
2.7 Land Use

2.7.1 Study Area

The cumulative effects study area for land use includes the following six subwatersheds in portions of Sheridan, Johnson, Campbell, and Converse counties: Antelope Creek, Dry Fork Cheyenne River, Little Powder River, Upper Belle Fourche River, Upper Cheyenne River, and Upper Powder River (**Figure 1-1**). It includes portions of the area administered by the BLM Buffalo and Casper field offices and portions of the TBNG, which is administered by the FS (**Figure 1-2**). Private lands comprise most of the surface ownership in the study area (**Figure 1-3**). The State of Wyoming also owns a portion of the area.

2.7.2 Cumulative Impacts

Based on the information in Appendices A and D of the Task 2 Report for the PRB Coal Review, Past and Present and Reasonably Foreseeable Actions (ENSR 2005c), a total of approximately 220,688 acres (5 percent) of land area have been disturbed by development activities in the study area as of the end of 2003. Of this total, approximately 68,794 acres of disturbance (31 percent of the total) were the result of activities associated with coal mining.

Of the total disturbance acreage, approximately 111,786 acres (51 percent) have been reclaimed. Reclamation of the remaining 108,901 acres of disturbance would occur concurrently with, or following the completion of, operations depending on the type of development activity. A coal mine, for example, would be reclaimed incrementally (with the exception of permanent facilities areas) as portions of the mine are completed. Oil and gas projects would be reclaimed following a project's or facility's completion. Disturbance from a power plant or other major industrial type project would continue for the life of the project. In general, reclamation would be guided by permit requirements, depending on the type of development activity. (Note: minor discrepancies in acreages are the result of rounding.)

Approximately 21,238 acres (31 percent) of the total 68,794 acres of disturbance associated with coal mine development have been reclaimed as of the end of 2003. Of the remaining 47,556 acres of disturbance, approximately 24,097 acres currently are not available for reclamation, as they are occupied by long-term facilities which are needed to conduct mining operations. These areas would be reclaimed near the end of the mine life. Reclamation of the remaining 23,459 acres, which represent areas of active mining and areas where coal has been recovered but reclamation has not been completed, would proceed concurrently with coal mining.

Potential effects of RFD activities on land use and recreation may be either short- or long-term in nature, although the time frames involved would not be consistent, varying with the type of development. The effects of a coal mine, for example, would be considered short-term as the use would change (most likely from rangeland or agriculture) to a mine, but would be reclaimed after the economically recoverable coal had been removed, at which time the land use would return to range or agriculture. In contrast, a power plant or an urban community development would be considered long-term as the change in use virtually would be permanent, lasting for the economic life of the activity, or longer. Even if a community becomes obsolete (ghost town scenarios are common in the

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natural resource driven history of the West), there often are no requirements or standards for reclamation of urban developments.

In essence, short-term effects would be those with a definite end date, even though it may be many years in the future and, usually, with requirements and standards for reclamation that would return the land to its original use or end the effect on recreation opportunities. Long-term effects would be those with a long and indeterminate life expectancy and, usually, no expectation of future reclamation.

The potential effects of projected RFD activities on land use and recreation opportunities in the study area under two (lower and upper) coal production scenarios are discussed below for the years 2010, 2015, and 2020. There would be no effects on Wild and Scenic Rivers as the only river segment identified as both “eligible” and “suitable” in the Task 1D Report of the PRB Coal Review, Current Environmental Conditions (ENSR 2005b) (the Middle Fork of the Powder River) is not in the cumulative effects study area.

2.7.2.1 Year 2010 – Lower Production Scenario

Land Use, Access, and Easements

Under the this scenario, past and projected development activities in the study area would result in a total disturbance of approximately 339,912 acres (approximately 7.6 percent of the study area) by 2010. Of the 339,912 acres, it is projected that 98,662 acres (29 percent) of the disturbance would be associated with coal mining activities. It is assumed that a substantial majority of the directly affected land use would be grazing land, with agricultural land disturbance following as a distant second. It is expected that this pattern would apply to both coal-related disturbance and total cumulative disturbance. In support of this assumption, the known, but undeveloped, coal reserves and both CBNG and conventional oil and gas development areas (which together represent a substantial majority of the total disturbance) largely would be located in grazing and agricultural areas.

