

## **CHAPTER 2: ALTERNATIVES**

### **2.1 INTRODUCTION**

This chapter describes continuing management directives and the alternatives examined for the Resource Management Plan Amendment (RMPA)/Environmental Assessment (EA). Continuing management directives refers to the guidance provided by legislation, the existing Brantley and Avalon Reservoirs Resource Management Plan (RMP) (Reclamation 2003), and other relevant authority on U.S. Department of the Interior, Bureau of Reclamation (Reclamation)-administered lands within the Project Area that apply to all alternatives. This chapter describes the range of alternatives developed to address resource concerns identified through scoping. The alternative selected and documented in the RMPA will update existing management directives that pertain to energy and mineral development in the previous RMP. Those Reclamation land resources and programs not addressed in this document will continue to be managed as provided under the existing RMP (Reclamation 2003), which is outlined below in the section on continuing management directives.

### **2.2 CONTINUING MANAGEMENT DIRECTIVES AND ACTIONS**

This section describes the existing resource management directives and actions that will continue within the Project Area regardless of the alternative selected (i.e., they are common to all alternatives). It is based on the more detailed discussions provided in the RMP document (Reclamation 2003). The more detailed General Management Directives and Site-Specific Management Directives from the RMP Document are provided in Appendix B. The information that follows describes the Existing Management Strategy in the RMP and pertains only to Reclamation-administered lands within the Project Area.

#### **2.2.1 Description of the Existing Management Strategy**

The Existing Management Strategy (Figure 2-1) provides for a variety of land uses within the RMPA/EA Project Area (Project Area) including expanded developed recreation areas, improved Primitive Recreation Areas (designated sites, some limited facilities), and Wildlife Management Areas. New facilities and roads will be developed, as funding allows, including boating, camping, picnicking, hiking, and biking facilities. Facilities that improve or protect environmental quality are included, as well as regulation and information systems that inform the public. Land use cooperative agreements with jurisdictions for management of surrounding lands will be pursued. Grazing leases may be limited, reduced, increased, or maintained, based on the capability of the resources to sustain grazing, and grazing will be regulated in a more effective manner through development of an allotment-specific Grazing Management Plan by Reclamation, with assistance from the U.S. Department of the Interior, Bureau of Land Management (BLM). Under the Existing Management Strategy, some new recreational facility development will occur.

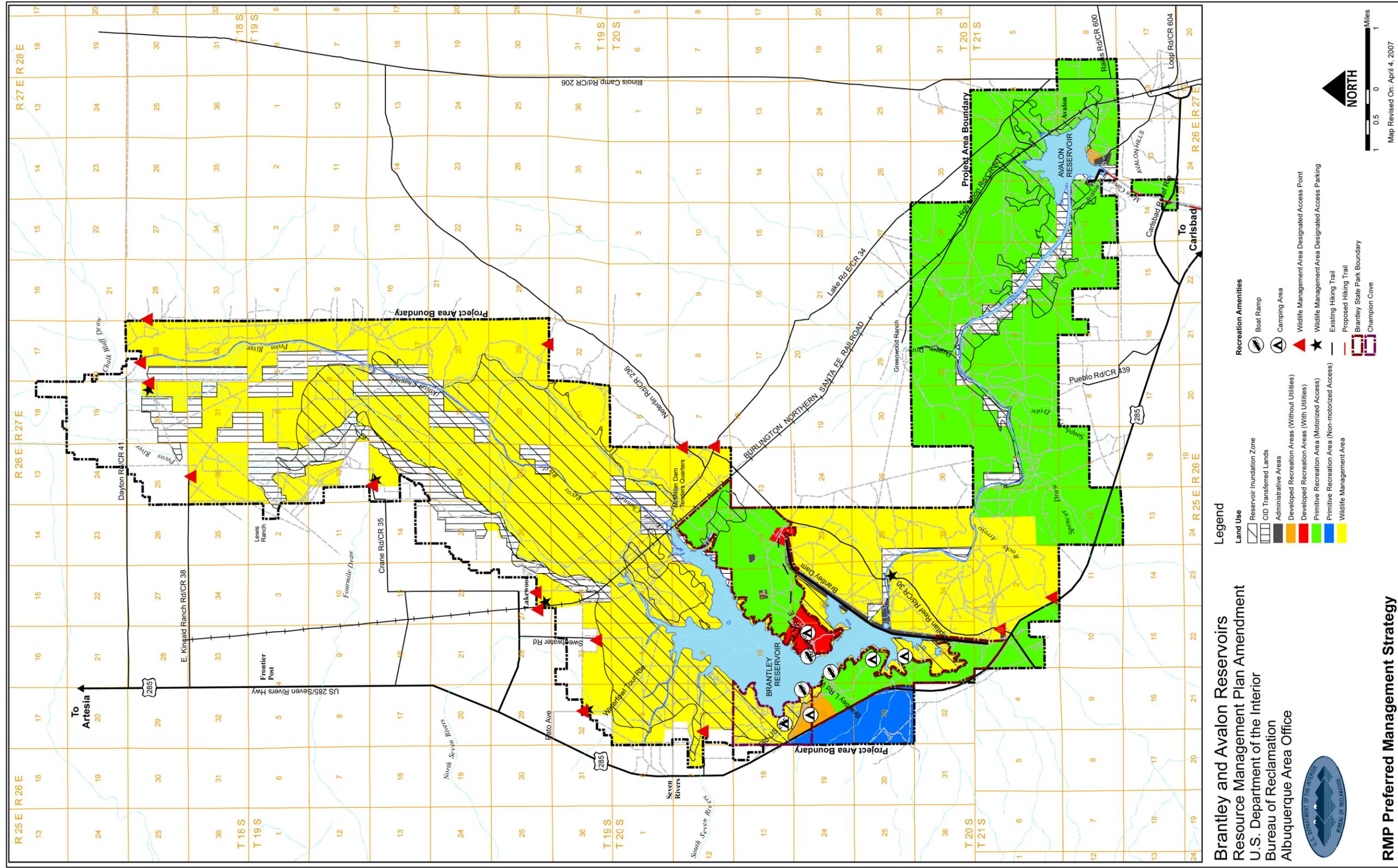


Figure 2-1. Brantley and Avalon Reservoirs Resource Management Plan (RMP) Existing Management Strategy.

**Brantley and Avalon Reservoirs**  
**Resource Management Plan Amendment**  
 U.S. Department of the Interior  
 Bureau of Reclamation  
 Albuquerque Area Office

**RMP Preferred Management Strategy**

- Legend**
- Land Use**
- Reservoir Inundation Zone
  - Old Transferred Lands
  - Administrative Areas
  - Developed Recreation Areas (Without Utilities)
  - Developed Recreation Areas (With Utilities)
  - Primitive Recreation Area (Motorized Access)
  - Primitive Recreation Area (Non-motorized Access)
  - Wildlife Management Area
- Recreation Amenities**
- Boat Ramp
  - Camping Area
  - Wildlife Management Area Designated Access Point
  - Wildlife Management Area Designated Access Parking
  - Existing Hiking Trail
  - Proposed Hiking Trail
  - Brantley State Park Boundary
  - Champion Cove



Map Revised On: April 4, 2007



Existing recreational developments will be maintained. Figure 2-1 shows the types and locations of facilities proposed under the Existing Management Strategy, and Table 2-1 provides a facility summary.

**Table 2-1. Land Use Categories and Recreation Facilities Summary for the Resource Management Plan (RMP) Existing Management Strategy.**

<b>LAND USE CATEGORIES AND RECREATION FACILITIES</b>	<b>EXISTING MANAGEMENT STRATEGY: MULTI-USE PURPOSE EMPHASIS</b>
<b>Land Use Categories</b>	
Developed Recreation Area (with utilities)	346 acres (140 hectares)
Developed Recreation Area (without utilities)	200 acres (81 hectares)
Primitive Recreation Area (motorized access)	16,354 acres (6,618 hectares)
Primitive Recreation Area (non-motorized access)	816 acres (330 hectares)
Wildlife Management Area	24,729 acres (10,007 hectares)
Administrative Area	398 acres (161 hectares)
<b>Recreation Facilities</b>	
Total Number of Dispersed Campsites <sup>a</sup>	1,717
Total Number of Developed Campsites	150
Total Number of Boat Ramps	3
Total Number of Developed Campgrounds	3
Total Number of Primitive Campgrounds	2
Approximate Facility Capacity <sup>b</sup> (Persons at One Time)	7,468
Approximate Boating Capacity (Boats at One Time)	Brantley = 113, Avalon = 20

<sup>a</sup> Dispersed Campsites are calculated as 0.10 campsite per acre (0.04 campsite per hectare) in Primitive Recreation Areas (motorized access).

<sup>b</sup> Calculated as total number of campsites multiplied by four persons; capacity will vary with water elevations.

### **2.2.2 Facility Management**

Within existing Project Area constraints, Reclamation will explore the possible reduction of water level fluctuations and recommend beneficial water operations to enhance resources under the Existing Management Strategy. If deemed to be legal, feasible, and practical, those organizations that receive water from the Carlsbad Project will be contacted and involved in the planning process. Any changes to water operations will be consistent with the original project authorization, existing international treaties, established Federal and State laws, and Pecos River Compact regulations. In addition, Reclamation will pursue an agreement with the Carlsbad Irrigation District (CID) for maintaining and protecting historic facilities and sites within the Project Area.

