



ENVIRONMENTAL CONSEQUENCES 4

This chapter analyzes the environmental impacts of the management decisions for the proposed plan and alternatives presented in Chapter 2. Since the alternatives describe overall management emphasis, and do not necessarily propose specific, on-the-ground-projects or actions, the environmental consequences of the decisions are often expressed in comparative, general terms. In most cases, subsequent analysis will be required to implement resource management decisions. More detailed or site-specific studies and appropriate environmental documents will be prepared in compliance with the National Environmental Policy Act and its implementing regulations as the need arises.

Impacts described include analysis of the direct, indirect, and cumulative impacts of the proposed plan and alternative actions. Only significant changes or impacts are discussed. If there is no discussion on a particular program or resource, it may be inferred there are no significant changes or impacts to that program or resource.

Cumulative impacts are described following the resource/program-specific direct and indirect impact discussions for the proposed plan and each alternative. Cumulative impacts are defined as additional and interactive combinations of activities that are not necessarily individually qualitatively different, but together require different management techniques and applications. Cumulative impacts occur when there are multiple infringements on the same values. The incremental impacts of the management objectives in the proposed plan and each of the alternatives presented, when combined with past, present, and future actions, have been considered in the preparation of this RMP.

Irreversible and irretrievable commitments of resources and short-term uses versus long-term productivity are described, if applicable. Immediate impacts are those occurring during the construction or start-up phase of a project. Short-term impacts occur after the project is in

place and may continue for a period of five years. Long-term impacts can occur up to fifteen years, or longer, after the project is in place.

Mitigating measures designed to avoid or reduce the environmental impacts were incorporated into the various management actions. Impacts identified in this chapter are considered unavoidable net effects.

ASSUMPTIONS

This section sets forth the factors necessary to guide the impact analysis. The assumptions provide a reasonable prediction of how key factors which would effect the impacts may change over time, such as change in demand for oil and gas. It also describes the standard procedures which are required in carrying out the resource management decisions. Nothing in these assumptions should be interpreted as constraining or redefining the management actions proposed for each alternative as described in Chapter 2. These assumptions were developed for impact analysis purposes only.

The interdisciplinary team agreed to reasonable project assumptions that could be used as a basis for analyzing impacts from the resource management alternatives. These assumptions were used to arrive at a cumulative impact for each environmental element.

Committed mitigation measures are all those stipulations, restrictions, and requirements imposed on activities on the public lands to protect environmental, socioeconomic, or other resource values. They are the mitigation measures BLM is committed to enforce in managing the public lands and are therefore assumed for purposes of the RMP. All applicable laws and their implementing regulations are assumed as committed mitigation. The committed mitigation measures are identified under "Management Guidance Common to the Proposed Plan and All Alternatives" at the beginning of Chapter 2. Where

these measures differ between the proposed plan and alternatives, as management practices to be implemented for a particular alternative, they are identified in Chapter 2.

AIR QUALITY MANAGEMENT

Air quality has the potential to be affected by dust or smoke from surface-disturbing activities associated with mineral exploration and development, lands and realty actions, livestock management activities, OHV uses, recreation, wildlife habitat development, and fire control efforts under each alternative. However, any of these activities would occur within the acceptable air quality ranges as defined by current laws.

Implementation of BLM activities and BLM permitted activities is controlled through stipulations and/or conditions of approval and monitoring so they comply with applicable federal and state standards for air quality. Although violations through accidental occurrences or noncompliance with BLM stipulations may occur, it is assumed the probability of their occurrence and magnitude is low enough that they are projected to be well within acceptable limits.

CULTURAL AND PALEONTOLOGICAL RESOURCES

Based on current trends it is assumed public use of cultural and paleontological resources will continue and in certain areas increase. This will take the form of increased tourism, approved research field studies, and recreational interpretation. Such use is an integral part of the local governments' and the State of Utah's tourism plan.

It is assumed that illegal activities such as vandalism and illegal collection, will continue to increase as public attention to these resource values increase.

FISH AND WILDLIFE HABITAT MANAGEMENT

It is assumed that the demand for wildlife habitat (consumptive and non-consumptive) will increase on public lands as private lands are developed and associated wildlife habitat altered.

As public demand increases in the future to utilize big game, the relative importance of big game crucial winter ranges in maintaining populations at objective levels will increase. Loss of crucial winter range would result in a proportionate reduction in big game populations.

Monitoring would gather sufficient information to recommend changes in carrying capacity. Implementing these adjustments would resolve present wildlife/livestock conflicts.

Big game numbers would be managed by the State of Utah's Board of Big Game Control to meet their stocking in each alternative.

The condition of vegetation and soils directly affects wildlife population levels. Any change in these two environmental components correspondingly affects wildlife populations. Deer populations, for example, tend to increase during periods of high browse availability and decline when forage is scarce.

The wording of the proposed decision regarding black-footed ferrets makes analysis difficult. Therefore, the potential reintroduction site of Eight Mile Flat will be used for the purpose of analysis only. Such an analysis would cover the largest reintroduction area (16,600 acres), combined with a high potential oil and gas region, providing adequate analysis on which to make a decision. It is assumed that impacts realized, should one of the other four potential reintroduction sites be ultimately selected, would be less than those presented for the Eight Mile Flat area.

HAZARDOUS MATERIALS MANAGEMENT

No hazardous material disposal sites would be permitted on public lands in the resource area. Any unauthorized disposal sites would be cleaned up and hazardous materials removed to an approved disposal area. All BLM activities and BLM-permitted activities would be controlled through stipulations and monitoring to insure the BLM hazardous material management policy was implemented.

