

Appendix L – Energy and Minerals

This appendix contains the following:

- Trends in salable mineral developments and proposed guidelines on salable mineral exploration and development activity
- Trends in locatable mineral developments and regulation for locatable mineral exploration and development activity
- Reasonably foreseeable leasable mineral developments and proposed stipulations on leasable mineral exploration and development activity
- Quarry management in special areas
- Rankings of prospective mineral occurrence or development ranking of each special area that is recommended for withdrawal from locatable mineral entry

Trends in Salable Mineral Developments and Guidelines

Table L-1 shows the estimated number of new quarries that could be developed or the existing sites that will require expansion for development per district over a 10-year period. Based on past BLM data, one-half acre per site was used as the estimated amount of land to be disturbed for either a new site or the expansion of an existing site. As Table L-1 shows, the BLM estimates that 37 quarry developments or expansions would utilize 18.5 acres of land in the next 10 years.

Table L-1. Salable mineral development ten-year scenario for new or expanded* quarry development. The BLM assumes 0.5 acres per quarry.

	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem	Totals
Number of quarries	7	4	2	9	6	9	37
Total (Acres)	3.5	2	1	4.5	3	4.5	18.5

* Expanded development beyond the existing quarry development footprint.

Salable Mineral Developments and Guidelines

Where practicable, the following requirements should be incorporated into quarry design and use of mineral material sites:

- BLM quarries will be designed to have slopes no steeper than 1.5 : 1, which is the current State of Oregon standard. Bench height should not exceed 40 feet and bench width should be at least 12 feet wide or wider if regularly used by earthmoving equipment.
- All topsoil shall be stockpiled or windrowed as appropriate, for use in reclamation. Where needed, stabilization and erosion control of overburden and stockpiles will be employed.
- Clearing of timber and brush should be planned at least 10 feet beyond the edge of the excavation limit.
- If applicable, the quarry floor should be designed with an out slope to provide for adequate drainage. Alternatively, often water can be managed through infiltration.
- The operator shall comply with Federal, local and state safety codes or regulations covering quarry operations, warning signs and traffic control. All necessary permits must be obtained from Federal, State, and local agencies.
- Use of the quarry site beyond that of the contract period will require authorization normally under a temporary use permit.
- Where reasonably practicable, based on the approved mining and reclamation plan, all material sites will be graded to conform with the surrounding topography prior to closure. Topsoil will be

utilized to create a medium for re-vegetation. Access roads no longer needed will be reclaimed. Other reclamation strategies include helicopter landing site, log landing, dispersed camp site, recreational shooting range, overburden waste sites for ditch cleanings or landslides, fire staging areas, helicopter ponds sites, hang gliding sites, raptor nesting (in rock walls of the quarry benches), or other post-quarry uses.

Trends in Locatable Mineral Development and Regulation

Tables L-2 and L-3 show the estimated number of notices and plans of operation that may be filed over the next ten years. The BLM used past data to estimate the number of proposals and the acres per operation. This data showed that the average plan of operation is about three acres and the average notice is about one-quarter of an acre. Based on the number of past submittals of mining proposals the BLM expects that 86 notices and 24 plans of operations will be submitted over a 10-year period (Table L-2). These notices will cover 21 acres, with the majority of the notices in the Medford district. Approximately 24 plans of operation will cover 72 acres, with the majority of the plans of operation in the Medford District (Table L-3). Notices or plans of operation will utilize 93 acres over the next 10 years in the decision area.

Table L-2. Locatable mineral development 10-year scenario notices of operation. The BLM assumes 0.25 acres per notice.

	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem	Totals
Number of notices	4	4	-	70	4	4	86
Total (Acres)	1	1	-	17	1	1	21

Table L-3. Locatable mineral development 10-year scenario plans of operation. The BLM assumes 3 acres per plan of operation.

	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem	Totals
Number of plans of operation	1	1	-	20	1	1	24
Total (Acres)	3	3	-	60	3	3	72

Mining is regulated by the *Surface Management Regulations* (43 CFR 3809) and *Use and Occupancy Under the Mining Laws* (43 CFR 3715). It is the responsibility of the mining claimant/operator to prevent “unnecessary or undue degradation,” perform all necessary reclamation work, and comply with relevant Federal and State regulations.

Operations ordinarily resulting in only negligible disturbance as defined in 43 CFR 3809.5 are considered to be casual use and no notification to the BLM is required. All activities exceeding casual use must file a notice or plan of operations.