Reclamation completed the Pecos River Supplemental Water Project EA in 2009 in accordance with the National Environmental Policy Act (NEPA) to evaluate the impacts from a proposal to obtain supplemental water for the Pecos River (Reclamation 2009), which may affect future water operations and facility management within the Project Area. The project is needed to comply with the 2006–2016 Biological Opinion (BO) for the Carlsbad Project Water Operations and Water Supply Conservation Environmental Impact Statement (EIS) (Reclamation 2006a). The BO and EIS commit Reclamation to operate the Carlsbad Project with a target flow of 35 cubic feet per second (cfs) at the Taiban Gage and keep the river in continuous flow in order to conserve the Federally protected Pecos bluntnose shiner (*Notropis simus pecosensis*). The purpose of the project is to provide adequate water to keep the river continuous, meet the contracted irrigation needs of the Carlsbad Project, avoid hindering New Mexico delivery requirements to Texas, and to establish partnerships in the basin. Reclamation obtained supplemental water to provide the operational ability to release approximately 2,500 acre-feet of water out of Sumner Lake per year, while also ensuring that there is enough water at Brantley Reservoir to meet the contracted irrigation needs of the Carlsbad Project.

### **2.2.3 Land Use**

Under the Existing Management Strategy, Reclamation and New Mexico State Parks Division (State Parks) will implement a public education and information program at Brantley and Avalon Reservoirs regarding waste disposal, existing regulations, recreational opportunities, recreational use guidelines, Project Area signing, and Project Area mapping. The current “no wake” designation for shoreline areas at Brantley Reservoir will remain in force. Avalon Reservoir will be managed as a “no wake” lake under the Existing Management Strategy. Four new Developed Recreation Areas (without utilities) will be developed; one each at Avalon Reservoir, McMillan Dam Tender’s Quarters, Champion Cove, and West Side Brantley Lake State Park.

Reclamation will continue to implement oil and gas leasing stipulations under the Existing Management Strategy in an effort to prevent or reduce impacts to other Project Area resources. Oil and gas leasing stipulations include No-Surface Occupancy Zones to reduce resource conflicts within the Project Area. Reclamation will develop and implement an agreement between management agencies to notify and coordinate oil and gas activities within the Project Area. Reclamation’s oil and gas leasing stipulations from the 2003 RMP are included in Appendix A.

Under the Existing Management Strategy, Reclamation will develop and implement an access management plan to define public access sites, indicate agency jurisdiction, and prepare access regulations for the Project Area. Roads accessing existing Developed and Primitive Recreation Areas will be maintained and improved as needed. However, approximately 133 miles (214 kilometers) of currently unmanaged and unmaintained roads will be closed and revegetated.

Four new primitive access sites with small gravel parking areas will be developed in the Brantley Wildlife Management Area north of Brantley Reservoir. These include the Seven Rivers North Access Site, Lakewood Access Site, Fourmile Draw Access Site, and North Access Site. Motorized access to Wildlife Management Areas will be limited to existing travel routes, and non-motorized access could be restricted on a seasonal basis, if necessary, for the benefit of specific wildlife species.

State Parks will continue to implement access-control points within Brantley Lake State Park, and shoreline vehicular access will be prevented except at designated areas such as existing boat ramps and shoreline access points. Public and private access points to the Project Area will be clarified and restricted to designated routes. Reclamation will control access to sensitive areas (e.g., wildlife habitat, archaeological sites, Project facilities) and pursue an agreement among State Parks, New Mexico Department of Game and Fish (NMDGF), and State and local governments for management and jurisdiction of Project Area roads.

Permitted grazing will continue on approximately 12,762 acres (5,165 hectares) of Reclamation-administered lands under the Existing Management Strategy. Reclamation will pursue an agreement with the BLM for coordinated management of grazing within the Project Area. Agreements with surrounding property owners and Eddy County will be sought in order to assure that surrounding land uses are compatible with and complementary to recreation development and wildlife management within the Project Area.

#### **2.2.4 Recreation**

Under the Existing Management Strategy, the number of potential dispersed campsites found within Primitive Recreation Areas (motorized and non-motorized access) will decrease from the existing 1,737 to a total of 1,717 as a result of increased Developed Recreation Areas (both with and without utilities). The number of developed campsites will increase from 51 (existing) to 150 as a result of adding 99 potential camping units in several new campgrounds. However, the actual number of camping units developed may vary given site-specific resource considerations. Hunting and fishing will still be allowed within the Project Area as specified by the NMDGF. Recreational facilities not currently meeting Americans with Disabilities Act (ADA) standards will be improved to meet ADA requirements.

A capacity limit regarding the number of boats at one time (BAOT) on the reservoir will be established and enforced. Under the Existing Management Strategy, BAOT capacity will be established at 33 acres (13 hectares) per boat. Using this figure, approximately 113 BAOT will be allowed at Brantley Reservoir, and 20 BAOT will be allowed at Avalon Reservoir when the reservoirs are full. A new, non-motorized, multi-use trail system will be constructed under the Existing Management Strategy to connect Avalon Reservoir with the Flume in the City of Carlsbad.

Based on the number of available campsites, boat ramps, and BAOT, the Existing Management Strategy is designed to accommodate 7,468 persons at one time (PAOT) (i.e., maximum daily capacity). It is expected that yearly attendance will increase over current levels because of the increased capacity of Developed Recreation Areas (with and without utilities), the improved condition of the facilities, the broadened recreation opportunities that will be provided, and regional population growth. Primitive recreation visitation will be expected to remain about the same as under current conditions. Annual visitation to Brantley Lake State Park will be expected to grow moderately (by less than 5 percent annually) with the addition of proposed developed and primitive recreational facilities.

### **2.2.5 Natural and Cultural Resources**

Reclamation, State Parks, the State of New Mexico Environment Department/Surface Water Quality Bureau, and other agencies (as appropriate) will protect and/or enhance the water quality of Brantley and Avalon Reservoirs. This action will include completing additional baseline quality studies and monitoring water quality.

In cooperation with State Parks and the NMDGF, Reclamation will determine the need to develop and implement an Integrated Pest Management Plan for vegetation and rodents. Control methods could include mowing, bulldozing, applying chemicals, burning, removing, pulling, and trapping. This plan would update and improve the vegetation management program currently being implemented.

The NMDGF, State Parks, and Reclamation will determine the need to develop and implement a Fishery Management Plan that would seek to enhance recreational fishing opportunities where feasible within existing operating criteria. The Fishery Management Plan would evaluate the need for catch limitations or other management modifications and implement such management actions as appropriate. In addition, fishing regulations will be established for certain bay areas to protect the fishing experience for anglers and reduce conflicts with recreational boaters. An interpretive display highlighting fish and wildlife found within the Project Area will be developed at the Visitor Center.

Reclamation currently has a wildlife management plan on the Reclamation Albuquerque Area Office website (Reclamation 2010). This plan is titled “Lower Pecos River Waterfowl and Wildlife Areas Management Plan for the Brantley Project Mitigation Lands 2005–2010.” State Parks, NMDGF, and the U.S. Fish and Wildlife Service (USFWS), and other agencies (as appropriate) will develop and implement a Wildlife Management Plan for protection and enhancement of wildlife species within Wildlife Management Areas. The Wildlife Management Plan will specify management responsibilities, designate sensitive habitats, and recommend enhancement opportunities. These same entities will develop and implement a wetlands management plan that may identify restrictions of recreational activities in wetland areas and will increase protection and enhancement opportunities within the Project Area.

Integral to the recommended mitigation measures and resource planning will be the development and use of interpretive signage. These features will promote a better public understanding of the Project Area's natural and cultural resource issues and how they relate to reservoir use. The success of a mitigation or enhancement program is often connected to the type and amount of public interpretation and communication. Reclamation and State Parks will be encouraged to develop an Interpretive Master Plan for the Project Area.

Consistent with Federal and State laws and regulations, cultural and paleontological sites will continue to be protected from the unauthorized collection and excavation of artifacts and all other ground-disturbing activities. However, protection of archaeological and paleontological resources will be emphasized, and the existing cultural resources program will be enhanced. A permit and compliance with the National Historic Preservation Act will be required for any professional excavation of archaeological or historic sites.

### **2.3 DESCRIPTION OF THE PROPOSED RMPA ALTERNATIVES**

This section describes the three alternatives analyzed in this RMPA/EA. Alternative A is to maintain the existing (2003) oil and gas leasing stipulations, which follows the existing management strategy defined in Reclamation's 2003 RMP and maintains the existing maximum conservation pool elevation. Alternative B proposes to maintain the existing maximum conservation pool elevation with revised (2010) oil and gas leasing stipulations, while Alternative C incorporates revised maximum conservation pool elevations at Brantley Reservoir plus the new 2010 oil and gas leasing stipulations. The alternatives were developed to respond to issues identified through scoping. The projected minerals development activity and associated amount of surface disturbance predicted for the Project Area over the next 20 years varies for each alternative. It should be noted that development of existing Federal mineral leases would continue according to the terms of the lease at the time of execution, until such time as the lease expires and becomes subject to the terms in place upon expiration. As such, of the approximately 43,745 acres (17,703 hectares) of Federal (Reclamation) lands within the Project Area boundary, less than 9,361 acres (3,788 hectares), or 21 percent, are currently identified as ***Unleased Federal Minerals*** that would be immediately subject to the new oil and gas leasing stipulations under Alternatives B and C (Table 2-2). Figure 2-2 shows the location of various minerals leasing categories within the Project Area including Federal minerals.