LANDS AND REALTY MANAGEMENT

Land disposal actions are generally initiated by the State, counties, and the public on an infrequent basis. No substantial needs were identified for future projects and therefore, it can be assumed that land disposals through sale and patent would be minimal. It is expected that disposal actions would involve an average of 50 acres per year.

It can be expected that the amount of acreage involved in exchanges in the past will increase due to the Bureau's emphasis on acquiring lands to reinforce and facilitate the management objectives identified in the approved RMP.

A total of 60 land use authorizations were issued within DMRA during the last three years (1990-1992)

encompassing approximately 2,192 acres. Based on these statistics, it could be expected that approximately 25 applications would be received per year, affecting up to 800 acres. Approximately half of these would be in support of mineral exploration and development within DMRA. Should the demand for mineral development increase throughout the life of the plan, the number of use authorizations associated with mineral development would also increase.



LIVESTOCK MANAGEMENT

Grazing would continue to be permitted in the resource area based on demand and identified resource values. The demand for livestock forage on public lands in the Diamond Mountain Resource Area is directly related to forage availability, fluctuations in the livestock market, and capabilities of feeding livestock during the year when not on public lands.

More recent demands for leaner red meat may affect the use of feedlots, increasing the demand for rangeland forage by yearling cattle operations. The long-range demand for sheep rangeland forage is expected to remain fairly static (Drabenstott and Duncan, 1982; National Cattleman's Association, 1982). Recently, per capita consumption of sheep-related products has been decreasing and the sheep market has been depressed. It is reasonable to assume a tendency for livestock operators to convert from sheep to cattle operations if the sheep market continues to decline. Both the sheep and cattle industries appear to have reached maturity in the west. There is little indication of prospects for significant expansion (Field, 1991).

During the last six years in DMRA, total average actual use has been approximately 74 percent of active preference or authorized use. This partially reflects temporary reductions in use due to drought in 1988, 1989, and 1990. Future grazing adjustments would be made if a need was revealed by monitoring. BLM would coordinate and consult with livestock operators and, where necessary, with other interested groups before making any adjustments.

The principal environmental components directly affected by livestock grazing are vegetation and soils. Any change

in vegetation and soils would affect livestock grazing as well as other resources.

MINERALS RESOURCE MANAGEMENT - LEASABLE

Oil and Gas

Oil and gas development will be authorized within the resource area based on demand and restricted by measures designed to protect identified resource values.

GENERAL ASSUMPTIONS. The general assumptions as listed below were derived through an analysis of over 750 oil and gas exploration or development wells in DMRA. The detailed analysis and the development of a reasonable foreseeable development for oil and gas exploration and development over the life of the plan is discussed thoroughly in Appendix 4.

Based on the detailed analysis as outlined in Appendix 4, the following general assumptions may be made for oil and gas exploration and development over the life of this RMP.

- The exploration for and development of oil and gas resources will continue to occur in an orderly manner on BLM lands.
- Well spacing programs for oil or gas exploration or development wells in DMRA may be either: one which conforms with a spacing order or field rule issued by the State of Utah's Board of Oil, Gas and Mining, and accepted by BLM; or one which is located on a lease committed to a communitized or unitized tract at a location approved by BLM. In the absence of special orders established drilling units, well spacing is set at 40 acres per well. Although the federal government is not bound by these spacing orders, they are generally recognized. Spacing within each of the regions varies and is discussed in Appendix 4, "Reasonable Foreseeable Development".
- Surface disturbance associated with the drilling and development of oil and gas wells would occur with the construction of the following: access roads, drilling pad, oil and gas production facilities, and pipelines. The surface disturbance associated with the construction of the drilling pads and circulation pits for each location is estimated to be 2 acres. Access roads constructed to the drilling pad would vary in length, but would be 30 feet wide. Road

disturbance would vary in disturbance from 2-4 acres for each location. Oil and gas facilities are usually located on the well site (drilling pad) and do not require additional surface disturbance. However, off site oil and gas facilities, such as tank batteries, could disturb 2-6 acres. Pipelines may occur above ground or below ground and may involve 1-2 acres of disturbance if placed outside the access road. The placement of these pipelines would emphasize human safety and environmental protection. For the purpose of analysis, five acres will be used as the standard surface-disturbance associated with one well site development.

- The average life expectancy of an average oil well is between 5 and 20 years for primary recovery. Should secondary recovery methods be employed, additional wells may be required for the injection of water or carbon dioxide. Such secondary recovery methods may extend the life of the well an additional 5-20 years. Because the recovery for a typical gas well in the resource area is 80-95 percent, secondary methods are generally not employed.
- In general, oil exploration and development would continue to occur predominantly in the Myton Bench-Nine Mile region (refer to Map 3-13).
- In general, gas exploration and development would occur predominantly in the Horseshoe Bend-Ashley Valley region, however, gas exploration may increase in the Myton-Nine Mile region.
- It is assumed that at least one period of intense exploration and drilling development could occur in the resource area over the life of the plan.
- In general, geophysical exploration would occur primarily in the Myton-Nine Mile Canyon region and the Clay Basin-Manila region. Geophysical exploration would continue apace with the oil and gas development scenarios.
- It is assumed that the demand for domestic oil and gas would increase over the next 15 years. Also, it is assumed that the price of oil and gas would increase. It is assumed that new incentives would be continued by the federal government for more unconventional oil and gas resources (such as coal bed methane gas and tight gas sandstones). The amount of exploration and development for both conventional and unconventional oil and gas resources would vary

over the life of the plan with any change in the price of oil and gas, as well as, any change in the type and amount of incentives initiated by the federal government.

