



United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
<http://www.blm.gov>



January 27, 2012

Dear Reader:

In 2008, the Bureau of Land Management (BLM) amended eight land use plans in Colorado, Utah, and Wyoming to make public lands available for potential leasing and development of oil shale resources, and two other land use plans to expand the acreage available for potential tar sands leasing in Utah, where these resources are located. These 2008 Amendments, supported by the preparation of a Programmatic Environmental Impact (PEIS) Statement required under Section 369(d)(1) of the Energy Policy Act of 2005, made approximately 2,000,000 acres available for potential development of oil shale resources and 431,000 acres available for potential development of tar sands resources. The 2008 PEIS and Record of Decision (ROD) amending the land use plans are available at <http://ostseis.anl.gov>, which includes maps and more specific information about the geographic area studied in 2008.

The BLM has decided to take a fresh look at the land use plan allocation decisions made in the 2008 ROD associated with the PEIS in order to reconsider which lands should be open to future leasing of oil shale and tar sands resources. The purpose and need for the proposed planning action is to reassess the appropriate mix of allowable uses with respect to oil shale and tar sands leasing and potential development.

Attached for your review and comment is the *Draft Resource Management Plan (RMP) Amendments and Draft PEIS for the Allocation of Oil Shale and Tar Sands Resources on Lands Administered by the BLM in Colorado, Utah, and Wyoming*. The BLM prepared this document in consultation with cooperating agencies and in accordance with the National Environmental Policy Act of 1969, the Federal Land Policy and Management Act of 1976, implementing regulations, the BLM *Land Use Planning Handbook* (H-1610-1), and other applicable laws. The *Draft RMP Amendments and Draft PEIS* and supporting information are also available on the project Web site at <http://osts.eis.anl.gov>.

This PEIS examines alternatives for making BLM-administered lands available for application for future commercial leasing of both oil shale and tar sands resources. The study area for the oil shale resources includes the most geologically prospective resources of the Green River Formation located in the Piceance, Uinta, Green River, and Washakie Basins. The oil shale planning area consists of about 3,538,038 acres, which includes 2,138,361 acres of public lands and 158,566 acres of split estate lands.

The study area for tar sands includes those locations designated as Special Tar Sands Areas in the geologic reports prepared by the United States Geological Survey in 1980 and formalized by Congress in the Combined Hydrocarbon Leasing Act of 1981 (P.L. 97-78). The tar sands planning area consists of about 1,026,266 acres of land, which includes about 574,357 acres of public lands and 82,148 acres of split estate lands.

The BLM encourages the public to provide information and comments pertaining to the analysis presented in the *Draft RMP Amendments and Draft PEIS*. Of particular importance is feedback concerning the adequacy and accuracy of the proposed alternatives, the analysis of their respective management decisions, and any new information that would help the BLM produce a Proposed Plan. In developing the Proposed RMP/Final PEIS, which is the next phase of the planning process, the decisionmaker may select various management decisions from each of the alternatives analyzed in the Draft RMP/PEIS to create a management strategy that best meets the needs of the resources and values in this area under the multiple-use and sustained-yield mandate. As a member of the public, your timely comments will help formulate the Proposed RMP/Final PEIS. The BLM will accept comments for 90 calendar days following the U.S. Environmental Protection Agency's publication of its *Notice of Availability* of the document in the *Federal Register*. The BLM can best utilize your comments and resource information submissions if received during the review period.

Comments may be submitted electronically at <http://ostseis.anl.gov/involve/comments/index.cfm>. A comment form can be found online at this site. Comments may also be submitted by mail to BLM Oil Shale and Tar Sands PEIS, Argonne National Laboratory, EVS Division, Building 240, 9700 South Cass Avenue, Argonne, Illinois 60439. To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments in electronic format.

Your review and comments on the content of this document are critical to the success of this planning effort. If you wish to submit comments on the Draft RMP/PEIS, we suggest that you make them as specific as possible. Comments will be more helpful if they include suggested changes, sources, or methodologies, and reference a section or page number. The BLM will consider comments containing only opinions or preferences and include them as part of the decision-making process; although, they will not receive a formal response from the BLM.