Of the 49,493 acres (20,029 hectares) of land within the Project Area, only 43,745 acres (17,703 hectares) will be subject to the stipulations present in any of the action alternatives. These lands comprise four minerals categories identified in Table 2-2. Federal Minerals Leased Lands, which account for 25,242 acres (10,215 hectares) of the Project Area, include Federally owned minerals that are currently leased and subject to the lease stipulations in place at the time those minerals were leased. Federal Minerals Unleased Lands comprise 9,361 acres (3,788 hectares) of the Project Area, while Reclamation Minerals Subordinate Lands comprise 3,553 acres (1,438

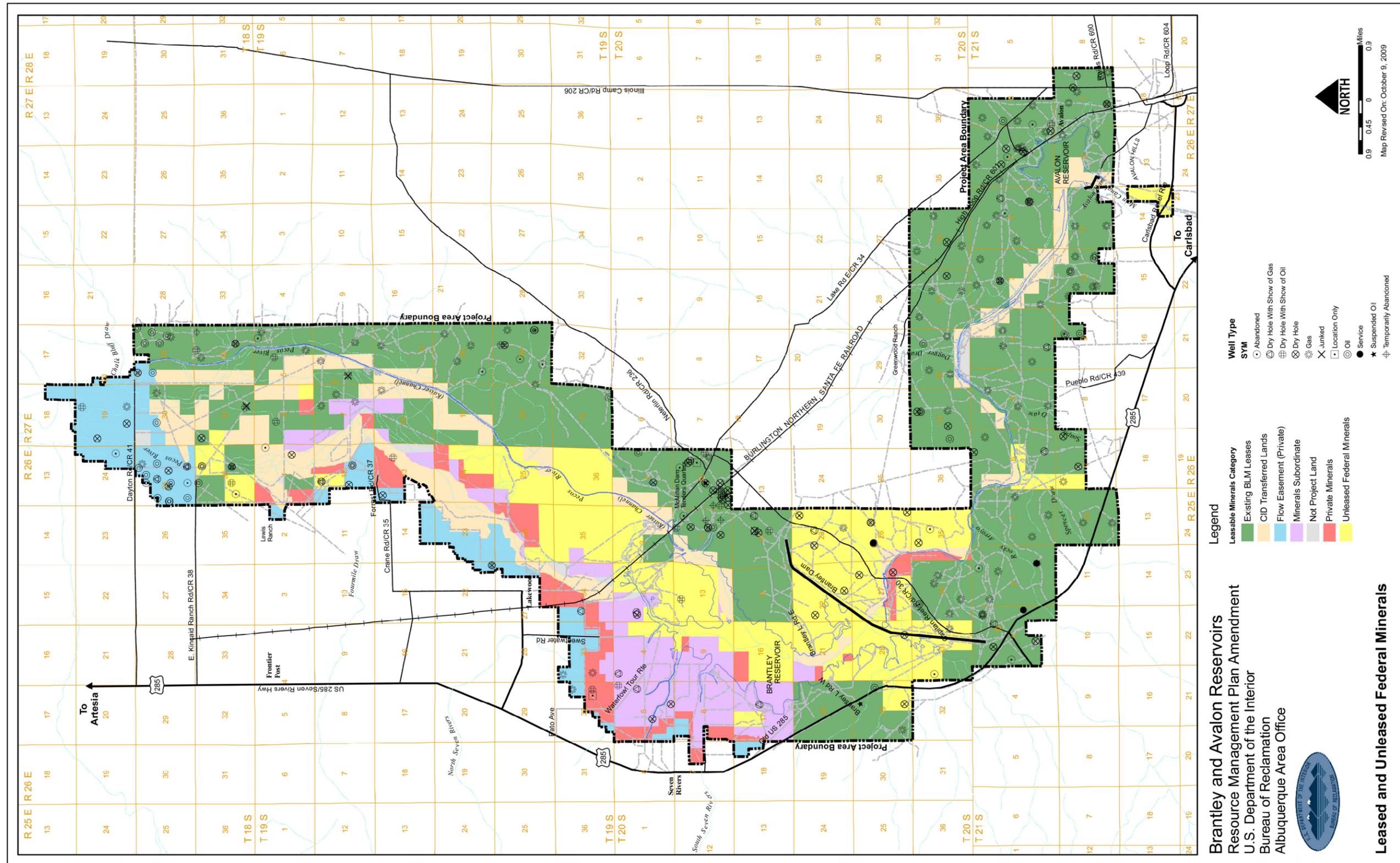


Figure 2-2. Brantley and Avalon Reservoirs Resource Management Plan Amendment (RMPA) Project Area Leased and Unleased Federal Minerals.

**Table 2-2. Leased and Unleased, Federal and Private Minerals within the Resource Management Plan Amendment (RMPA) Boundary.**

<b>MINERALS CATEGORY</b>	<b>AREA IN ACRES</b>
Federal Minerals (Reclamation) Leased Lands	25,242 (10,215 hectares)
Federal Minerals (Reclamation) Unleased Lands	9,361 (3,788 hectares)
Reclamation Flowage Easement Lands (non-Federal lands)	3,349 (1,355 hectares)
Reclamation Minerals Subordinate Lands (Federal lands)	3,553 (1,438 hectares)
Carlsbad Irrigation District Lands	5,589 (2,262 hectares)
Private (non-Federal) Minerals	2,085 (844 hectares)
Non-Reclamation Lands	314 (127 hectares)
<b>Total Area</b>	<b>49,493 (20,029 hectares)</b>

hectares) of the Project Area. Although the Reclamation Minerals Subordinate Lands involve private minerals that cannot be leased by the United States, Reclamation acquired and retains the right to restrict the development of the mineral estate to conform to Reclamation stipulations.

The fourth category involves CID Lands. In 2001 the United States conveyed the surface and mineral estate of 5,589 acres (2,262 hectares) of Project Area lands to the CID. The lands conveyed to CID are subject to management consistent with the management by Reclamation on adjacent lands, including the rights and obligations related to the mineral estate. The CID mineral estate is considered private and subject to the laws and regulations of the State of New Mexico. However, the CID mineral estate can only be leased in compliance with the stipulations in place by Reclamation for the leasing of Federal minerals at the time of lease issuance. Currently, the majority of the CID mineral estate is leased and subject to the stipulations in place at the time those minerals were leased.

There are 2,085 acres (844 hectares) of Reclamation lands within the Project Area that contain Private (non-Federal) Minerals that are not subject to Federal Mineral stipulations, but are subject to the surface use stipulations as permitted by Reclamation. Reclamation also obtained flowage easements on 3,349 acres (1,355 hectares) of non-Federal land that are also not subject to Federal stipulations (Reclamation Flowage Easement Lands). And there are 314 acres (127 hectares) of private surface and private minerals lands that are not subject to the jurisdiction of the United States.

Federal mineral leasing and development may occur on lands where the surface is managed by Federal, State, Native American agencies, or private individuals. For minerals development on Federal (Reclamation) lands within the Project Area, management objectives are defined in terms of the availability of land for leasing (i.e., closed or open to minerals leasing) and the management of lands that are open to leasing (i.e., with standard terms and conditions or with special leasing stipulations). Federal mineral lands and lands subject to Federal mineral leasing stipulations account for 43,745 acres (17,703 hectares), or 88 percent, of the Project Area. All Federal mineral lands and lands subject to Federal mineral leasing stipulations within the Project Area are considered open for minerals leasing.

Lands open for minerals leasing may be open with no specific development restrictions defined in the original RMP or in the RMPA. However, these areas are subject to the ***Standard Lease Terms and Conditions*** as defined on the lease form and shown in Appendix A. Or, lands open for leasing may be managed with constraints in the form of ***Special Lease Stipulations***, which are provisions that modify the standard lease rights and conditions included in a lease when environmental and planning analyses have demonstrated that additional and more stringent environmental protection is needed. The three types of special lease stipulations defined for the Project Area are (1) ***no surface occupancy***, (2) ***no storage facilities***, and (3) ***surface occupancy on a case-by-case basis***. A stipulation of no surface occupancy does not allow the surface of a given area to be occupied by oil and gas development facilities. A stipulation of no storage facilities does not allow storage facilities within a given area. A stipulation of surface occupancy on a case-by-case basis allows for a site-specific evaluation of proposed activities to determine the appropriateness of surface occupancy and storage facilities. Under certain conditions, Reclamation may grant waivers, exceptions, or modifications to lease stipulations as defined in Appendix A and according to *Reclamation Manual Directives and Standards*.