Approximately 205,113 acres (60 percent) of the total 339,912 acres of disturbance would be reclaimed by 2010. The remaining 134,799 acres of disturbance would be reclaimed incrementally or following a project’s completion, depending on the type of development activity and permit requirements. A relatively small, but unquantifiable, portion of the total disturbance would remain disturbed over the long term. Of the 98,662 acres of disturbance associated with coal mine development, it is projected that approximately 44,938 acres (46 percent) would be reclaimed by 2010. Of the remaining 53,724 acres of coal mining-related disturbance, it is estimated that approximately 26,338 acres would be unavailable for concurrent reclamation due to the presence of long-term facilities which would be reclaimed near the end of each mine’s life. Reclamation of the remaining 27,386 acres of disturbance would proceed concurrently with mining operations.

A large, but unquantifiable, majority of the anticipated disturbance under this scenario would occur on split estates (privately owned surface lands with federally owned minerals). This would result in continued conflicts between surface users, which are mainly ranching interests, and minerals developers. There also may be conflicts with some dispersed rural residences, although specific locations cannot be identified at this time.

It is expected that there would be additional expansion of urban residential and commercial development as a result of the projected 25 percent growth in population (between 2003 and 2010) in the cumulative effects study area. (The population of Campbell County was used for this study as a proxy for the cumulative effects study area, as there are no significant population centers in other portions of the study area.) (See Task 3C Report of the PRB Coal Review, Social and Economic Effects [ENSR 2005f] for additional information on employment and population issues in the study area.) A majority of the new urban development would be expected to occur adjacent to existing communities, including primarily Gillette, which accounts for approximately 60 percent of the Campbell County population and, to a lesser extent, Wright and other small communities. Most of this development would occur on land that is currently in use for grazing or agriculture.

Mineral development would comply with state and federal laws and regulations, but would be exempt from local land use regulation as stipulated by state law.

Recreation

Few, if any, of the developed recreation sites in the cumulative effects study area would be affected by RFD-related disturbance under this scenario. As most of the projected disturbance area would occur on privately owned surface land, the extent of effects on dispersed recreation activities largely would depend on whether the disturbance areas had been open to public or private lease hunting. It is projected that cumulative development activities, especially the dispersed development of CBNG and, to a lesser extent, conventional oil and gas, would tend to exacerbate the trend toward a reduction in private land available for public hunting, which has been observed by WGFD in recent years (Shorma 2005). A reduction in available private land for dispersed recreation would contrast with the anticipated increase in demand for recreational opportunities and would tend to push more recreationists toward public lands where the BLM has projected a 5 percent increase in use every 5 years (BLM 2001).

It is expected that the RFD activities also would tend to expand and exacerbate the qualitative degradation of the dispersed recreation experience, in general, and of the hunting experience, in particular, as reported by the WGFD (Jahnke 2005). As noted in the Task 1D Report of the PRB Coal Review, Current Environmental Conditions (ENSR 2005b), a reduction in land available for hunting also makes herd management more difficult for the WGFD and reduces its hunting derived revenues (Shorma 2005).

Approximately 205,113 acres (60 percent) of the cumulative total of 339,912 acres of disturbance would be reclaimed by 2010. The remaining 134,799 acres of disturbance would be reclaimed incrementally or following a project's completion, depending on the type of development activity and permit requirements. After coal and oil and gas related development activities have been completed, and reclamation has been accomplished, many of the adverse effects on dispersed recreation activities would be substantially reduced.

Recreation planning for the cumulative effects study area would be affected to the degree that assumptions used in previous planning efforts might no longer be valid. These assumptions, particularly regarding supply and demand considerations, should be revisited and updated as development proposals become more concrete.