Reasonably Foreseeable Leasable Mineral Developments and Proposed Restrictions

The Reasonably Foreseeable Mineral and Energy Developments from the 2008 RMP/EIS (Appendix Q pp. 564, 568-622) is incorporated by reference.

The BLM has completed a review in 2015 of the fluid mineral reasonably foreseeable development scenarios (RFDs) for the 2008 RMP/EIS. The intent of the review was to determine if the RFDs could be included into this EIS by reference. The review focused on whether the circumstances or research completed in the RFDs had substantially altered since 2008.

Discussions with Dr. Allan Niem, the author or co-author of the predominantly referenced materials in

this EIS, indicates that the geologic settings and interpreted petroleum plays and systems have not altered substantially. Dr. Niem’s work is focusing on detailing his original research. No substantial publications have been issued since 2008 that would alter the RFDs interpretations. There are no concerns in incorporating by reference the resource portion of the RFDs from the 2008 RMP/EIS.

Potential development scenarios of the Coos Basin Coalbed Natural Gas (CBNG) Play, as described in this EIS, were dependent upon industry interest and development, as well as natural gas prices, occurring in 2008. Between 2008 and the present, the gas prices have dropped more than 3-fold, the original company involved with the Coos Basin development has gone into receivership through bankruptcy, and the current holder of the Coos Basin developments is Westport Energy. Westport Energy has retained property interests, but intends to abandon permanently all but five wells, which are located in the shallow gases. The remaining five wells will be kept in long-term suspension (Bob Houston, Oregon Department of Geology and Mineral Industries, personal communication-multiple events, 2014 and 2015). Therefore, based on this information, the projected development scenarios described in 2008 were not accurate.

However, a change in development scenario of CBNG for this EIS is not likely warranted. Analysis of the projected infrastructure was completed, with resulting stipulations. Analysis does not guarantee development; any development less than the analysis do not create an exceedance of impact. There are a great many unknowns that may occur within the life of this DEIS and future RMP. Neither the geologic setting nor the mineral potential for CBNG has altered since 2008. The current operator is maintaining resource extraction capabilities for future development. That development could occur under many highly feasible circumstances. The first is the development of the natural gas export facility in Coos Bay. Such systems would increase the market value of the Coos Basin CBNG and provide an immediate connection to market. Secondly, there would possibly be an increase in the domestic value of natural gas. During the research of 2008, natural gas prices ranged up to \$15.00/MMcf at wellhead. It has since reached lows below \$3.00/MMcf. As historical prices did reach the high level at one time, it is plausible that the same level could be reached or exceeded, making development of the Coos Basin once more marketable. Based on this reasoning, especially the foreseeable development of the Coos Bay export facility within the life of the RMP, it is recommended that the development scenarios within the 2008 document be maintained and incorporated into this EIS by reference.

Proposed Stipulations on Leasable Mineral Exploration and Development Activity

The section titled Proposed Restrictions and Requirements on Mineral and Energy Exploration and Development Activity from the 2008 RMP/EIS (USDI BLM 2008, Appendix Q, pp. 623-631) is incorporated by reference.

The State Geologist and the Medford District Geologist reviewed the stipulations of the 2008 document and found them applicable.

The same special leasing stipulations as Recreation Sites from Appendix Q, p. 628 of the 2008 RMP/EIS shall be applied to the land use allocation of Recreation Management Areas.

The land use allocations of eligible Wild and Scenic River segments and lands managed for Wilderness Characteristics shall have the following stipulations:

No Surface Occupancy

Resource: eligible Wild and Scenic River segments and Lands managed for Wilderness Characteristics

Stipulation: Surface occupancy and use are prohibited within all eligible Wild and Scenic River segments and Lands managed for Wilderness Characteristics.

Objective: To protect eligible Wild and Scenic River segments and Lands managed for Wilderness Characteristics lands.

Exception: An exception to this stipulation may be granted by the Authorized Officer, if the operator submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

Modification: The boundaries of the stipulated area may be modified by the Authorized Officer, if the eligible Wild and Scenic River segments and Lands managed for Wilderness Characteristics boundaries are changed.

Waiver: This stipulation may be waived, if the Authorized Officer determines that the entire leasehold no longer contains eligible Wild and Scenic River segments and Lands managed for Wilderness Characteristics designations.

The stipulations will apply to all forms of leasable fluid minerals, including geothermal.

Quarry Management within Special Areas

This section includes a discussion of Lands managed for their Wilderness Characteristics, eligible Wild and Scenic River segments, Areas of Critical Environmental Concern, and Recreation Management Areas that have quarries within their boundaries.