The three alternatives analyzed in this RMPA/EA are distinguished by the type and degree of special lease stipulation constraints. Oil and gas development activities would continue to be evaluated on a case-by-case basis for all three alternatives. Alternative A represents continued implementation of existing management plans, policies, and decisions. Alternative B and Alternative C represent a change in existing management. All three alternatives address existing legislative and regulatory requirements at a programmatic level and/or places constraints if resource values are determined to be sufficiently high or protections are justified in the public interest. In addition, Alternative C incorporates a new analysis of the 100-year sedimentation estimate for Brantley Reservoir (Reclamation 2008). Reclamation has selected Alternative C as the Preferred Alternative.

Each alternative is described generally below. Table 2-3 provides a summary comparison of special lease stipulations for each of the alternatives. Tables 2-4, 2-5, and 2-6 provide a detailed summary of special lease stipulations by alternative, while Figures 2-3, 2-4, and 2-5 illustrate their geographic locations by alternative. Following this alternative descriptions section, a summary of the impacts associated with each alternative is described in Section 2.4.

### **2.3.1 Alternative A: 2003 RMP with Old Oil and Gas Leasing Stipulations and Old Maximum Conservation Pool Elevation**

For Alternative A, existing special lease stipulations for oil and gas development within the Project Area would remain in effect (Figure 2-3). Leasing and development of Federal minerals would continue as specified in the existing RMP for the Project Area (Reclamation 2003). Reclamation, through the BLM, would continue to implement existing standard lease terms and conditions and special lease stipulations to conduct operations in a manner that would minimize adverse impacts on resources, land uses, and users.

**Table 2-3. Summary Comparison of Special Lease Stipulations by Alternative.**

LEASABLE MINERALS CATEGORY	NO SURFACE OCCUPANCY	NO STORAGE FACILITIES	SURFACE OCCUPANCY ON A CASE-BY-CASE BASIS	NO SPECIAL LEASE STIPULATIONS
Alternative A: 2003 RMP with Old Oil and Gas Leasing Stipulations and Old Maximum Conservation Pool Elevation	25,808 acres (10,445 hectares)	8,352 acres (3,380 hectares)	1,629 acres (659 hectares)	13,704 acres (5,546 hectares)
Alternative B: 2003 RMP with New Oil and Gas Leasing Stipulations and Old Maximum Conservation Pool Elevation	40,478 acres (16,382 hectares)	0 acre (0 hectare)	957 acres (387 hectares)	8,057 acres (3,261 hectares)
Alternative C: 2003 RMP with New Oil and Gas Leasing Stipulations and New Maximum Conservation Pool Elevation	19,155 acres (7,752 hectares)	6,486 acres (2,625 hectares)	13,527 acres <sup>a</sup> (5,474 hectares) <sup>a</sup>	10,324 acres (4,178 hectares)

<sup>a</sup> No wells permitted.

**Table 2-4. Detailed Area Summary of Special Lease Stipulations for Alternative A (2003 RMP with Old Oil and Gas Leasing Stipulations and Old Maximum Conservation Pool Elevation).**

LEASABLE MINERALS CATEGORY	NO SURFACE OCCUPANCY	NO STORAGE FACILITIES	SURFACE OCCUPANCY ON A CASE-BY-CASE BASIS	NO SPECIAL LEASE STIPULATIONS
Federal Minerals (Reclamation) Leased Lands	9,833 acres (3,979 hectares)	3,391 acres (1,372 hectares)	875 acres (354 hectares)	11,143 acres (4,510 hectares)
Federal Minerals (Reclamation) Unleased Lands	7,040 acres (2,849 hectares)	451 acres (183 hectares)	648 acres (262 hectares)	1,222 acres (495 hectares)
Reclamation Flowage Easements (non-Federal lands)	163 acres (66 hectare)	2,292 acres (928 hectares)	0 acre (0 hectare)	894 acres (362 hectares)
Reclamation Minerals Subordinate (Federal lands)	3,548 acres (1,436 hectares)	5 acres (2 hectares)	0 acre (0 hectare)	0 acre (0 hectare)
Carlsbad Irrigation District Lands	3,824 acres (1,548 hectares)	1,533 acres (620 hectares)	39 acres (16 hectares)	193 acres (78 hectares)
Private (non-Federal) Minerals	1,133 acres (459 hectares)	633 acres (256 hectares)	67 acres (27 hectares)	252 acres (102 hectares)
Non-Reclamation Lands	267 acres (108 hectares)	47 acres (19 hectares)	0 acre (0 hectare)	0 acre (0 hectare)
<b>Total Area</b>	<b>25,808 acres (10,445 hectares)</b>	<b>8,352 acres (3,380 hectares)</b>	<b>1,629 acres (659 hectares)</b>	<b>13,704 acres (5,546 hectares)</b>

**Table 2-5. Detailed Area Summary of Special Lease Stipulations for Alternative B (2003 RMP with New Oil and Gas Leasing Stipulations and Old Maximum Conservation Pool Elevation).**

LEASABLE MINERALS CATEGORY	NO SURFACE OCCUPANCY	NO STORAGE FACILITIES	SURFACE OCCUPANCY ON A CASE-BY-CASE BASIS	NO SPECIAL LEASE STIPULATIONS
Federal Minerals (Reclamation) Leased Lands	18,220 acres (7,374 hectares)	0 acre (0 hectare)	646 acres (261 hectares)	6,376 acres (2,580 hectares)
Federal Minerals (Reclamation) Unleased Lands	8,159 acres (3,302 hectares)	0 acre (0 hectare)	300 acre (121 hectare)	902 acres (365 hectares)
Reclamation Flowage Easements (non-Federal lands)	2,686 acres (1,087 hectares)	0 acre (0 hectare)	0 acre (0 hectare)	663 acres (268 hectares)
Reclamation Minerals Subordinate (Federal lands)	3,552 acres (1,438 hectares)	0 acre (0 hectare)	0 acre (0 hectare)	0 acre (0 hectare)
Carlsbad Irrigation District Lands	5,533 acres (2,239 hectares)	0 acre (0 hectare)	0 acre (0 hectare)	56 acres (23 hectares)
Private (non-Federal) Minerals	2,014 acres (815 hectares)	0 acre (0 hectare)	11 acres (4 hectares)	60 acres (24 hectares)
Non-Reclamation Lands	314 acres (127 hectares)	0 acre (0 hectare)	0 acre (0 hectare)	0 acre (0 hectare)
<b>Total Area</b>	<b>40,478 acres (16,382 hectares)</b>	<b>0 acre (0 hectare)</b>	<b>957 acres (387 hectares)</b>	<b>8,057 acres (3,261 hectares)</b>

**Table 2-6. Detailed Area Summary of Special Lease Stipulations for Alternative C (2003 RMP with New Oil and Gas Leasing Stipulations and New Maximum Conservation Pool Elevation).**

LEASABLE MINERALS CATEGORY	NO SURFACE OCCUPANCY	NO STORAGE FACILITIES	SURFACE OCCUPANCY ON A CASE-BY-CASE BASIS <sup>a</sup>	NO SPECIAL LEASE STIPULATIONS
Federal Minerals (Reclamation) Leased Lands	9,799 acres (3,966 hectares)	1,354 acres (548 hectares)	6,392 acres (2,587 hectares)	7,697 acres (3,115 hectares)
Federal Minerals (Reclamation) Unleased Lands	4,898 acres (1,982 hectares)	1,584 acres (641 hectares)	1,876 acres (759 hectares)	1,003 acres (406 hectares)
Reclamation Flowage Easements (non-Federal lands)	26 acres (11 hectares)	903 acres (365 hectares)	1,147 acres (464 hectares)	1,273 acres (515 hectares)
Reclamation Minerals Subordinate (Federal lands)	2,424 acres (981 hectares)	439 acres (178 hectares)	690 acres (279 hectares)	0 acre (0 hectare)
Carlsbad Irrigation District Lands	1,551 acres (628 hectares)	1,424 acres (576 hectares)	2,523 acres (1,021 hectares)	91 acres (37 hectares)
Private (non-Federal) Minerals	310 acres (125 hectares)	762 acres (308 hectares)	753 acres (305 hectares)	260 acres (105 hectares)
Non-Reclamation Lands	147 acres (59 hectares)	20 acres (8 hectares)	146 acres (59 hectares)	0 acre (0 hectare)
<b>Total Area</b>	<b>19,155 acres (7,752 hectares)</b>	<b>6,486 acres (2,625 hectares)</b>	<b>13,527 acres (5,474 hectares)</b>	<b>10,324 acres (4,178 hectares)</b>

<sup>a</sup> No wells permitted.