- It is assumed for the life of the plan that the price of oil will equal \$20 per barrel and the price of gas will equal \$1.50 per thousand cubic feet (MCFG).

REGIONAL ASSUMPTIONS. As previously mentioned, the Diamond Mountain Resource Area has been divided into five oil and gas exploration and development regions for analysis (refer to Map 3-13). The following assumptions are for oil and gas exploration and development in each region. These assumptions are in addition to the general assumptions.

Myton Bench-Nine Mile Canyon Region. The predominant exploration and development in the Myton Bench-Nine Mile Canyon region would be for oil occurring from the Green River Formation.

An average successful well drilled into the Green River Formation would be drilled to a depth of 6,000 feet and have an initial production of 106 barrels of oil per day (BOPD), 66 MCFPD (thousand cubic feet per day) of gas, and 26 barrels of water per day (BWPD). Based upon past spacing, wells would be drilled on 40-acre spacing units. The past success ratio (producing oil or gas wells/total number of wells drilled) in this region is 79 percent.

The primary exploration or development drilling would most likely take place adjacent to or within producing fields, such as Castle Peak, East Pleasant Valley, Eight Mile Flat-North, Island, Monument Butte, Pariette Bench, Pleasant Valley, River Bend and Treaty Boundary. Based upon past development, it is estimated that 15 oil exploration and development wells per year would be drilled in the region during the life of this RMP, for a total of 225 wells. Of the 225 wells, approximately 178 would be producing wells. Based upon past development, it was estimated that 11 gas exploration and development wells would be drilled during the life of the RMP. Of the 11, approximately 9 would be producing gas wells.

Exploration and development of unconventional resources, such as coal bed methane production from the Mesa Verde Group or tight gas sandstone production from the Wasatch and Mesa Verde Group could occur in this region. It is estimated that 20 wells would be drilled over the life of the plan with spacing set by Utah's Board of Oil, Gas, and Mining and the Bureau of Land Management.

The cumulative production per average well is assumed to be: 150,000 barrels of oil, and 650,000 MCF of gas.

Horseshoe Bend-Ashley Valley Region. The predominant exploration and development in the Horseshoe Bend-Ashley Valley region will be for oil occurring in the Green River and Weber Formations and gas from the Uinta Formation. A successful oil well drilled into the Green River Formation will be drilled to an average depth of 7,400 feet and have an initial production of 180 (BOPD), 56 MCFPD, and 25 BWPD. Based upon past spacing, wells would be drilled on either 320-acre spacing units (Lower Green River/Wasatch Formations) or 80-acre spacing units (Green River and transition zone between Green River and Wasatch Formations).

A successful gas well drilled into the Uinta Formation would be drilled to an average depth of 4,130 feet and have an initial production of 1,800 MCFPD of gas. Based upon past spacing, it would be drilled on 160-acre spacing units. The past success ratio (producing oil or gas wells/total number of wells drilled) in this region is 53 percent.

The primary oil exploration or development drilling would most likely take place within adjacent producing fields (such as Horseshoe Bend, Brennan Bottoms, and Gusher). Based upon past development drilling, it is estimated that ten wells per year would be drilled in the region over the life of the plan, for a total of 150 wells, 80 of which would be producing wells.

The primary gas exploration or development drilling would most likely take place adjacent to producing fields (such as Horseshoe Bend, Gusher, and Twelve Mile Wash fields). Based upon past development, it is estimated that approximately two wells per year would be drilled in the region over the life of the plan, for a total of 30 wells, 16 of which would be producing wells.

The cumulative production per average well is assumed to be: 500,000 barrels of oil, and 250,000 MCF of gas.

Diamond Mountain Plateau Region. The Diamond Mountain Plateau region is the least explored region and presently has no oil or gas production. It is assumed that oil exploration wells drilled in this region would be drilled for oil believed to occur in the Park City, Weber, or older formations. It is estimated that ten exploration wells would be drilled to an average depth of 3,100 feet over the life of the plan.

Clay Basin-Manila Region. The primary exploration and development drilling in the Clay Basin-Manila region would be for gas from the Frontier or Dakota Formations over the life of the plan.

A successful gas well drilled into the Frontier Formation would be drilled to an average depth of 5,780 feet and would have an initial production of 2,750 MCFPD of gas. Based upon past spacing, wells would be drilled on 40-acre spacing units.

A successful well drilled into the Dakota Formation would be drilled to an average depth of 6,310 feet and would have an initial production of 12,500 MCFPD of gas. Based upon past spacing, it would be drilled on 40-acre spacing units.

The past success ratio (producing oil or gas wells/total number of wells drilled) in this region is 51 percent.

The primary gas exploration or development drilling would take place adjacent to the Clay Basin gas field or along the thrust margin of the northern Uinta Mountains. Based upon past development, it is estimated that approximately one well per year would be drilled in the region over the life of the plan, for a total of 15 wells, 8 of which would be producing wells.

The cumulative production per average well is assumed to be: 30,000 barrels of oil, and 6,000,000 MCF of gas.

Indian Reservation Region. The predominant exploration and development in the Ute Indian Reservation region over the life of the plan would be for oil from the Lower Green River and Wasatch Formations. Exploration and development covered by this plan would be on split estate parcels only.

A successful oil well drilled on split estate parcels into the Lower Green River-Wasatch Formations would be drilled to an average depth of 15,000 feet and have an initial production of 800 BOPD, 640 MCFPD of gas, and 40 BWPD. Based upon past spacing, wells would be drilled on 640-acre spacing units. Based upon present spacing orders in each split estate parcel, a maximum of 83 wells could be drilled in this region, taking all parcels into consideration. However, it is estimated that 20 wells would be drilled in this region on these split estate parcels over the life of the plan.