Before including your address, phone number, email address, or other personal identifying information, you should be aware your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

We will schedule Public Open Houses to provide the public an overview of the document and responses to any questions about the PEIS. We will announce the meetings through the public media in the near future and on the BLM Web site at <http://osts.eis.anl.gov>.

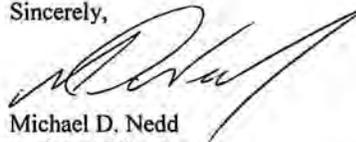
Copies of the Draft RMP/PEIS have been sent to affected Federal, state, and local government agencies. Copies of the Draft RMP/PEIS are available for public inspection at the following BLM locations:

- Colorado State Office, 2850 Youngfield Street, Lakewood, Colorado 80215;
- Northwest District Office, 2815 H Road, Grand Junction, Colorado 81506;
- Colorado River Valley Field Office, 2300 River Frontage Road, Silt, Colorado 81652;
- Grand Junction Field Office, 2815 H Road, Grand Junction, Colorado 81506;
- White River Field Office, 220 East Market Street, Meeker, Colorado 81641;
- Utah State Office, 440 West 200 South, Suite 500, Salt Lake City, Utah 84101;
- Green River District Office, 170 South 500 East, Vernal, Utah 84078;
- Vernal Field Office, 170 South 500 East, Vernal, Utah 84078;
- Price Field Office, 125 South 600 West, Price, Utah 84501;
- Color Country District Office, 176 East D.L. Sargent Drive, Cedar City, Utah 84721;
- Richfield Field Office, 150 East 900 North, Richfield, Utah 84701;
- Canyon Country District Office, 82 East Dogwood, Moab, Utah 84532;
- Monticello Field Office, 365 North Main, Monticello, Utah 84535;
- Wyoming State Office, 5353 Yellowstone Road, Cheyenne, Wyoming 82009;
- High Desert District Office, 280 Highway 191 North, Rock Springs, Wyoming 82901;
- Rock Springs Field Office, 280 Highway 191 North, Rock Springs, Wyoming 82901;
- Kemmerer Field Office, 312 Highway 189 North, Kemmerer, Wyoming 83101;
and
- Rawlins Field Office, 1300 North Third, Rawlins, Wyoming 82301.

Thank you for your continued interest in the *Draft Resource Management Plan (RMP) Amendments and a Draft Programmatic Environmental Impact Statement (PEIS) for the Allocation of Oil Shale and Tar Sands Resources on Lands Administered by the BLM in Colorado, Utah, and Wyoming*. We appreciate the information and suggestions you have contributed to the planning process.

For additional information or clarification regarding this document or the planning process, please contact Sherri Thompson, Project Manager, Bureau of Land Management, Colorado State Office, 2850 Youngfield Street, Lakewood, Colorado 80215-7093, or visit the Web site at <http://osts.eis.anl.gov>.

Sincerely,



Michael D. Nedd
Assistant Director
Minerals and Realty Management

DES 12-01

Draft Programmatic Environmental Impact Statement and Possible Land Use Plan Amendments for Allocation of Oil Shale and Tar Sands Resources on Lands Administered by the Bureau of Land Management in Colorado, Utah, and Wyoming

January 2012

Volume 1: Chapters 1, 2, & 3

U.S. Department of the Interior
Bureau of Land Management



MISSION STATEMENT

It is the mission of the Bureau of Land Management (BLM), an agency of the Department of the Interior, to manage BLM-administered lands and resources in a manner that best serves the needs of the American people. Management is based upon the principles of multiple use and sustained yield taking into account the long-term needs of future generations for renewable and nonrenewable resources.

BLM-WO-GI-08-005-3900

DOI No. DES 12-01

**Draft Programmatic Environmental Impact Statement and Possible Land Use Plan
Amendments for Allocation of Oil Shale and Tar Sands Resources on Lands Administered
by the Bureau of Land Management in Colorado, Utah, and Wyoming**

Lead Agency: U.S. Department of the Interior, Bureau of Land Management

Cooperating Agencies:

National Park Service	Garfield County, Colorado
U.S. Fish and Wildlife Service	Duchesne County, Utah
State of Utah	Carbon County, Utah
State of Wyoming	Uintah County, Utah
City of Rifle, Colorado	Lincoln County, Wyoming
Grand County, Utah	Sweetwater County, Wyoming
State of Colorado, Department of Natural Resources and Department of Health and the Environment	Coalition of Local Governments