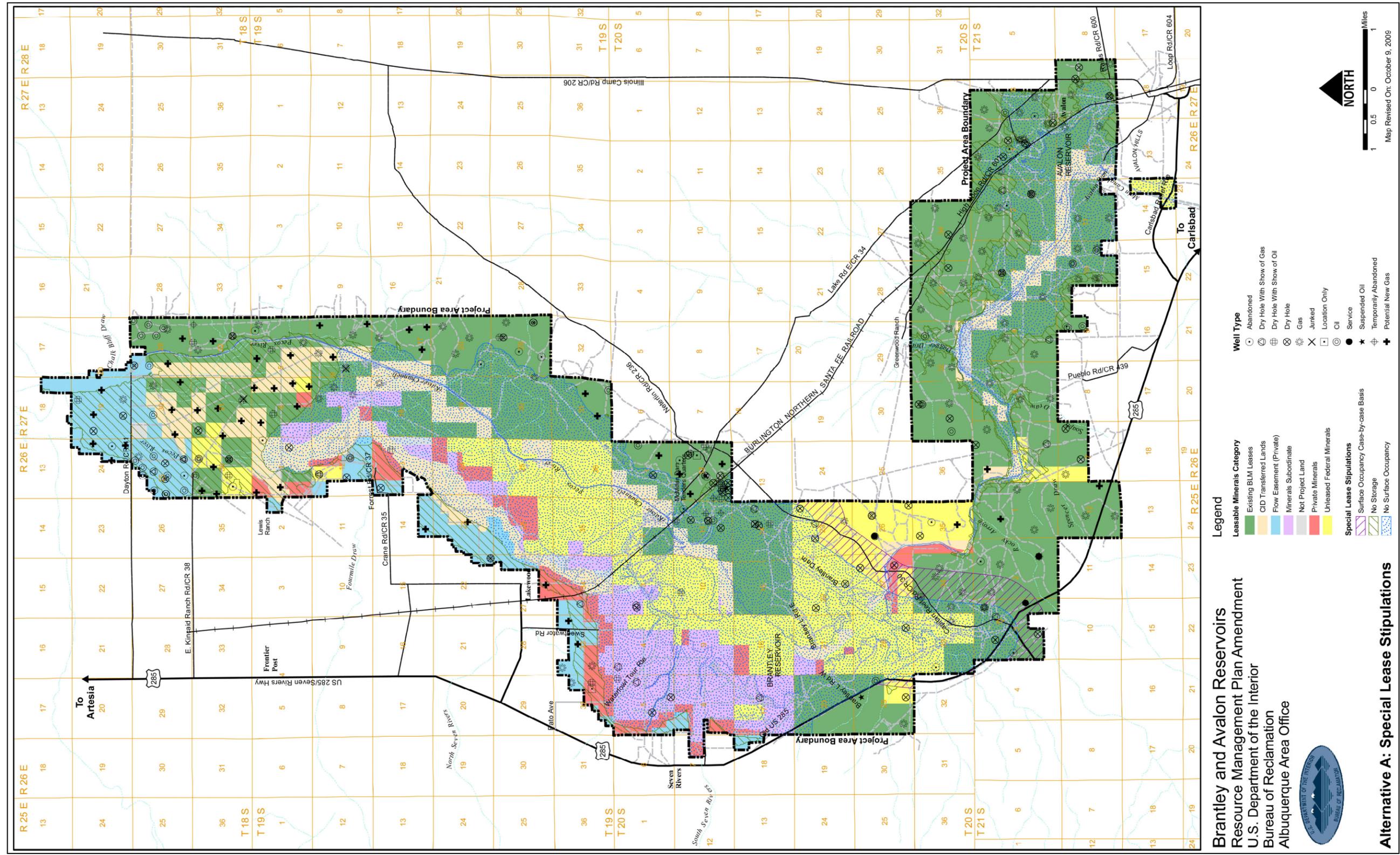


Figure 2-3. Alternative A Special Lease Stipulations.

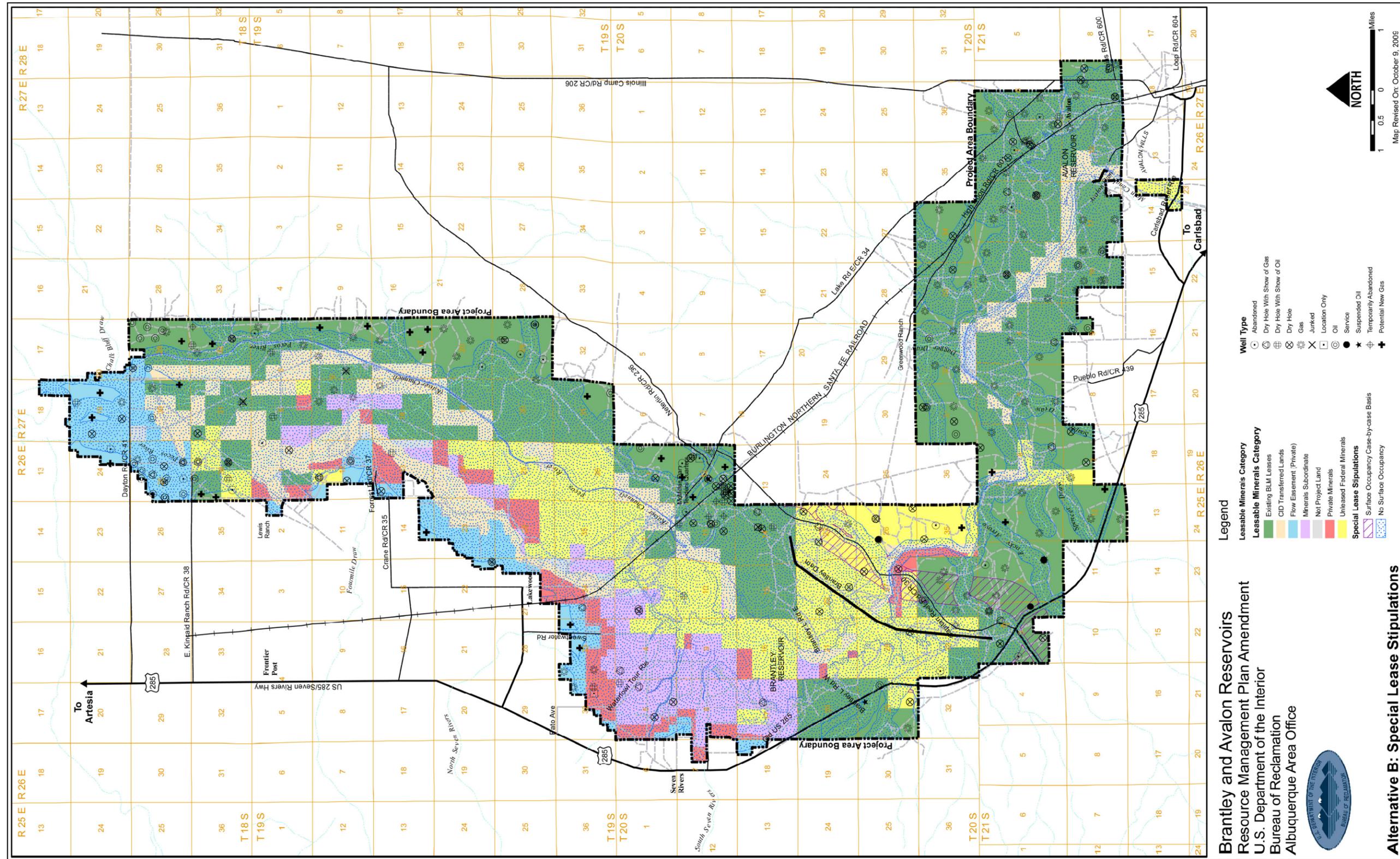


Figure 2-4. Alternative B Special Lease Stipulations.