"Gilsonite"

"Gilsonite" development would be authorized based on demand and limited by measures designed to protect significant resource values.

The potential for "Gilsonite" development in the western basin would increase as supplies diminish in the eastern basin. In the short-term, demand for "Gilsonite" would remain at current levels but may actually increase over

the life of the plan. From this it was assumed an eventual increase in "Gilsonite" prices. However, over the first five years of the plan, development on federal lands would remain confined to the eastern basin.

Exploration and development would initially occur on non-federal lands. However, with the passage of time and recovery of "Gilsonite" off non-federal lands, greater interest in federal lands would develop. Ultimately, exploration of federal lands would lead to the development of "Gilsonite" on some tracts within the resource area.

Activity on federal lands would be most intense in areas immediately surrounding known veins or vein systems. Exploration would be required to determine the true extent of "Gilsonite" deposits. It is also possible that BLM could classify lands and determine KLAs. Activity would concentrate most heavily in lands which extend outward from known veins. This is particularly true for lands along the trend line of veins. In general, the areas with the highest potential for "Gilsonite" occurrence may be found between the Green River, just south of Ouray, and the Pariette "Gilsonite" Mine, 25 miles to the northwest of Ouray.

It is reasonable to assume that should "Gilsonite" mining develop in DMRA during the life of the RMP, approximately 15 workers could be employed annually for the life of the project. Anticipated annual salaries would be approximately \$35,000 per employee.

Exploration would likely consist of truck or track-mounted rigs, drilling on a fairly tight hole spacing (as much as one hole per 1,320 feet of strike length), particularly where known deposits of "Gilsonite" have been identified. Total disturbance would amount to less than 40 acres each for most foreseeable projects. In most cases the need to develop roadways would be minimal. Exploration activities could be limited to one season with complete reclamation and revegetation actions completed at the close of that season for each exploration action.

Over the life of this plan, exploration activities in the resource area would increase with as many as 30 prospecting permit applications that could be filed.

It is generally known that the quality of "Gilsonite" deposits decrease significantly between the eastern and western basin. Veins tend to be smaller and the host rock surrounding them is less suitable for mining. However, improvements in technology and increased prices may allow developers to overcome these problems.

It is reasonable to expect that a handful of small mines would be developed over the life of the plan. Each could

remain active for 10 to 20 years. For each major vein, mine facilities would be located along the length of the vein, each separated by a distance of about 900 to 1,300 feet. In most instances, each site would consist of a head frame and related buildings, storage bins, hoists, and vehicles. A narrow roadway would connect each site.

The size of area disturbed in at each site would vary with time. Some sites would remain idle for long periods of time while others were active. Overall total disturbance, accounting for each site and connecting roadway, would amount to about 3.6 acres per mile of vein.

Surface impacts, resulting from mining itself, would be minimal. Mine design does not allow development of veins at the surface. Subsidence of the vein at the surface would not occur.

Oil Shale

Although deposits of relatively high grade oil shale do occur in the resource area, it is assumed that even with substantial increases in oil prices, these deposits would not be developed over the life of this plan. This is because richer and more thoroughly studied deposits occur in the Book Cliffs Resource Area, and in Piceance Creek Basin of Western Colorado. These would be more than sufficient to meet expected demand over the life of the plan.

Phosphate

Phosphate development would be authorized based on demand and limited by measures designed to protect significant resource values.

It is reasonable to expect that phosphate deposits in the Vernal Field will become more important within the life of the plan. It was assumed that eventually the value of phosphate would rise sufficiently to allow development on existing leases northeast of Vernal.

It is estimated that once a mine on these leases reaches full production, between 250 and 350 workers would be employed by the mine. Resulting wages to these employees would amount to over \$4 million annually. Employment will induce an additional 400 to 500 employees in other sectors of the economy, resulting in another \$4 to \$5 million in secondary income (Dames and Moore).

Development could be located on three lease tracts covering just over 7,650 acres. These lands include about 1,200 acres on the west side of Little Brush Creek,

just below the mouth of Little Brush Creek Gorge; and the remaining tracts extend eastward from Little Brush Creek to points just beyond the rim of Diamond Plateau above. Mining activities would be confined to the lands east of Brush Creek with supporting milling activities on private lands west of Brush Creek. Because of the amount of overburden, leases would likely be developed by underground room and pillar mining methods. Subsidence from mining is not anticipated.

The portal location for the mine would be located in Section 24, T.2 S., R.22 E. A mill would be located about 3/4 of a mile to the southwest in section 26.

Milling would utilize standard flotation techniques and the final product would be shipped from Vernal either by truck or possibly as a slurry in the existing Chevron slurry line to Rock Springs, Wyoming. Mill facilities would likely be in the SW 1/4 of Section 26, T.2 S., R.22 E. These would include: offices, warehouse, maintenance shops, compressor house, transformer station, parking. It is estimated that these would cover an area of about 3.5 acres.

An explosives magazine would be located in the stream valley located immediately north of the portal. Location and design of the magazine would include consideration for safety and security.

Initially about 750,000 tons of raw ore would be processed each year. After a few years, production would double to about 1.5 million tons. About 60 percent of production would become tailings after processing. These would be deposited within tailings ponds or be pumped back into the mine itself as back fill.

