impacts on these resources are not
16 expected under Alternatives 1 and 2; however, vandalism and theft are
17 possible impacts because of greater site accessibility. Ground disturbance
18 under Alternatives 3 through 5 could damage or destroy artifacts and
19 traditional cultural properties, and artifacts could be lost through vandalism or
20 theft as a result of improved site access. Such impacts would be minimized or
21 avoided, since all activities would comply with Section 106 of the NHPA.
22
 - 23 • *Visual resources.* Incremental impacts from the five ULP alternatives relate
24 mainly to alterations to vegetation and landforms, removal of structures and
25 materials, changes to roadways, and changes in vehicular and work activities.
26 Although impacts associated with exploration are generally expected to be
27 minor, potential long-term impacts could result from mine development and
28 operations, as would occur under Alternatives 3 through 5, because activities
29 during these phases could increase contrasts in form, line, color, and texture.
30 The magnitude of these impacts would need to be determined at the project
31 level.
32
 - 33 • *Waste management.* Incremental impacts on waste management within the
34 lease tracts (the ROI for cumulative effects for waste management) are
35 associated with the generation of waste from the various mining phases. These
36 impacts are expected to minor under all five of the ULP alternatives.
37

38 Potential cumulative impacts on the various environmental resources (e.g., air quality,
39 water quality, soils, ecological resources, socioeconomics, transportation) and human health
40 from various past, present, and reasonably foreseeable projects and activities within the 50-mi
41 (80-km) ROI, which include the impact of these activities when added to activities related to the
42 ULP, would vary by resource but would generally range from negligible to moderate (see
43 Table S.4-1). The overall contribution of the ULP to these impacts is considered to be minor.⁶

⁶ Because of the qualitative nature of information presented for most projects or activities in the ROI for cumulative effects, it is not possible to determine an overall cumulative impact in a quantitative sense. Even for projects where quantitative results are calculated or estimated, (e.g., for air emissions, human health doses,

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transportation, and socioeconomics), the methodology and associated assumptions used for the calculations vary, making definitive comparisons among projects difficult. For the ULP PEIS, the potential incremental impacts of the five alternatives are based on conservative assumptions and mostly do not take credit for measures (compliance measures, mitigation measures, and BMPs) that would minimize the potential impacts. Hence, it is expected that the potential incremental impacts of the ULP would be less than those summarized in S.4-2 through S.4-7, since such measures would be implemented as required by project-specific mine plans and permits.

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