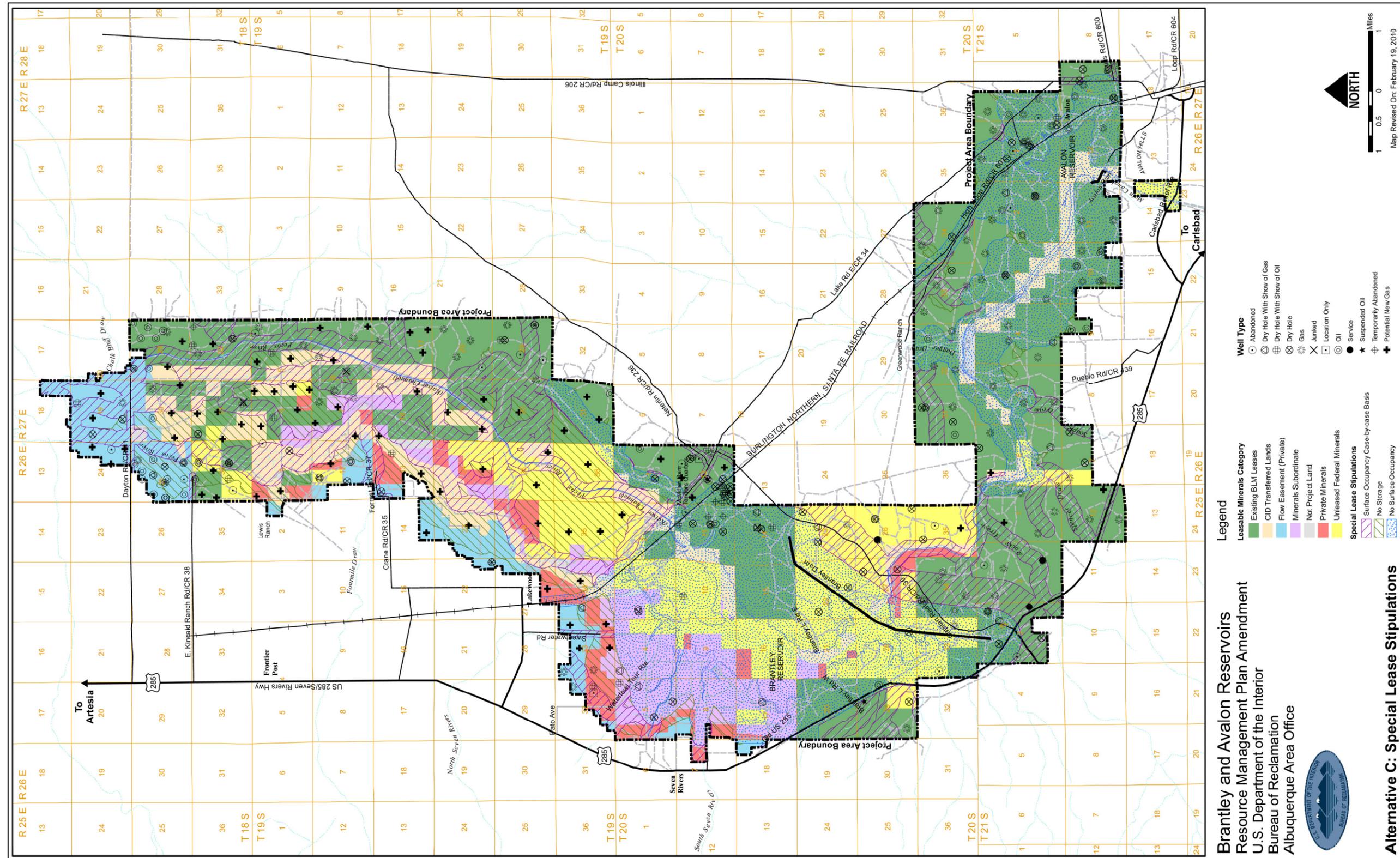


Figure 2-5. Alternative C Special Lease Stipulations.

The specific, special lease stipulations applied to meet existing management objectives of Alternative A are summarized below and shown on Figure 2-3.

- No surface occupancy within 2,640 horizontal feet (805 horizontal meters) of Brantley Dam or Avalon Dam Sites.
- Surface occupancy on a case-by-case basis for wells proposed between 2,640 horizontal feet (805 horizontal meters) and 5,280 horizontal feet (1,609 horizontal meters) of Brantley Dam Site.
- No surface occupancy within 660 horizontal feet (200 horizontal meters) of or below maximum conservation pool elevation of 3,271 feet (997 meters) at Brantley Reservoir.
- No storage facilities below an elevation of 3,286 feet (1,002 meters) at Brantley Reservoir.
- No surface occupancy within 660 horizontal feet (200 horizontal meters) of or below maximum conservation pool elevation of 3,190 feet (972 meters) at Avalon Reservoir.
- No storage facilities below an elevation of 3,200 feet (975 meters) at Avalon Reservoir.
- No surface occupancy within Brantley Lake State Park or Champion Cove recreation areas.

Under Alternative A, minerals leasing and development would continue under existing management direction. Approximately 28 percent of the Project Area would be open to minerals leasing with standard lease terms and conditions (see Appendix A). Approximately 52 percent of the Project Area could be leased with a special lease stipulation of no surface occupancy, while approximately 17 percent of the Project Area could be leased with a special lease stipulation of no storage facilities. The remainder of the Project Area (approximately 3 percent) could be leased if site-specific evaluations determined that leasing would not conflict with applicable regulations, including CID and Reclamation Project purposes, and if measures to mitigate potential impacts were applied as conditions of approval. With the conditions of approval and other requirements, impacts on resources of concern, as described in Chapter 3, are not anticipated to be significant.

### **2.3.2 Alternative B: 2003 RMP with New Oil and Gas Leasing Stipulations and Old Maximum Conservation Pool Elevation**

Alternative B modifies the existing management situation to respond to legislative policies, regulatory requirements, and/or *Reclamation Manual* directives and standards that otherwise are not currently included under Alternative A. In doing so, the major issues addressed include minimizing soil erosion, protecting Reclamation facilities, protecting cultural resources, protecting wildlife and special status species, protecting visual resources, and protecting water quality.

The specific, special lease stipulations applied to meet the management objectives of Alternative B are summarized below and shown on Figure 2-4. These specific stipulations would replace and/or supplement the General Surface Use and Occupancy Requirements found in Appendix A, Section A-1 if this alternative is implemented.

- No surface occupancy within 2,640 horizontal feet (805 horizontal meters) of dam embankments, appurtenant structures, and tunnels at Brantley Dam or Avalon Dam Sites.
- Surface occupancy on a case-by-case basis for wells proposed between 2,640 horizontal feet (805 horizontal meters) and 5,280 horizontal feet (1,609 horizontal meters) of Brantley Dam Site.
- No surface occupancy within the 100-year floodplain at Brantley Reservoir (elevation 3,283 feet [1,001 meters]) or Avalon Reservoir (elevation 3,200 feet [975 meters]) or within a buffer 660 horizontal feet (200 horizontal meters) above these elevations.
- No surface occupancy within 300 horizontal feet (91 horizontal meters) of all publicly maintained (e.g., State of New Mexico, Eddy County) designated roads and highways.
- No surface occupancy within 660 horizontal feet (200 horizontal meters) of normal high water line of streams, rivers, and arroyos.
- No surface occupancy within 300 horizontal feet (91 meters) of all areas leased for recreational purposes (e.g., Brantley Lake State Park and Champion Cove).
- No surface occupancy within 500 horizontal feet (152 meters) of any improvements either owned, permitted, leased, or otherwise authorized by Reclamation within the leased areas.
- No surface occupancy within 200 horizontal feet (61 meters) of all designated, improved, and permitted trails.
- No surface occupancy within 200 horizontal feet (61 meters) of established crops.
- No surface occupancy within slopes steeper than 2:1 and within 200 horizontal feet (61 meters) of slopes steeper than 2:1.
- No surface occupancy within established right-of-ways of human-made canals, laterals, aqueducts, pipelines, or drainages.
- No surface occupancy within Critical or Occupied Habitat for Federally listed threatened or endangered species, and access may be restricted seasonally in other important wildlife areas.

Alternative B incorporates legislative and regulatory requirements and/or management objectives that currently are not included under existing management (i.e., Alternative A). The amount of land open to leasing with a special lease stipulation of no surface occupancy would increase substantially to 40,478 acres (16,382 hectares), or 82 percent of the Project Area, as compared to Alternative A. The amount of land that could be leased with standard lease terms and conditions would decrease to 8,057 acres (3,261 hectares), or 16 percent of the Project Area, as compared to Alternative A. About 2 percent of the Project Area could be leased if site specific evaluations determined that leasing would not conflict with applicable regulations (i.e., surface occupancy would be considered on a case-by-case basis).

While Alternative B represents an increase in constraints beyond the existing management situation (i.e., Alternative A), Alternative B provides for maximum resource protection while allowing for some mineral leasing and development to occur within the Project Area. Alternative B consolidates the requirements and objectives at the programmatic level, which would clarify the leasing process for industry, Reclamation, and BLM, and would streamline the NEPA process for site-specific actions. As with Alternative A, impacts on resources of concern, as described in Chapter 3, are not anticipated to be significant under Alternative B with implementation of the conditions of approval and other requirements.

While providing more protection for resource concerns than Alternative A, the increased amount of land closed to leasing in Alternative B would limit the spatial area in which to explore for and develop fluid minerals in certain locales. This could reduce the opportunity and/or increase the cost for oil and gas development activities in the Project Area.

### **2.3.3 Alternative C: 2003 RMP with New Oil and Gas Leasing Stipulations and New Maximum Conservation Pool Elevation**

Alternative C modifies Alternative B to respond to concerns expressed by CID regarding the estimated 100-year sedimentation rate for Brantley Reservoir. Similar to Alternative B, Alternative C also addresses minimizing soil erosion, protecting Reclamation facilities, protecting cultural resources, protecting wildlife and special status species, protecting visual resources, and protecting water quality. The primary difference is that the maximum water surface elevation at Brantley Reservoir would be revised from 3,271 feet (997 meters) to 3,263 feet (995 meters), and a no surface occupancy special lease stipulation would be applied below that elevation. Although Brantley Dam was first filled in 1988, the original 100-year sediment deposition estimate for Brantley Reservoir was completed in the 1950s based on limited water and suspended sediment data. New estimates were made by Reclamation using a longer-period of flow and sediment gage records, which incorporate regulation of flood peaks since the 1950s, reduction of tributary sediment sources to the Pecos River, and the amount of sediment being trapped in upstream reservoirs (Reclamation 2008). Additionally, a no storage facilities special lease stipulation would be applied to areas within 660 horizontal feet (200 horizontal meters) of the 100-year floodplain elevation and below at both Brantley and Avalon Reservoirs.