Three primary tailings pond sites have been identified. All three would be located in Sections 25 and 26, T.2 S., R. 22 E. Total area of the ponds would be about 130 acres. It is thought these three sites would provide enough storage to hold tailings for between 30 and 60 years, depending upon production rate. Sequential filling and reclamation would limit the area of disturbance to a single pond in active use at any given time.

Water requirements would include: an estimated 600 to 800 gallons per minute (gpm) for mining and another 300 to 600 gpm for milling. Additional water rights would be necessary to meet this requirement. Water consumption resulting from milling would result mostly from evaporative losses. Seepage from tailings ponds would be minimal. As much as is possible, all water used in milling would be recycled between the tailings ponds and the mill.

The generation of gaseous, liquid, and solid wastes would be minimal and would conform to state and federal requirements.

Access to the site would be provided by designated roadways generally along County Road 301, commonly referred to as the "Red Fleet Road". However, this county road would require some upgrading, primarily widening, improvement of the gravel surface, culverts, and drainage ditches. In addition, about 1.3 miles of haul road would be required to connect the mine portal and the mill site. Another two miles of roadway would be required to connect the mill with the adjacent tailings ponds.

Existing electrical power and gas lines would be tapped to support the site. Lines from the main line would enter the site from the west and would be roughly four miles in length.

Tar Sands

Tar sands development would be authorized based on demand and limited by measures assigned to protect significant resource values.

Large-scale development of tar sands, as major sources of refinery feedstock, will not be planned for in this document. The tar sand deposits in Utah, considered the most favorable for this sort of development, already have been considered in BLM's 1984 Combined Hydrocarbon Leasing EIS.

Although some relatively rich deposits do occur in the resource area, most notably the deposit along Asphalt Ridge, other larger and more easily developed tracts occur outside the resource area. Therefore, it is likely large scale tar sands development would occur outside of the resource area over the life of the plan, so there is no need to augment existing planning here.

Yet this does not rule out the potential for development of somewhat smaller tracts in the resource area designed for the extraction of bitumen as refinery feedstock. Accordingly, it was assumed that over the life of the plan, one such site would be developed along Asphalt Ridge. On federal lands, development would occur on existing mining claims, or on Combined Hydrocarbon leases or a combination of the two.

Development of such a site would occur over a period of 10 to 15 years. Mining would consist of stripping deposits of high grade tar sands at or near the surface. Because of this, mining would be most likely to occur on the east-facing toe slopes of Asphalt Ridge, between the

Bonanza Highway and the north end of Asphalt Ridge, immediately south of the LaPoint Highway.

At any given time during development, about 40 acres would be disturbed by processing facilities, vehicle storage, stock piles, and pit area. Reclamation of exhausted areas would take place as mining progressed into new areas. Total disturbance over the life of a site could be as much as 320 acres.

It was also assumed similar, although smaller, tracts would be developed in the Argyle Canyon, Pariette and Asphalt Ridge Special Tar Sand Areas (STSAs) for asphaltic paving materials. The manner of their development should be quite similar to the development of the Uintah County pit now on non-federal lands on Asphalt Ridge.

Over the life of the plan such site each in the Argyle Canyon, Pariette, and Asphalt Ridge STSAs could be expected. Development would occur on Combined Hydrocarbon Lease tracts or existing valid placer claims.

Potential development would include federal mineral lands all along the length of Asphalt Ridge. Near surface deposits on the southern end of the ridge would be the most attractive. At any given time, development could consist of an area of about 10 acres stripped back to accommodate mining. This area could remain open continuously but would periodically move laterally to allow development of new deposits. Reclamation would be concurrent with any such move. An additional area of about 10 to 20 acres could be utilized for stockpiles, topsoil stock piles, roads, offices, fuel, and vehicle storage.

Development of such sites would occur over a period lasting 15 years. As mentioned, reclamation would be conducted on an on-going basis. At the close of mining, the entire site would be reclaimed to federal standards. Over the next 15 years, it is assumed that both Duchesne and Uintah Counties will each begin to pave many of the more heavily used back-country roads currently surfaced with gravel only. These would include roads in Wells Draw, Nine Mile Canyon, Pleasant Valley, Pariette, and others. For this plan it is assumed that this would require as much as 100,000 to 200,000 tons of material per year.

Paving itself would offer additional benefits. It would decrease erosion and road maintenance leading to additional savings. Air quality would be significantly improved along more heavily used roadways. Finally, public enjoyment of the back-country would be improved.

Development north of Highway 40 would be unlikely over the life of the plan as the best deposits become difficult

due to topography and the position of the main oil bearing beds.

Development of asphalt pit sites in the Pariette STSA may be more likely. Duchesne County has expressed a keen interest in sites west of the Pariette Wetlands. Development scenarios of potential sites in the Pariette area could be essentially the same as the development on Asphalt Ridge described above.

Development of deposits in the Argyle Canyon STSA would eventually occur as increased traffic through Nine Mile Canyon and Argyle Canyon require improvement of roadways there. Again, development of a potential pit site would be the same as described for Asphalt Ridge above.

It was reasonable to assume exploration drilling would occur within the Argyle Canyon, Pariette, and the Asphalt Ridge STSAs. Exploration drilling will occur as a prelude to development of potential asphalt pits. During initial phases of drilling, hole spacing could be about 500 feet, and cover 10- to 40-acre tracts. Where drilling showed substantial values, drill hole spacing could tighten up to allow better delineation of deposits.

Additional disturbance could result from vehicle access to the drill holes. Drilling programs could be initiated and completed within the warm season. Reclamation could be completed at the end of a drilling season. It would include restoration of the land to its original contours and revegetation of disturbed lands.