When gathering data for this information, many of the BLM staff (geologists, realty specialists, and engineers) stated that even though the entire area is proposed for closure to salable mineral development, many of the districts prefer to keep some or all of the developed quarries open until the quarry is depleted. See the appropriate section of this RMP revision for which areas closed to salable mineral entry for each alternative. Eligible Wild and Scenic River segments, Lands managed for Wilderness Characteristics ACECs, and RMAs that have existing developed quarries within their boundaries are detailed in **Tables L-4 through L-7**.

Table L-4. Quarries located in Lands managed for Wilderness Characteristics (LWCs) by district/field office.

District/Field Office	LWC Name	Quarry Name
Medford	Burton-Ninemile	Burton Butte
		Negro Bend
		Unnamed
	Dakubetede	Anderson Butte
	Wild Rogue Addition	Fire Fly
		Kelsey Peak
		Marble Gap
		Mt. Ruben
		Mt. Ruben Road
		Serpeng Springs

Table L-5. Quarries located in eligible Wild and Scenic River segments by district/field office.

District/Field Office	Eligible Wild and Scenic River	Quarry Name
Coos Bay	South Fork Coquille River	Oregon State Highway Pit
		Old Diamond Pit
Medford	Cow Creek	Cow Creek Number C
		Russell Road
	Elk Valley Creek	Elk Valley Quarry
	Quines Creek	Quines Creek Quarry
Roseburg	Cow Creek	Cattle Creek
		Quarry
Salem	Luckiamute River	Pedee Quarry

Table L-6. Quarries located in Areas of Environmental Concern by district/field office.

District/Field Office	ACEC Name	Quarry Name
Coos Bay	Roman Nose	Roman Nose
Eugene	Low Elevation Headwaters of the McKenzie River	West Hagan
Medford	Dakubetede	Anderson Butte
	East Fork Whiskey Creek	Mt. Ruben
		Mt. Ruben Road
	Old Baldy	Old Baldy
Roseburg	China Ditch	Buck Fork Creek
		Quarry/28-4-13B

Table L-7. Quarries located in Recreation Management Areas (RMAs) by district/field office.

District/Field Office	RMA Name	Quarry Name
Eugene	Coburg Hiking Trail System	McGowan Creek
		Lake Creek
	Upper Lake Creek	Prairie Mt.
		Prairie Mtn.

Ranking of the Prospective Mineral Occurrence and/or Development of Each Special Area Recommended for Withdrawal from Locatable Mineral Entry

Tables L-8 through L-11 list the estimated prospective mineral occurrence and/or development ranking of each eligible Wild and Scenic River segments, lands managed for Wilderness Characteristics, ACEC, and RMA that is recommended for withdrawal from locatable mineral entry. Some proposals have multiple polygons; when this was the case, each polygon was analyzed separately and that is why some sites have multiple rankings. Chapter 3 contains information on which areas are proposed for a recommendation for withdrawal from mineral entry by each alternative.

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Table L-8. Ranking of each Lands managed for their Wilderness Characteristics that are recommended for withdrawal from locatable mineral entry. These withdrawals vary by alternative.

Lands Managed for Wilderness Characteristics	Ranking
Berry Creek	Low
Bull of the Woods-Opal Creek Add - Evans Mountain	High
Bull of the Woods-Opal Creek Add - Nasty Rock	High
Burton-Ninemile	High
Clackamas Wilderness Add - Memaloose Creek	Low
Clackamas Wilderness Add - South Fork Clackamas #1	Low
Clackamas Wilderness Add - South Fork Clackamas #2	Low
Dakubetede	High
Round Top Mountain	High
Salmon Huckleberry Add - Boulder Creek	Low
Salmon Huckleberry Add - Eagle River	Low
Salmon Huckleberry Add - Salmon River	Low
Table Rock Wilderness Add	Low
Wasson Creek	Low
Wellington Mountain	High
Whiskey Creek	High
Wild Rogue	High
Wild Rogue Additions	High

Table L-9. Ranking of each eligible Wild and Scenic River segment that is recommended for withdrawal from locatable mineral entry for all alternatives including the No Action alternative.