The specific, special lease stipulations applied to meet the management objectives of Alternative C are summarized below and shown on Figure 2-5. These specific stipulations would replace and/or supplement the General Surface Use and Occupancy Requirements found in Appendix A, Section A-1 if this alternative is implemented.

- No surface occupancy within 2,640 horizontal feet (805 horizontal meters) of dam embankments, appurtenant structures, and tunnels at Brantley Dam or Avalon Dam Sites.
- Surface occupancy on a case-by-case basis for wells proposed between 2,640 horizontal feet (805 horizontal meters) and 5,280 horizontal feet (1,609 horizontal meters) of Brantley Dam Site.
- No surface occupancy within 660 horizontal feet (200 horizontal meters) of maximum water surface at Brantley Reservoir (elevation 3,263 feet [995 meters]) or Avalon Reservoir (elevation 3,190 feet [972 meters]).
- No storage facilities within 660 horizontal feet (200 horizontal meters) of the 100-year floodplain at Brantley Reservoir (elevation 3,283 feet [1,001 meters]) or Avalon Reservoir (elevation 3,200 feet [975 meters]).
- Surface occupancy on a case-by-case basis within 300 horizontal feet (91 horizontal meters) of all publicly maintained (e.g., State of New Mexico, Eddy County), designated roads and highways for construction of access roads and pipelines. No wells will be permitted within these areas.
- Surface occupancy on a case-by-case basis within 660 horizontal feet (200 horizontal meters) of normal high water line of streams, rivers, and arroyos for construction of roads and pipelines. Construction of access roads and pipelines will be restricted in high-value riparian and sensitive areas along streams, rivers, and arroyos. No wells will be permitted within these areas.
- No surface occupancy within 300 horizontal feet (91 meters) of all areas leased for recreational purposes (e.g., Brantley Lake State Park and Champion Cove).
- Surface occupancy on a case-by-case basis within 500 horizontal feet (152 meters) of any improvements either owned, permitted, leased, or otherwise authorized by Reclamation within the leased areas for construction of access roads and pipelines. No wells will be permitted in these areas.
- No surface occupancy within 200 horizontal feet (61 meters) of all designated, improved, and permitted trails.

- Surface occupancy on a case-by-case basis within 200 horizontal feet (61 meters) of established crops for the construction of access roads and pipelines. No wells will be permitted within these areas.
- Surface occupancy on a case-by-case basis within slopes steeper than 2:1 and within 200 horizontal feet (61 meters) of slopes steeper than 2:1 for the construction of access roads and pipelines. No wells will be permitted within these areas.
- Surface occupancy on a case-by-case basis within established right-of-ways of human-made canals, laterals, aqueducts, pipelines, or drainages for the construction of access roads and pipelines. No wells will be permitted within these areas.
- No surface occupancy within Critical or Occupied Habitat for Federally listed threatened or endangered species, and access may be restricted seasonally in other important wildlife areas.
- Surface occupancy on a case-by-case basis for the construction of wells, pipelines, roads, overhead electric distribution lines, and any other surface disturbance within the Carlsbad Irrigation District National Historic Landmark.

Alternative C incorporates legislative and regulatory requirements and/or management objectives that currently are not included under existing management (i.e., Alternative A). The amount of land open to leasing with a special lease stipulation of no surface occupancy would decrease to 19,155 acres (7,752 hectares), or 39 percent of the Project Area as compared to Alternative A. The amount of land open to leasing with a special lease stipulation of no storage facilities would decrease to 6,486 acres (2,625 hectares), or 13 percent of the Project Area as compared to Alternative A. The amount of land that could be leased with standard lease terms and conditions would decrease to 10,324 acres (4,178 hectares), or 21 percent of the Project Area as compared to Alternative A. The amount of land designated for surface occupancy on a case-by-case basis, but with no wells allowed, would increase to 13,527 acres (5,474 hectares) or 27 percent of the Project Area compared to Alternatives A and B.

Alternative C allows for implementing the least-restrictive constraints that would provide adequate resource protection while allowing mineral leasing and development to occur. Alternative C consolidates the requirements and objectives at the programmatic level, which would clarify the leasing process for industry, Reclamation, and BLM, and would streamline the NEPA process for site-specific actions. As with Alternative A, impacts on resources of concern, as described in Chapter 3, are not anticipated to be significant under Alternative C with implementation of conditions of approval and other requirements.

The amount of land closed to well development in Alternative C would likely limit the spatial area in which to explore for and develop fluid minerals in certain locales, though not to the

extent anticipated under Alternative B. This could reduce the opportunity and/or increase the cost for oil and gas development activities in the Project Area.

## 2.4 SUMMARY OF IMPACTS BY ALTERNATIVE

Table 2-7 provides a summary of the Project Area resources analyzed, the anticipated resource impacts of each alternative, and the reasoning used to analyze the resources and determine consequences. For a complete description of the anticipated impacts to Project Area resources, see Chapter 4: Environmental Consequences.

**Table 2-7. Summary of Impacts by Alternative.**

<b>RESOURCES ANALYZED</b>	<b>ALTERNATIVE A: 2003 RMP WITH OLD OIL AND GAS LEASING STIPULATIONS AND OLD MAXIMUM CONSERVATION POOL ELEVATION</b>	<b>ALTERNATIVE B: 2003 RMP WITH NEW OIL AND GAS LEASING STIPULATIONS AND OLD MAXIMUM CONSERVATION POOL ELEVATION</b>	<b>ALTERNATIVE C: 2003 RMP WITH NEW OIL AND GAS LEASING STIPULATIONS AND NEW MAXIMUM CONSERVATION POOL ELEVATION</b>
Air Quality	200–300 acres of new surface disturbance over 20 years.	100–200 acres of new surface disturbance over 20 years; between 50% and 67% less new indirect impacts to air quality than Alternative A.	300–400 acres of new surface disturbance over 20 years; between 50% and 100% more new indirect impacts to air quality than Alternative A.
Soils	200–300 acres of new surface disturbance over 20 years.	100–200 acres of new surface disturbance over 20 years; between 50% and 67% less new direct impacts to soils than Alternative A.	300–400 acres of new surface disturbance over 20 years; between 50% and 100% more new direct impacts to soils than Alternative A.
Cave and Karst Resources	200–300 acres of new surface disturbance over 20 years; impacts unlikely due to implementation of guidelines in Appendix A-3.	100–200 acres of new surface disturbance over 20 years; impacts unlikely due to implementation of guidelines in Appendix A-3.	300–400 acres of new surface disturbance over 20 years; impacts unlikely due to implementation of guidelines in Appendix A-3.
Water Quality	200–300 acres of new surface disturbance over 20 years.	100–200 acres of new surface disturbance over 20 years; between 50% and 67% less new indirect impacts to water quality than Alternative A.	300–400 acres of new surface disturbance over 20 years; between 50% and 100% more new indirect impacts to water quality than Alternative A.
Vegetation	40–90 acres of net vegetation disturbance over 20 years.	0–40 acres of net vegetation disturbance over 20 years; between 45% and 100% less net direct impacts to vegetation than Alternative A.	90–140 acres of net vegetation disturbance over 20 years; between 125% and 250% more net direct impacts to vegetation than Alternative A.

Table 2-7. (Cont.)

RESOURCES ANALYZED	ALTERNATIVE A: 2003 RMP WITH OLD OIL AND GAS LEASING STIPULATIONS AND OLD MAXIMUM CONSERVATION POOL ELEVATION	ALTERNATIVE B: 2003 RMP WITH NEW OIL AND GAS LEASING STIPULATIONS AND OLD MAXIMUM CONSERVATION POOL ELEVATION	ALTERNATIVE C: 2003 RMP WITH NEW OIL AND GAS LEASING STIPULATIONS AND NEW MAXIMUM CONSERVATION POOL ELEVATION
Wildlife	No Surface Occupancy on 25,808 acres (52%) of Project Area land, leaving 13,704 acres open to oil and gas development subject to standard lease stipulations; 200–300 acres of new surface disturbance over 20 years.	No Surface Occupancy on 40,478 acres (82%) of Project Area land, leaving 8,057 acres open to oil and gas development subject to standard lease stipulations; 100–200 acres of new surface disturbance over 20 years.	No Surface Occupancy on 19,155 acres (39%) of Project Area land, leaving 10,324 acres open to oil and gas development subject to standard lease stipulations; 300–400 acres of new surface disturbance over 20 years.
Fisheries	No Surface Occupancy on 25,808 acres (52%) of Project Area land, leaving 13,704 acres open to oil and gas development subject to standard lease stipulations; 200–300 acres of new surface disturbance over 20 years.	No Surface Occupancy on 40,478 acres (82%) of Project Area land, leaving 8,057 acres open to oil and gas development subject to standard lease stipulations; 100–200 acres of new surface disturbance over 20 years.	No Surface Occupancy on 19,155 acres (39%) of Project Area land, leaving 10,324 acres open to oil and gas development subject to standard lease stipulations; 300–400 acres of new surface disturbance over 20 years.
Threatened, Endangered, and Other Special Status Species	No Surface Occupancy on 25,808 acres (52%) of Project Area land, leaving 13,704 acres open to oil and gas development subject to standard lease stipulations; 200–300 acres of new surface disturbance over 20 years.	No Surface Occupancy on 40,478 acres (82%) of Project Area land, leaving 8,057 acres open to oil and gas development subject to standard lease stipulations; 100–200 acres of new surface disturbance over 20 years.	No Surface Occupancy on 19,155 acres (39%) of Project Area land, leaving 10,324 acres open to oil and gas development subject to standard lease stipulations; 300–400 acres of new surface disturbance over 20 years.
Cultural Resources	200–300 acres of new surface disturbance over 20 years.	100–200 acres of new surface disturbance over 20 years; between 50% and 67% less new impacts to cultural resources than Alternative A.	300–400 acres of new surface disturbance over 20 years; between 50% and 100% more new impacts to cultural resources than Alternative A.
Indian Trusts Assets (ITAs)	No effects.	No effects.	No effects.
Paleontological Resources	200–300 acres of new surface disturbance over 20 years.	100–200 acres of new surface disturbance over 20 years; between 50% and 67% less new impacts to paleontological resources than Alternative A.	300–400 acres of new surface disturbance over 20 years; between 50% and 100% more new impacts to paleontological resources than Alternative A.
Social and Economic Values	Between 40 and 60 new wells would be drilled over 20 years.	Between 20 and 40 new wells would be drilled over 20 years; between 50% and 67% less new wells than Alternative A.	Between 60 and 80 new wells would be drilled over 20 years; between 50% and 100% more new wells than Alternative A.