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Wilderness and Roadless Areas

No direct effects on Wilderness or roadless areas would be expected from development of RFD projects under this scenario. There are no designated Wilderness areas in the cumulative effects study area and mineral development would not be permitted in the Fortification Creek Wilderness Study Area until and unless Congress acts to remove it from Wilderness consideration. (See the Task 3A Report for the PRB Coal Review, Air Quality Effects [ENSR 2005g] relative to potential visibility impacts in Wilderness areas.)

2.7.2.2 Year 2010 – Upper Production Scenario

Land Use, Access, and Easements

Potential land use effects resulting from RFD activities in the study area essentially would be the same as those described under the 2010 – Lower Production Scenario, except approximately 3,786 additional acres would be disturbed. Under this scenario, a total of approximately 343,698 acres (approximately 7.7 percent of the study area) would be disturbed by the year 2010. Of the 343,698 acres, it is projected that 102,448 acres (30 percent) would be associated with coal mining activities.

Of the 343,698 acres of total disturbance, approximately 206,946 (60 percent) would be reclaimed by 2010. The remaining 136,752 acres of disturbance would be reclaimed incrementally or following a project's completion, depending on the type of development activity and permit requirements. Approximately 46,771 acres (46 percent) of the coal mine-related disturbance would be reclaimed by 2010. Of the remaining 55,677 acres of coal mining-related disturbance, it is estimated that approximately 25,688 acres would be unavailable for concurrent reclamation due to the presence of long-term facilities which would be reclaimed near the end of each mine's life. Reclamation of the remaining 29,989 acres of disturbance would proceed concurrently with mining operations.

Under this scenario, the expected effects on land use in the cumulative effects study area would be the same as described under the 2010 – Lower Production Scenario, with the following exceptions. The cumulative disturbance area would be 1.1 percent larger, and the unreclaimed disturbance area would be 1.4 percent larger. Also, the projected population would be approximately 5 percent larger, which would result in a proportionately larger increase in the area for urban development uses.

Recreation

The effects of RFD activities in the study area on recreation resources and activities essentially would be the same as described under the 2010 – Lower Production Scenario, except the magnitude would be increased in approximate proportion to the 1.4 percent increase in unreclaimed acreage.

Wilderness and Roadless Areas

The effects on Wilderness and roadless areas under this scenario essentially would be the same as described under the 2010 – Lower Production Scenario. (See the Task 3A Report for the PRB Coal

Review, Air Quality Effects [ENSR 2005g] relative to potential visibility impacts in Wilderness areas.)

2.7.2.3 Year 2015 – Lower Production Scenario

Land Use, Access, and Easements

Potential effects on land use as a result of RFD activities in the study area would be similar to those described under the 2010 – Lower Production Scenario, except approximately 86,172 additional acres would be disturbed. Under this scenario, RFD activities in the cumulative effects study area are projected to result in the total disturbance of approximately 426,084 acres (approximately 9.5 percent of the study area) by the year 2015. Of the 426,084 acres, it is projected that 117,236 acres (27 percent) would occur as a result of coal mining activities.

Of the total disturbance area, approximately 286,614 acres would be reclaimed by 2015. The 139,472 acres remaining unreclaimed would be 3.5 percent greater than the unreclaimed area under the 2010 – Lower Production Scenario. This area would be reclaimed incrementally or following a project's completion, depending on the type of development activity and permit requirements. Of the 117,236 acres of disturbance associated with coal mine development, it is projected that approximately 61,188 acres (52 percent) would be reclaimed by 2015. Of the remaining 56,048 acres of coal mining-related disturbance, it is estimated that approximately 27,549 acres would be unavailable for concurrent reclamation due to the presence of long-term facilities which would be reclaimed near the end of each mine's life. Reclamation of the remaining 28,499 acres of disturbance would proceed concurrently with mining operations.