Eligible Wild and Scenic River Segment Name	Ranking
Alsea River	Low
Antelope Creek	Medium
Applegate River	High
Big Butte Creek (including South Fork Big Butte)	Medium
Cheney Creek	Medium
Clackamas River	Low
Cow Creek	High
Drift Creek	Low
Drift Creek Segment A and B	Low
Elk Valley Creek	High
Fall Creek - Eugene	Low
Fall Creek - Salem	Low/Low
Kilches River	Low
Lake Creek	Low
Left Fork Foots Creek	High
Little Applegate River	High
Little Luckiamute River	Medium
Little North Santiam River	High
Lobster Creek	Low
Lobster Creek Segment B	Low
McKenzie River	Low
Middle Santiam River	Low
Nehalem River	Low
Nelson Creek	Low

Eligible Wild and Scenic River Segment Name	Ranking
Nestucca River Segment B	Low
North Fork Clackamas River	Low
North Fork Gate Creek	Low
North Fork Siletz River	Low
North Fork Trask River	Low
North Santiam	Medium
Quines Creek	High
Riffle Creek	High
Rogue River	High
Sam’s Creek	High
Sandy River Segments A and B	Low
Siletz River	Low
Sixes River	High
South Fork Coos River	Low
South Fork Coquille River	High
South Fork Gate Creek	Low
South Fork Little Butte Creek	Low
South Fork Trask River	Low
South Umpqua River	High
South Yamhill River	Medium
Table Rock Fork Molalla River	Medium
Trask River	Low
Tualatin River	Low
Umpqua River	Medium
West Fork Illinois River	High
Willamette River	Low
Wilson River	Low
Yaquina River	Low

Table L-10. Ranking of each Area of Environmental Concern (ACEC) that is recommended for withdrawal from locatable mineral entry. These withdrawals vary by alternative.

ACEC Name	Ranking
Baker Cypress	Low
Bear Gulch	High
Beatty Creek	High
Beaver Creek	Low
Bobby Creek	Low
Brewer Spruce	Medium/High
Bumpheads	Low
Bushnell-Irwin Rocks	Low
Callahan Meadows	Medium
Camas Swale	Low
Cherry Creek	Low
China Wall	Low
Coburg Hills	Low
Cougar Mountain Yew Grove	Low
Crabtree Complex	Medium
Dakubetede	Medium/High

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ACEC Name	Ranking
Dorena Lake	Low
East Fork Whiskey Creek	High
Eight Dollar Mountain	Medium/High
Elk Creek	Low
Forest Peak	Low
Fox Hollow	Low
Grass Mountain	Low
Grassy Mountain	Low
Grayback Glades	Medium
Heceta Sand Dunes	Medium
High Peak - Moon Creek	Low
Holton Creek	Medium
Horse Rock Ridge	Low
Hult Marsh	Low
Hunter Creek Bog	High
Iron Creek	High
Little North Fork Wilson River	Medium
Little Sink	Low
Lost Prairie	Low/Low
Lower Scappoose Eagle	Low/Medium
Mary's Peak	Low/Medium
McCully Mountain	Low
McGowan Meadow	Low
Middle Santiam Terrace	Low
Mill Creek Ridge	Low
Mohawk	Low
Molalla Meadows	Low
Myrtle Island	Low
Nestucca River	Low
New River	Medium/High
North Bank	Low
North Fork Chetco	Medium
North Fork Coquille River	Low
North Fork Hunter Creek	Low/High
North Fork Silver Creek	High
North Myrtle Creek	Medium
North Santiam	Low
North Spit	Medium
Oak Basin Prairies	Low
Old Baldy	Low
Pickett Creek	Medium
Pipe Fork	Medium
Red Pond	Low
Reeves Creek	Medium
Rickreall Ridge	Low
Rocky Peak	Medium
Rough and Ready	Medium/High
Saddle Bag Mountain	Medium

ACEC Name	Ranking
Sandy River Gorge	Low
Silt Creek	Low
Snow Peak	Medium
Soosap Meadows	Low
Spencer Creek	Low
Surveyor	Low
Table Rocks	Low/Medium
Tater Hill	High
The Butte	Low
Tunnel Creek	Low
Upper Elk Meadows	Low
Upper Klamath River	Low/Medium
Upper Klamath River Addition	Low
Upper Rock Creek	Low
Upper Willamette Valley Margin	Low/Medium
Valley of the Giants	Low
Walker Flat	Low
Wassen Creek	Low
Waterloo	Low
West Fork Illinois River	Medium/High
White Rock Fen	Low
Wilhoit Springs	Medium
Willamette Valley Prairie Oak and Pine Area	Low
Williams Lake	Low
Woodcock Bog	Medium
Yainax Butte	Low
Yaquina Head	Low
Yellowstone Creek	High

Table L-11. Ranking of each Recreational Management Area that is recommended for withdrawal from locatable mineral entry. These recommendations vary by alternative.