MINERALS RESOURCE MANAGEMENT - LOCATABLE

Locatable minerals occurrence in the resource area is not significant. This plan assumes no new discoveries will change this view over the life of the plan. Locatable minerals would be developed in the resource area subject to demand and controlled by measures designed to protect significant resource values identified in the vicinity.

Relatively small occurrences of locatable minerals do occur in the resource area and these would continue to attract small-scale prospecting and development. Three areas would continue to attract public interest. These are the Precambrian rocks north of Browns Park, the alluvial deposits along the Green River, the Paleozoic limestone outcrops on the southern half of Diamond Mountain Plateau, and, pre-1920 tar sand claims along Asphalt Ridge.

Activities in the mountains north of Browns Park would be modest in both size and duration. Five notices of intent for operations disturbing five acres or less may be

submitted over the life of the plan this area. Typically these would be for small exploration or prospecting operations. Disturbances of one acre or less would be expected for each notice. Mineral values removed would not be significant.

A similar outlook may be expected for sites on the Paleozoic limestones on Diamond Mountain Plateau. However, most activity in this area would occur much further to the west, outside of the resource area.

New techniques and processes now being developed would allow enhanced recovery of fine gold from alluvial placer deposits at Horseshoe Bend on the Green River. This, coupled with potentially high gold prices, would amplify the relatively high interest in sites along the Green River. This is particularly true of sites in and around Horseshoe Bend.

Federal lands in the Horseshoe Bend area would attract a number of operations if this were not precluded by the effect of the oil shale withdrawal now in place. Development would clearly follow a lifting of the withdrawal. Subsequently, it is likely that up to two or three Mining Plans of Operation or notices could be submitted per year.

Typically, operations conducted under these plans would cover relatively large areas between 10 and 30 acres at a time. At any given time, an area of one to two acres would be stripped of overburden to provide raw materials for processing. An additional two to three acres would provide space for processing equipment, access ways and stockpiles. Settling ponds could cover as much as another one to two acres. It is anticipated that no operation would require more than 50 gallons of water per minute. If water were necessary to a given operation, water rights would be acquired. Where possible, abandoned areas would be reclaimed as operations progressed but some areas would remain disturbed for the life of the operation. An operation on 40 acres may remain active for as much as five years.

MINERALS RESOURCE MANAGEMENT - MINERAL MATERIALS

Mineral materials development would be authorized based on demand and restricted by measures developed to protect significant resource values.

It was assumed federal, state, county governments and other non-profit organizations would continue to depend upon free-use access to mineral materials in order to provide essential services to the community at the lowest possible cost. This would be especially true of the county

governments, who would continue to depend upon the BLM for free use materials for road maintenance in remote areas.

Over the life of the plan numerous free-use sites would be developed to meet these continuing demands. In addition, there would be occasional demand for negotiated sales and competitive sales for mineral materials. Generally this would most likely include sites in the Vernal area; summarized in Table 4-1. For planning, it is assumed that mineral material production from county free-use sites will amount to about 50,000 to 100,000 tons per year for sites throughout the resource area. This includes all grades of material with an approximate aggregate value of \$0.20 per ton or \$10,000 to \$20,000 per year. These materials take on additional value in those instances where federal lands offer the only viable source for mineral materials.

Typical development sites would cover about five to ten acres and remain open from five to ten years. At any given time, about one acre of each site would be stripped of existing vegetation and topsoil to provide access to materials. Another acre would remain disturbed as the result of access roads, stockpiles and processing equipment. To the degree possible, sites would be reclaimed on an on-going basis with restoration of exhausted areas as pits move.



**TABLE 4-1:
POTENTIAL MINERAL MATERIAL SITES WITHIN
THE DIAMOND MOUNTAIN RESOURCE AREA**

AREA	NO. OF SITES	POTENTIAL ACRES DISTURBED	COMMENTS
Clay Basin	2	10	North Flank of Goslin Mountain. Potential source of rip-rap. Alluvial deposits in eastern Clay Basin include well sorted gravels suitable for road base.
Browns Park	3	15	Potential deposits occur in a number of locations. These include gravel deposits in the modern flood plain of the green river, elevated terraces, and on benches along the outer edges of the valley floor.
Diamond Mountain	4	20	Nearly all of the exposures of Bishop Conglomerate on the plateau and outcrops of limestone along the north rim of Diamond Gulch are suitable sources of low grade quarry stone.
Donkey Flat	2	10	Deposits on Donkey Flat, around the toe slopes of the Buckskin Hills, and south to Sunshine Bench offer highly desirable deposits of gravels.
Ashley Valley	2	10	Deposits as described above also occur throughout Ashley Valley.
LaPoint Pariette Ouray	2 3 2	10 60 40	Outward across the badlands between Little Mountain and LaPoint. West-facing slopes of Asphalt Ridge to Little Mountain. Among others, development would include the reopening of previously developed sites. Located between Vernal and LaPoint in Sec. 33, T.4 S., R.20 E. A second potential site is located west of the Green River, just west of Horseshoe Bend. Sec. 30, T.6 S., R.21 E.
Nine Mile Draw	1 3	10 60	Gravel deposits tend to be found only in the bottom of Wells Draw existing drainages. These tend to occur as discontinuous and relatively rare deposits adjacent to the existing flood plain.
TOTALS	24	235	

On occasion, sites would require a limited amount of exploration prior to development. This would allow potential permittees the opportunity to assess the viability of a potential deposit. Disturbance resulting from these activities would be minimal and short term. In most cases exploration would consist of the excavation of test holes by backhoe. This would not require the construction of roads and would not involve support facilities. Typically, total disturbance would amount to less than one acre.