Under this scenario, the expected effects on land use in the study area would be the same as those described under the 2010 – Lower Production Scenario, except the total disturbance area would be 25 percent larger, and the unreclaimed disturbance area would be 3.5 percent larger. The acreage increases in total disturbance and, especially, unreclaimed disturbance areas would result in proportionately greater conflicts with existing land uses, which would be primarily grazing and agricultural uses. The study area population is projected to increase by 33 percent, or 7 percent greater than under the 2010 – Lower Production Scenario, which would result in an approximately comparable increase in the urban development area.

Recreation

The effects on recreation resources and activities as a result of RFD activities in the study area essentially would be the same as described under the 2010 – Lower Production Scenario, except the magnitude would be increased in approximate proportion to the 3.5 percent increase in unreclaimed acreage.

Wilderness and Roadless Areas

The effects on Wilderness and roadless areas under this scenario essentially would be the same as described under the 2010 – Lower Production Scenario. (See the Task 3A Report for the PRB Coal Review, Air Quality Effects [ENSR 2005g] relative to potential visibility impacts in Wilderness areas.)

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2.7.2.4 Year 2015 – Upper Production Scenario

Land Use, Access, and Easements

Under this scenario, potential effects on land use from RFD activities essentially would be the same as those described under the 2010 – Lower Production Scenario, except they would be of greater magnitude commensurate with approximately 93,480 acres of additional disturbance. Under this scenario, RFD activities in the study area are projected to result in a total disturbance of approximately 433,392 acres (approximately 9.6 percent of the study area) by the year 2015. Sixty-seven percent of the total disturbance, or approximately 290,822 acres, would be reclaimed by 2015. The remaining 142,570 acres of disturbance would be reclaimed incrementally or following a project's completion, depending on the type of development activity and permit requirements.

Approximately 124,545 acres (29 percent) of the disturbance would be associated with coal mining activities, of which 65,396 acres (53 percent) would be reclaimed by 2015. Of the remaining 59,149 acres of coal mining-related disturbance, it is estimated that approximately 27,009 acres would be unavailable for concurrent reclamation due to the presence of long-term facilities which would be reclaimed near the end of each mine's life. Reclamation of the remaining 32,140 acres of disturbance would proceed concurrently with mining operations.

Under this scenario, the expected effects on land use in the study area would be the same as those described under the 2010 – Lower Production Scenario, except the total disturbance area would be 27 percent larger, and the unreclaimed disturbance area would be 5.8 percent larger. The increases in total disturbance and, especially, unreclaimed disturbance area would result in proportionately greater conflicts with existing land uses, which would be primarily grazing and agricultural uses. The projected population would be approximately 12 percent larger than under the 2010 – Lower Production Scenario, which would result in an approximately proportional increase in the urban development area.

Recreation

The effects on recreation resources and activities under this scenario essentially would be the same as described above for the 2010 – Lower Production Scenario, except that the magnitude would increase in approximate proportion to the 5.8 percent increase in unreclaimed acreage.

Wilderness and Roadless Areas

The effects on Wilderness and roadless areas under this scenario essentially would be the same as described under the 2010 – Lower Production Scenario. (See the Task 3A Report for the PRB Coal Review, Air Quality Effects [ENSR 2005g] relative to potential visibility impacts in Wilderness areas.)

2.7.2.5 Year 2020 – Lower Production Scenario

Land Use, Access, and Easements

Potential land use effects from RFD activities in the study area would be similar to those described under the 2010 – Lower Production Scenario, except a total of approximately 503,085 acres (or

approximately 11.2 percent of the study area) would be disturbed. This would be an increase of 163,173 acres, or 48 percent higher than the disturbance under the 2010 – Lower Production Scenario. It is projected that 137,443 acres (27 percent of the total) would be associated with coal mining activities.