Location: Northwestern Colorado, Eastern Utah, and Southwestern Wyoming

Abstract: The Bureau of Land Management (BLM) proposes to amend 10 land use plans in Colorado, Utah, and Wyoming to describe those areas that will be open and those that will be closed to application for commercial leasing, exploration, and development of oil shale and tar sands resources. There are approximately 2.3 million acres of BLM-administered lands within this area that are the subject of this programmatic environmental impact statement (PEIS). The Programmatic EIS analyzes four alternatives in detail for allocation of oil shale (two of these include subalternatives), and four analogous alternatives for allocation of tar sands. The BLM has selected Alternative 2(b) as the Preferred Alternative. The Preferred Alternative would make approximately 461,965 acres available for future consideration for commercial oil shale leasing and 91,045 acres available for application for commercial tar sands leasing, but only for research, development, and demonstration (RD&D) leases. The BLM would issue a commercial lease only when a lessee satisfies the conditions of its RD&D lease and the regulations at 43 CFR Subpart 3926 for conversion to a commercial lease. The preference right acreage, if any, which would be included in the converted lease, would be specified in the RD&D lease. Alternative 1, the No Action Alternative, would not amend land use plans. The lands available for lease under the 2008 land use plan amendment decisions would remain available for future leasing consideration. Alternative 2(a) would exclude certain lands from leasing and would amend 10 land use plans in Colorado, Utah, and Wyoming to make approximately 461,965 acres available for future consideration for commercial oil shale leasing and 91,045 acres available for application for commercial tar sands leasing. Alternative 3 would amend 10 land use plans in Colorado, Utah, and Wyoming to limit public lands available for commercial leasing to the those lands encompassed by existing oil shale RD&D leases and their associated preference right lease acreage, plus the areas encompassed by the three RD&D lease applications currently under review. Under this alternative, 32,640 acres would be open for potential future leasing of oil shale. For the tar sands resources under Alternative 3, the lands identified as available for application for commercial leasing would be limited to those lands in the Vernal, Utah, planning area, for which there is a pending tar sands lease application (approximately 2,100 acres). Alternative 4(a) would exclude certain lands from commercial oil shale or tar sands leasing, similar to Alternative 2 and would amend 10 land use plans in Colorado, Utah, and Wyoming to designate acreage less than 2,017,714 acres as available for future consideration for leasing for commercial oil shale leasing and less than 430,686 acres as available for application for commercial tar sands leasing. Alternative 4(b) would open the same acreage as those lands opened in Alternative 4(a) but only for RD&D leases. The BLM

would issue a commercial lease only when a lessee satisfies the conditions of its RD&D lease and the regulations at 43 CFR Subpart 3926 for conversion to a commercial lease. The preference right acreage, if any, which would be included in the converted lease, would be specified in the RD&D lease. This PEIS has been developed to analyze the direct, indirect, and cumulative environmental, cultural, and socioeconomic impacts of the four alternatives. While the BLM has determined that there are no environmental impacts associated with the amendment of land use plans, it is intending to establish a commercial leasing program to facilitate future development and has included a programmatic-level analysis of the potential impact of oil shale and tar sands development technologies as they are currently known.

Contacts: For further information about this PEIS, you may contact Sherri Thompson, Project Manager, BLM Colorado State Office, 2850 Youngfield Street, Lakewood, Colorado 80215-7093; (303) 239-3758.

Comments: The public will have 90 days to review and comment on the document from the date the U.S. Environmental Protection Agency files the Notice of Availability for the PEIS in the *Federal Register*. For the most recent information on document filing status, or for additional information regarding the PEIS, please see the project Web site at <http://ostseis.anl.gov>.

Responsible Official:

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NOTATION

The following is a list of acronyms and abbreviations, chemical names, and units of measure used in this document. Some acronyms used only in tables may be defined only in those tables.