Demand for building stone throughout the area would increase while available supplies of stone in the Wrinkles Road Building Stone Area continue to decrease. Additional access to new areas within the building stone

area would provide additional sources of materials. This would result in about 10 miles of new road in the area, causing 35 to 40 acres of additional disturbance. Disturbance resulting from the collection of stone would remain minimal. The new roads would extend southward from the Wrinkles Road. These would open new areas extending southward over the rim of Nine Mile Canyon. Short spurs from these roads would extend to the rim to allow access to flagstone. In some cases these roads would lead downward to lower benches allowing collection on the south-facing slopes between these benches and Cowboy Bench above.

Public demand for blow sand in the Vernal area would continue. Without access to a convenient and economical supply trespass removal of blow sand in the Spring Creek area would continue. A single 20-acre community pit, open at any given time, would meet public need for this type of material. Areas with the best potential would be located north of Vernal near Taylor Mountain Road, adjacent to outcrops of the Navajo Sandstone. These areas are listed in Table 4-2.

Public access to the area would be controlled in order to limit the extent of surface disturbance to about two to three acres at any given time. Periodically, the BLM would reclaim exhausted areas of a site and alter access to the area to encourage development in new areas. This area would remain open for the life of the plan.

RECREATION MANAGEMENT

Recreation use in Browns Park SRMA would continue to increase between 10 and 15 percent each year for the foreseeable future. Throughout the remainder of the resource area it would increase between three and five percent annually.

There would be more demand for primitive forms of recreation such as hiking, backpacking, bicycling, and driving for pleasure. Bureau funding would be available

Increasing recreation use of the river corridor between Little Hole and the Utah-Colorado state line would require limiting some activities to meet human health and safety standards. Camping along the river could be limited to designated camp sites on a reservation basis. The use of fire pans and containers for human waste would be required, where necessary, to protect the natural resources present.

As many as ten additional back-country byways and bicycle trails could be identified by the public and designated by BLM over the next 15 years.

Developed recreation sites would be protected by closing these areas to grazing and surface-disturbing activities (except those associated with recreational development). Semi-primitive, nonmotorized areas would be protected by closing the areas to off-road use and surface-disturbing activities (except non-motorized management actions designed to enhance vegetation, wildlife habitat, riparian, soil, or water resources).

If cave resources are identified on public lands, appropriate action would be taken to inventory the resource and protect it from damage.

SOCIOECONOMICS

Socioeconomics is not a resource or program actively managed by BLM, like livestock or recreation, but a reactionary component that may represent the efficiency to the community from BLM management. By measuring the amount of money expected from each of BLM's programs plan, the community's stability and well-being may be evaluated.

To illustrate, consider the construction of recreation sites. BLM provides the funds to construct these new sites, stimulating local construction; these new facilities will allow more people to participate at any given time. With these additional visitors comes their associated spending patterns. This additional demand may eventually cause more facilities to be built, starting the cycle all over again. Or additional spending may give entrepreneurs incentives to invest in complements for these campgrounds, i.e., Good Sam Clubs. There are a variety of scenarios that all stimulate and promote the community from funds furnished by BLM.

Reasonable and foreseeable economic developments discussed here are based on past observations, as graphed extensively in Appendix 10.

It is understood and acknowledged that numerous economic figures, some incorporating multipliers and some not, may be used for assessing socioeconomic

**TABLE 4-2:
POTENTIAL COMMON USE/COMMUNITY
PIT AREAS FOR BLOW SAND, NORTH OF
VERNAL IN SPRING CREEK AREA**

NE 1/4 NE 1/4 SE 1/4	Sec. 18 T. 3 S. R. 21 E. Sec. 18 T. 3 S. R. 21 E.
SE 1/4 NE 1/4 NE 1/4 SE 1/4 SE 1/4 SE 1/4	Sec. 20 T. 3 S. R. 21 E. Sec. 20 T. 3 S. R. 21 E. Sec. 20 T. 3 S. R. 21 E.
SW 1/4 SW 1/4 NW 1/4 SW 1/4 SE 1/4 SW 1/4	Sec. 29 T. 3 S. R. 21 E. Sec. 29 T. 3 S. R. 21 E. Sec. 29 T. 3 S. R. 21 E.
SW 1/4 SW 1/4	Sec. 28 T. 3 S. R. 21 E.
NE 1/4 NE 1/4 NW 1/4 NW 1/4	Sec. 14 T. 3 S. R. 21 E. Sec. 14 T. 3 S. R. 21 E.

to upgrade or begin new construction on no more than one developed campground every five years. Projected increases in wildlife populations could provide up to 5,000 additional visitor days.

values of the management decisions outlined in this document. However, for socioeconomic analysis in this document, economic value data supplied by the BLM Utah State Office (1991) was used. These values do not incorporate the use of multipliers, determined to introduce too much variability into the analysis. These values and their references are included as Table A10-1 in Appendix 10.

It is reasonable to assume national and/or global political and economic conditions could combine to result in another energy boom on the scale of the 1981-85 boom sometime during the life of this plan (refer to Appendix 4, "Reasonable and Foreseeable Oil and Gas Development"). In addition, improving the transportation situation in and out of the Uinta Basin would help to support the growing tourism industry of the area.

SOILS AND WATER RESOURCES

Management actions that enhance or protect soil and water resources would be designed with measures that would preserve significant resource values.

The mixing of topsoil and sterile subsurface soil material in poorly developed soils can effectively reduce the soil's capabilities to successfully revegetate following disturbance. It was assumed extra rehabilitation efforts (e.g. mulching, chemical additives, drip irrigation) would be necessary on these soils, especially in the Myton Bench-Nine Mile area.