Approximately 367,999 acres (73 percent of the total disturbance) would be reclaimed by 2020, leaving 135,085 acres of unreclaimed disturbance. The unreclaimed area would be 0.2 percent greater than under in 2010 – Lower Production Scenario. The unreclaimed areas would be reclaimed incrementally or following a project's completion, depending on the type of development activity and permit requirements. A projected 57,979 acres (42 percent) of the coal mining-related disturbance would remain unreclaimed under the 2020 – Lower Production Scenario. Of this acreage, it is estimated that approximately 28,797 acres would be unavailable for concurrent reclamation due to the presence of long-term facilities which would be reclaimed near the end of each mine's life. Reclamation of the remaining 29,182 acres of disturbance would proceed concurrently with mining operations.

Under this scenario, the expected effects on land use in the cumulative effects study area would be the same as described under the 2010 – Lower Production Scenario, except the cumulative disturbance area would be 48 percent larger, and the unreclaimed disturbance area would be 0.2 percent larger. The increases in total disturbance and, especially, unreclaimed disturbance areas would result in proportionately greater conflicts with existing land uses, which would be primarily grazing and agricultural uses. The projected population would be approximately 13 percent higher than under the 2010 – Lower Production Scenario, which would result in a proportional increase in the urban development area.

Recreation

Under this scenario, the effects on recreation resources and activities essentially would be the same as described under the 2010 – Lower Production Scenario, except the magnitude would increase in approximate proportion to the 0.2 percent increase in unreclaimed acreage.

Wilderness and Roadless Areas

The effects on Wilderness and roadless areas under this scenario essentially would be the same as described under the 2010 – Lower Production Scenario. (See the Task 3A Report for the PRB Coal Review, Air Quality Effects [ENSR 2005g] relative to potential visibility impacts in Wilderness areas.)

2.7.2.6 Year 2020 – Upper Production Scenario

Land Use, Access, and Easements

Under this scenario, RFD activities in the study area are projected to disturb a total of approximately 514,732 acres (approximately 11.5 percent of the study area) by 2020. A projected 149,089 acres (29 percent of the disturbance) would result from coal mining activities.

Potential impacts to land use as a result of RFD activities would be similar those described under the 2010 – Lower Production Scenario, except approximately 174,820 additional acres would be

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disturbed. Approximately 73 percent of the total disturbance (374,732 acres) would be reclaimed by 2020, and the unreclaimed acreage would be 139,998 acres, or approximately 3.8 percent greater than the unreclaimed acreage under the 2010 – Lower Production Scenario. The unreclaimed acreage is the area most likely to conflict with existing land uses in the study area.

It is projected that approximately 86,196 acres of the coal mining-related disturbance (58 percent) would be reclaimed by 2020. Of the remaining 62,890 acres of coal mine-related disturbance, it is estimated that approximately 28,345 acres would be unavailable for concurrent reclamation due to the presence of long-term facilities which would be reclaimed near the end of each mine's life. Reclamation of the remaining 34,545 acres of disturbance would proceed concurrently with mining operations.

Under this scenario, the expected effects on land use in the study area would be of the same type as described under the 2010 – Lower Production Scenario, except the cumulative disturbance area would be 51 percent larger, and the unreclaimed disturbance area would be 3.8 percent larger, leading to a substantially greater potential for conflict with existing uses. The increases in total disturbance and, especially, unreclaimed disturbance areas would result in proportionately greater conflicts with existing land uses, which would be primarily grazing and agricultural uses. The projected population would be approximately 19 percent greater than under the 2010 – Lower Production Scenario, which would result in a proportionate increase in the urban development area.

Recreation

Under this scenario, the effects on recreation resources and activities as a result of RFD activities in the study area essentially would be the same as described under the 2010 – Lower Production Scenario, except the magnitude would increase in approximate proportion to the 3.8 percent increase in unreclaimed acreage.

Wilderness and Roadless Areas

The effects on Wilderness and roadless areas under this scenario essentially would be the same as described under the 2010 – Lower Production Scenario. (See the Task 3A Report for the PRB Coal Review, Air Quality Effects [ENSR 2005g] relative to potential visibility impacts in Wilderness areas.)