GENERAL ACRONYMS AND ABBREVIATIONS

11	ACEC	Area of Critical Environmental Concern
12	AGFD	Arizona Game and Fish Department
13	AGR	aboveground retort
14	AIRFA	American Indian Religious Freedom Act
15	AMSO	American Shale Oil LLC
16	ANFO	ammonium nitrate and fuel oil
17	API	American Petroleum Institute
18	APLIC	Avian Power Line Interaction Committee
19	APP	Avian Protection Plan
20	AQRV	air quality related value
21	ARCO	Atlantic Richfield Company
22	ATP	Alberta Taciuk Process
23	ATSDR	Agency for Toxic Substances and Disease Registry
24	AWEA	American Wind Energy Association
25		
26	BA	biological assessment
27	BCD	barrels per calendar day
28	BLM	Bureau of Land Management
29	BMP	best management practice
30	BO	biological opinion
31	BOR	U.S. Bureau of Reclamation
32	BPA	Bonneville Power Administration
33	BSD	barrels per stream day
34	BTEX	benzene, toluene, ethylbenzene, and xylenes
35		
36	CAA	Clean Air Act
37	CAPP	Canadian Association of Petroleum Producers
38	CARB	California Air Resources Board
39	CASTNET	Clean Air Status and Trends NETWORK
40	CBOSC	Cathedral Bluffs Oil Shale Company
41	CCW	coal combustion waste
42	CDC	Centers for Disease Control and Prevention
43	CDOT	Colorado Department of Transportation
44	CDOW	Colorado Division of Wildlife
45	CDPHE	Colorado Department of Public Health and Environment
46	CDW	Colorado Division of Wildlife

1	CEQ	Council on Environmental Quality
2	CFR	<i>Code of Federal Regulations</i>
3	CHL	combined hydrocarbon lease
4	CIRA	Cooperative Institute for Research in the Atmosphere
5	COGCC	Colorado Oil and Gas Conservation Commission
6	CPC	Center for Plant Conservation
7	CRBSCF	Colorado River Basin Salinity Control Forum
8	CRSCP	Colorado River Salinity Control Program
9	CWRQIP	Colorado River Water Quality Improvement Program
10	CSS	cyclic steam stimulation
11	CSU	Controlled Surface Use
12	CWA	Clean Water Act
13	CWCB	Colorado Water Conservation Board
14		
15	DoD	U.S. Department of Defense
16	DOE	U.S. Department of Energy
17	DOI	U.S. Department of the Interior
18	DOL	U.S. Department of Labor
19	DOT	U.S. Department of Transportation
20	DRMS	Division of Reclamation Mining & Safety (Colorado)
21		
22	EA	environmental assessment
23	EGL	EGL Resources, Inc.
24	EIA	Energy Information Administration
25	E-ICP	bare electrode in situ conversion process
26	EIS	environmental impact statement
27	EMF	electric and magnetic field
28	E.O.	Executive Order
29	EOR	enhanced oil recovery
30	EPA	U.S. Environmental Protection Agency
31	EPRI	Electric Power Research Institute
32	EQIP	Environmental Quality Incentives Program
33	ESA	Endangered Species Act of 1973
34	EUB	Alberta Energy and Utilities Board
35		
36	FAA	Federal Aviation Administration
37	FLPMA	Federal Land Policy and Management Act of 1976
38	FONSI	Finding of No Significant Impact
39	FR	<i>Federal Register</i>
40	FTE	full-time equivalent
41	FY	fiscal year
42		
43	GCR	gas combustion retort
44	GHG	greenhouse gas
45	GIS	geographic information system
46	GPO	Government Printing Office

1	GSENM	Grand Staircase–Escalante National Monument
2		
3	HAP	hazardous air pollutant
4	HAZCOM	hazard communication
5	HFC	hydrofluorcarbon
6	HMA	Herd Management Area
7	HMMH	Harris Miller Miller & Hanson, Inc.
8		
9	I-70	Interstate 70
10	IARC	International Agency for Research on Cancer
11	ICP	in situ conversion process
12	IEC	International Electrochemical Commission
13	IPPC	Intergovernmental Panel on Climate Change
14	ISA	Instant Study Area
15	ISWS	Illinois State Water Survey
16	IUCNNR	International Union for Conservation of Nature and Natural Resources
17		
18	JMH CAP	Jack Morrow Hills Coordinated Activity Plan
19		
20	KOP	key observation point
21	KSLA	Known Sodium Leasing Area
22		
23	LAU	Lynx Analysis Unit
24	LETC	Laramie Energy Technology Center
25	LPG	liquefied petroleum gas
26	L _{dn}	day-night average sound level
27	L _{eq}	equivalent sound pressure level
28	LWC	lands having wilderness characteristics
29		
30	M&I	municipal and industrial
31	MFP	Management Framework Plan
32	MIS	modified in situ recovery
33	MLA	Mineral Leasing Act
34	MMC	Multi Minerals Corporation
35	MMTA	Mechanically Mineable Trona Area
36	MOU	Memorandum of Understanding
37	MPCA	Minnesota Pollution Control Agency
38	MSDS	Material Safety Data Sheet
39	MSHA	Mine Safety and Health Administration
40	MSL	mean sea level
41	MTR	military training route
42		
43	NAAQS	National Ambient Air Quality Standards
44	NADP	National Atmospheric Deposition Program
45	NAGPRA	Native American Graves Protection and Repatriation Act
46	NCA	National Conservation Area