It was assumed that soil resources could be adversely affected two to three years following vegetation treatment activities (i.e., prescribed burns) until vegetation had recovered sufficiently to hold the soil in place. Until sufficient vegetation recovered on the treated site, topsoil could be transported off-site as suspended sediments and/or wind blown dust particles. This was seen as acceptable as the expected long-term benefits of improved watershed condition outweigh the short-term possible loss of the soil resource.

Future demand for the next 15 years should be met for planned industrial, municipal, and irrigation waters except during drought years. All surface water available for industry and irrigation have been appropriated. Should unforeseen major projects require more than .02 cfs, the demand could not be met. It was assumed the Castle Peak Salinity Reduction Demonstration Area implementation plan would continue as more emphasis on reducing sediment and salinity to the Colorado River system would be required. With adequate funding and personnel, this could be accomplished.

VEGETATION RESOURCES

Rangeland improvement actions would maintain or improve desired vegetation and riparian resources and would be designed with measures that preserve significant resource values. Short-term reductions in vegetation quality and quantity occur from vegetation manipulation actions, however long-term benefits outweigh the short-term impacts.

There is a historical demand placed on vegetation to provide forage for livestock, habitat for wildlife, cover for soil, filtration for water, and human-needed products such as firewood and fence posts. These historical demands are presently being met in the resource area.

Forage assignments would involve approximately 50-60 percent of the current year's vegetation production. The forage not assigned to big game would be sufficient to maintain the vegetation communities' productivity, meet the forage and cover requirements of non-big game species, and maintain watershed protection.

Ecological condition would be managed to meet desired plant community objectives designated by allotment at the activity plan level.

Existing wetland and riparian communities attract wild and domestic animal use and human recreation activities. The demand for improvement and use of these areas will continue to increase. Riparian areas in the resource area often coincide with access routes through mountainous terrain (i.e., Diamond Mountain and Three Corners areas). Due to the concentrated, often intense, use along certain portions of some riparian areas, their quality is degraded and quantity reduced.

By law, there is no "consumptive" demand for listed T&E plant species; however, the threat of cactus thievery exists. There is also a growing nonconsumptive demand by the scientific community regarding the inherent value of special status species.

Wildlife demands on vegetation are projected to increase. In certain areas of the resource area, i.e., Browns Park, it is likely the present vegetation resource could not support the desired wildlife numbers (refer to the Wildlife section).

The resource area has the capability and resources to provide for more than sufficient habitat for the presently known special status species, if other resource uses, particularly those involving surface-disturbing activities, are managed to safeguard these populations and habitats.

To lessen erosion and increase forage production for wildlife and livestock, vegetation treatments on approximately 1,200 acres per year would occur. Most of the treatment in the last 10 years has been prescribed burning of pinyon-juniper stands.

Total vegetation treatment opportunities could be realized on approximately 22,950 acres (or 3 percent of the BLM-administered lands) over the life of this plan. Based on an average of the total acres treated in the resource area during the past decade, it is reasonable to assume that approximately 1,530 acres could be successfully treated per year. Such an assumption is based on a continuation of present funding and staffing levels.

Riparian habitat would be protected by limiting grazing, surface-disturbing activities, and OHV use. Pipelines, utility structures and transportation facilities would be confined to established corridors and crossings. Special status plant habitat would be protected by limiting surface disturbance and OHV use.

VISUAL RESOURCES MANAGEMENT

Upon completion of the RMP, the existing VRM Class designations, delineated on Map 3-33, would be modified to reflect the decisions made in the plan. These adjusted visual resource values would be protected by managing activities and construction with mitigation that would protect the VRM classes.

WOODLANDS MANAGEMENT

Demand for wood products would continue at about the current level of approximately 2,500 cords per year, or increase slightly.

The selling price of a cord of wood outside the basin will remain near \$150 per cord; while selling prices within the basin will remain fairly constant at \$50 per cord.

Juniper posts and Christmas tree sales would be made available only to meet local demand.

Sale of other conifer species would only be made where it can be demonstrated to benefit either the forest or wildlife resource.

DIRECT AND INDIRECT IMPACTS OF IMPLEMENTING THE PROPOSED PLAN

This section has been changed, clarified, and strengthened in response to public and/or management comments on the draft. Analysis of the proposed plan and the alternatives to the socioeconomic structure have been expanded significantly. A summary of these impacts is provided in Table 2-15.

IMPACTS TO CULTURAL AND PALEONTOLOGICAL RESOURCES

From Management Actions for Cultural and Paleontological Resources

Requiring a paleontological survey on all lands identified as having high potential for paleontological resources, before any surface disturbing activity is permitted, would greatly reduce the potential of damage to these resources on 139,000 acres. Requiring mitigation would increase the amount of information we currently have, enabling us to better manage the resource.

Any paleontological information collected would increase knowledge of the behavior of different species of prehistoric animals, their social organization, including adaptive behavior and interspecies interactions.

From Management Actions for Fish and Wildlife Habitat Programs

Accidental disturbance of both cultural and paleontology resources would continue to occur as developments such as land treatments and water developments are completed to benefit wildlife.

Any paleontological information lost would limit the knowledge of the behavior of different species of prehistoric animals, their social organization including adaptive behavior and interspecies interaction.

Any cultural information that is lost would limit our ability to understand the behavior and social structure of past societies.

From Management Actions for Livestock Programs

Accidental disturbance of both cultural and paleontological resources would continue to occur as