Recreation Management Area Name	Ranking
Alder Glen Campground	Low
Armstrong Gulch Trailhead	Medium
Barlow Creek Trail and Trailhead	Low
Bastendorff Beach	Low
Bear Gulch Trailhead	Medium
Bolt Mountain Trail	Medium
Carpenter Bypass Mountain Bike Trail	Low
Carpenter Bypass Staging Area	Low
Cascade View OHV Complex	Low
Cathedral Hills Trails	Medium
Cedar Grove	Low
Clay Creek Recreation Site	Low
Clay Creek Trail	Low
Coos Head	Low
Crooked Creek OHV Staging Site	Low
Culp Creek Expansion Site	Low

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Recreation Management Area Name	Ranking
Culp Creek Trailhead	Low
Deer Creek Education/Interpretive Area	Medium
Dorena Dam Trail Access Site	Low
Dovre	Low
Eagles Rest Hiking/Biking Trail	Low
Edson Creek Campground	Low
Eight Dollar Mountain	High
Eight Dollar Mountain Interpretive Site	High
Elderberry Flat Campground	Medium
Elk Bend	Low
Elkhorn Creek WSR	Medium
Emerald Trail	Low
Esmond lake Trailhead and Trail	Low
Fan Creek	Low
Flores lake	Medium
Gold Nugget Waysides	High
Grizzly Peak	Medium
Hill Creek Trail	Low
Hill Creek Wayside	Low
Hult Equestrian Staging Area	Low
Hult Reservoir Non-Motorized Trail	Low
Hult Reservoir Recreation Area	Low
Hunter Creek Trail System	High
Ivors Wayside	Low
Jacksonville Woodlands Trails	High
Kenney Meadows Recreation Site	High
King Mountain Trail	High
Klamath River WSR	Low/Medium
Loon Lake Recreation Area	Low
Lost Creek Trails	Low
Lower Lake Creek Falls	Low
Martin Rapids Overlook	Low
McGowan Creek Environmental Education Area Trail	Low
McGowan Creek Environmental Education Area	Low
McKenzie River Campground	Low
McKercher Park (R&PP Lease)	Low
Mosby Creek Trailhead	Low
North Bank - Comstock Day Use Area	Low
North Bank Habitat Management Area	Low
North Bank- Western Trailhead	Low
North Bowl Campground	Low
North Spit Beach and Ponds Unit	Medium
North Umpqua Trail - Swiftwater	Low/Medium
North Umpqua Trail - Tioga	Low
North Umpqua Wild Scenic River Corridor	Low/Medium
Northwest Hills	Medium
Pacific Crest Trail (PCT) 1 and 2	Low
Park Creek Campground	Low

Recreation Management Area Name	Ranking
Provolt Seed Orchard	High
Rennie Boat landing	Low
Rocky Peak Trail	Medium
Rogue Wild and Scenic River	Medium/High
Rough and Ready Trail	Medium
Row River Trail	Low/Medium
Row River Trail Expansion	Low/Medium
Sandy Ridge Trailhead	Low
Sawmill Trail	Low
Sharps Creek Recreation Site	Medium
Shotgun Creek Recreation Site	Low
Shotgun Non-Motorized Trail System	Low
Shotgun OHV Trail System	Low
Silver Creek Boat and McKenzie River Watchable Wildlife Site	Low
Siuslaw Bend Campground	Low
Sixes River Campground	Medium
Smith Creek	Low
Smith River Falls Campground	Low
Sterling Mine Ditch Trail	High
Stick Beach	Medium
Storm Ranch	Medium
Table Rocks	Low/Medium
Taylor landing Recreation Site	Low
Three Bears- Hardy Creek	Low
Tyrrell Seed Orchard Interpretive Trail	Low
Upper lake Creek ERMA	Low
Vincent Creek Campground	Low
Whitewater Day Use Area	Low
Whittaker Creek Recreation Area	Low
Whittaker Creek Trail	Low
Wild Rogue Canyon	Low/Medium/High
Wilhoit Springs	Medium
Willamalane Non-Motorized Trails	Low
Willamette River Greenway (R&PP lease)	Low
Wolf Creek Environmental Education Site and Trail	Low
Wolf Creek Falls Trail	Low

References

USDI BLM. 2008. Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management Districts. Bureau of Land Management, Oregon State Office, Portland, OR.