Draft OSTs PEIS

1	NCDC	National Climate Data Center
2	NEC	National Electric Code
3	NEPA	National Environmental Policy Act of 1969
4	NHPA	National Historic Preservation Act of 1966
5	NFS	National Forest Service
6	NLCS	National Landscape Conservation System
7	NMFS	National Marine Fisheries Service
8	NNHP	Nevada Natural Heritage Program
9	NOI	Notice of Intent
10	NORM	naturally occurring radioactive materials
11	NOSR	Naval Oil Shale Reserves
12	NPDES	National Pollutant Discharge Elimination System
13	NPS	National Park Service
14	NRA	National Recreation Area
15	NRHP	<i>National Register of Historic Places</i>
16	NSC	National Safety Council
17	NSO	No Surface Occupancy
18	NWCC	National Wind Coordinating Committee
19		
20	OHV	off-highway vehicle
21	OOSI	Occidental Oil Shale, Inc.
22	OPEC	Organization of Petroleum Exporting Countries
23	OSEC	Oil Shale Exploration Company
24	OSEW/SPP	Oil Sands Expert Workgroup/Security and Prosperity Partnership
25	OSHA	Occupational Safety and Health Administration
26	OSTS	oil shale and tar sands
27	OTA	Office of Technology Assessment
28		
29	PA	Programmatic Agreement
30	PADD	Petroleum Administration for Defense District
31	PAH	polycyclic aromatic hydrocarbon
32	PCB	polychlorinated biphenyl
33	PEIS	programmatic environmental impact statement
34	PFC	perfluorocarbons
35	PFYC	Potential Fossil Yield Classification
36	P.L.	Public Law
37	PM	particulate matter
38	PM _{2.5}	particulate matter with an aerodynamic diameter of 2.5 µm or less
39	PM ₁₀	particulate matter with an aerodynamic diameter of 10 µm or less
40	PPE	personal protective equipment
41	PRLA	preference right lease area
42	PSD	Prevention of Significant Deterioration
43		
44	R&D	research and development
45	R&I	relevance and importance
46	RBOSC	Rio Blanco Oil Shale Company

1	RCRA	Resource Conservation and Recovery Act of 1976
2	RD&D	research, development, and demonstration
3	RF	radio frequency
4	RFDS	reasonably foreseeable development scenario
5	RMP	Resource Management Plan
6	ROD	Record of Decision
7	ROI	region of influence
8	ROS	Recreation Opportunity Spectrum
9	ROW	right-of-way
10		
11	SAGD	steam-assisted gravity drainage
12	SAMHSA	Substance Abuse and Mental Health Services Administration
13	SDWA	Safe Drinking Water Act of 1974
14	SFC	Synthetic Fuels Corporation
15	SHPO	State Historic Preservation Office(r)
16	SIP	State Implementation Plan
17	SMA	Special Management Area
18	SMP	suggested management practice
19	SPR	Strategic Petroleum Reserve
20	SRMA	Special Recreation Management Area
21	SSI	self-supplied industry
22	STSA	Special Tar Sand Area
23	SWCA	SWCA, Inc., Environmental Consultants
24	SWPPP	Stormwater Pollution Prevention Plan
25	SWWRC	States West Water Resources Corporation
26		
27	TDS	total dissolved solids
28	THAI	toe to head air injection
29	TIS	true in situ recovery
30	TL	timing limitation
31	TMDL	Total Maximum Daily Load
32	TOSCO	The Oil Shale Corporation
33	TSCA	Toxic Substances Control Act of 1976
34	TSDF	treatment, storage, and disposal facility
35		
36	UDEQ	Utah Department of Environmental Quality
37	UDNR	Utah Department of Natural Resources
38	UDWR	Utah Division of Wildlife Resources
39	UIC	underground injection control
40	USACE	U.S. Army Corps of Engineers
41	USC	<i>United States Code</i>
42	USDA	U.S. Department of Agriculture
43	USFS	U.S. Forest Service
44	USFWS	U.S. Fish and Wildlife Service
45	USGCRP	U.S. Global Change Research Program
46	USGS	U.S. Geological Survey

1	VCRS	Visual Contrast Rating System
2	VOC	volatile organic compound
3	VRI	visual resource inventory
4	VRM	Visual Resource Management
5		
6	WDEQ	Wyoming Department of Environmental Quality
7	WGFD	Wyoming Game and Fish Department
8	WRAP	Western Regional Air Partnership
9	WRCC	Western Regional Climate Center
10	WRI	World Resources Institute
11	WRSOC	White River Shale Oil Corporation
12	WSA	Wilderness Study Area
13	WSR	Wild and Scenic River
14	WTGS	wind turbine generator system
15	WYCRO	Wyoming Cultural Records Office

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CHEMICALS

CH ₄	methane	N ₂ O	nitrous oxides
CO	carbon monoxide	NO _x	nitrogen oxides
CO ₂	carbon dioxide	O ₃	ozone
CO _{2e}	carbon dioxide equivalent		
		Pb	lead
H ₂ S	hydrogen sulfide		
		SF ₆	sulfur hexafluoride
NH ₃	ammonia	SO ₂	sulfur dioxide
NO ₂	nitrogen dioxide	SO _x	sulfur oxides

UNITS OF MEASURE

1	ac-ft	acre foot (feet)	ft ³	cubic foot (feet)
2				
3	bbbl	barrel(s)	g	gram(s)
4	Btu	British thermal unit(s)	gal	gallon(s)
5			GJ	gigajoule(s)
6	°C	degree(s) Celsius	gpd	gallon(s) per day
7	cfs	cubic foot (feet) per second	gpm	gallon(s) per minute
8	cm	centimeter(s)	GW	gigawatt(s)
9			GWh	gigawatt hour(s)
10	dB	decibel(s)		
11	dB(A)	A-weighted decibel(s)	h	hour(s)
12			ha	hectare(s)
13	°F	degree(s) Fahrenheit	hp	horsepower
14	ft	foot (feet)	Hz	hertz

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1	in.	inch(es)	MMBtu	thousand Btu
2			mph	mile(s) per hour
3	K	degree(s) Kelvin	MW	megawatt(s)
4	kcal	kilocalorie(s)		
5	kg	kilogram(s)	ppb	part(s) per billion
6	km	kilometer(s)	ppm	part(s) per million
7	kPa	kilopascal(s)	ppmv	part(s) per million by volume
8	kV	kilovolt(s)	psi	pound(s) per square inch
9	kWh	kilowatt-hour(s)		
10			rpm	rotation(s) per minute
11	L	liter(s)		
12	lb	pound(s)	s	second(s)
13			scf	standard cubic foot (feet)
14	m	meter(s)		
15	m ²	square meter(s)	yd ²	square yard(s)
16	m ³	cubic meter(s)	yd ³	cubic yard(s)
17	mg	milligram(s)	yr	year(s)
18	mi	mile(s)		
19	mi ²	square mile(s)	µm	micrometer(s)
20	mm	millimeter(s)		

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ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS^a

The following table lists the appropriate equivalents for English and metric units.

Multiply	By	To Obtain
<i>English/Metric Equivalents</i>		
acres	0.4047	hectares (ha)
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)
<hr style="border-top: 1px dashed black;"/>		
<i>Metric/English Equivalents</i>		
centimeters (cm)	0.3937	inches (in.)
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)	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)

^a In general in this PEIS, only English units are presented. However, where reference sources provided both English and metric units, both values are presented in the order in which they are given in the source. Where reference sources provided only metric units, only those units are presented.

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