Table 2-7. (Cont.)

RESOURCES ANALYZED	ALTERNATIVE A: 2003 RMP WITH OLD OIL AND GAS LEASING STIPULATIONS AND OLD MAXIMUM CONSERVATION POOL ELEVATION	ALTERNATIVE B: 2003 RMP WITH NEW OIL AND GAS LEASING STIPULATIONS AND OLD MAXIMUM CONSERVATION POOL ELEVATION	ALTERNATIVE C: 2003 RMP WITH NEW OIL AND GAS LEASING STIPULATIONS AND NEW MAXIMUM CONSERVATION POOL ELEVATION
Environmental Justice	No effects.	No effects.	No effects.
Recreation Resources	Between 40 and 60 new wells would be drilled over 20 years.	Between 20 and 40 new wells would be drilled over 20 years; between 50% and 67% less new wells than Alternative A.	Between 60 and 80 new wells would be drilled over 20 years; between 50% and 100% more new wells than Alternative A.
Rangeland and Grazing	200–300 acres of new surface disturbance over 20 years.	100–200 acres of new surface disturbance over 20 years.	300–400 acres of new surface disturbance over 20 years.
Energy, Minerals, and Other Extractive Resources	Approximately 2 to 3 wells drilled per year (40 to 60 wells over 20 years) and approximately 2 wells per year plugged and abandoned; No Surface Occupancy on 25,808 acres (52%) of Project Area land, leaving 13,704 acres open to oil and gas development subject to standard lease stipulations; estimated 200–300 acres of surface disturbance.	Approximately 1 to 2 wells drilled per year (20 to 40 wells over 20 years) and approximately 2 wells per year plugged and abandoned; No Surface Occupancy on 40,478 acres (82%) of Project Area land, leaving 8,057 acres open to oil and gas development subject to standard lease stipulations; estimated 100–200 acres of surface disturbance.	Approximately 3 to 4 wells drilled per year (60 to 80 wells over 20 years) and approximately 2 wells per year plugged and abandoned; No Surface Occupancy on 19,155 acres (39%) of Project Area land, leaving 10,324 acres open to oil and gas development subject to standard lease stipulations; estimated 300–400 acres of surface disturbance.
Transportation and Access	Approximately 2 to 3 wells drilled per year (40 to 60 wells over 20 years) and approximately 2 wells per year plugged and abandoned; estimated 200–300 acres of surface disturbance.	Approximately 1 to 2 wells drilled per year (20 to 40 wells over 20 years) and approximately 2 wells per year plugged and abandoned; estimated 100–200 acres of surface disturbance.	Approximately 3 to 4 wells drilled per year (60 to 80 wells over 20 years) and approximately 2 wells per year plugged and abandoned; estimated 300–400 acres of surface disturbance.
Visual Resources	200–300 acres of new surface disturbance over 20 years.	100–200 acres of new surface disturbance over 20 years; between 50% and 67% less new impacts to visual resources than Alternative A.	300–400 acres of new surface disturbance over 20 years; between 50% and 100% more new impacts to visual resources than Alternative A.

## 2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

Reclamation considered one alternative that was not analyzed in detail. This alternative would have reinstated oil and gas leasing stipulations that existed prior to the adoption of the 2003 RMP. Because this alternative would result in actions detrimental to a number of sensitive

resources within the Study Area, and considering that this alternative was analyzed as Alternative A in the 2003 RMP Final EA, it was dropped from further analysis.

## **2.6 REASONABLE FORESEEABLE MINERALS DEVELOPMENT**

This section provides a summary of the exploration history, current lease status, and the 20-year projections for reasonable foreseeable development (RFD) in the Project Area. The RFD is a projection of the Federal minerals actions and activities, including development, that are likely to occur in the Project Area over the life of the RMPA (i.e., 20 years). Attention is focused on projecting Federal minerals leasing, exploration, development, production, and abandonment activities likely to occur on land managed by the Federal government within the Project Area. This projection includes the number, density, and type of wells likely to be drilled and the surface use requirements to project the amount of surface disturbance.

### **2.6.1 Exploration History**

Well data for the Project Area, obtained from the BLM, indicates that the first well was drilled in 1926 and the oldest active well dates back to approximately 1938. To date, 330 wells have been drilled in the Project Area. A summary of current well information is provided in Table 2-8. Of the 330 wells, 188 (57 percent) are in operation, 3 (1 percent) are suspended, 10 (3 percent) are temporarily abandoned, and 25 (8 percent) are permanently abandoned. There are also approximately 104 wells (31 percent) within the Project Area that are dry, junked, service, or location only.

**Table 2-8. Status of Oil and Gas Wells in the Project Area (2009).**

<b>WELL TYPE AND STATUS</b>	<b>NUMBER</b>
Active Gas Well	141
Active Oil Well	47
Dry Well	61
Dry Hole with Show of Gas	16
Dry Hole with Show of Oil	19
Suspended Oil Well	3
Temporarily Abandoned Well	10
Permanently Abandoned Well	25
Junked Well	3
Service Well	3
Location Only	2
<b>Total Wells</b>	<b>330</b>

## **2.6.2 Development Projections**

Using the past 83 years of data to determine the average rate of drilling, approximately 4.0 wells per year were drilled within the Project Area. Given a planning period of 20 years, one might project that 80 wells would be drilled within the Project Area during that time. Another scenario might be to assume that the next 20 years would be similar to the most active 10-year period for the Project Area, which was the decade from 1973 to 1982 with 77 wells drilled (or 7.7 wells per year). Conversely, another scenario might be to assume that the next 20 years would be similar to the least active 10-year period for the Project Area, which was the decade from 1987 to 1996 with 25 wells drilled (or 2.5 wells per year). Therefore, the potential RFD could range from 50 to 150 wells drilled on Reclamation lands over the 20-year planning period. The RFD does not imply any drilling restrictions or limitations; it is simply a forecast of anticipated activity based on history. The actual number of wells drilled would vary from year to year.

## **2.6.3 Surface Disturbance Assumptions**

The assumptions for surface disturbance from access roads, drill pads, pipelines, power lines, and seismic activity were derived from Appendix 7 of the Special Status Species Proposed Resource Management Plan Amendment/Final EIS (BLM 2007).

The following surface disturbance assumptions were used to estimate impacts associated with oil and gas exploration and development drilling activities within the Project Area:

- Stabilization of surface disturbance is expected to occur within 3 years.
- Access Roads: 14-foot (4-meter)-wide travel way, 1.5 acres (0.6 hectare) of initial disturbance per access road (0.75 acre [0.03 hectare] of disturbance stabilized per access road) per well.
- Drill Pads: 1.4 acres (0.6 hectare) of disturbance per average well pad (i.e., 250 feet by 250 feet [76 meters by 76 meters]), 1.0 acre (0.4 hectare) stabilized per abandoned well.
- Pipelines: 1.6 acres (0.6 hectare) initial disturbance per producing well (i.e., 30-foot [9-meter] right-of-way width), 0.75 acre (0.03 hectare) stabilized per producing well, 0.5 acre (0.2 hectare) stabilized per abandoned producing well.
- Power Lines: 0.5 acre (0.2 hectare) initial disturbance per producing well, 0.25 acre (0.10 hectare) stabilized per well.
- Geophysical Lines: 1.0 acre (0.4 hectare) of disturbance per mile (1.6 kilometer) of geophysical line. Reclamation of disturbance is expected to occur within 3 to 5 years.

An average of 5.0 acres (2.0 hectares) per well was used to determine initial (i.e., short-term) surface disturbance in Chapter 4 discussions in this EA. This is a total acreage value and includes initial surface disturbance from roads, pipeline, power lines, and other activities associated with exploration and development of oil and gas resources. An average of 2.5 acres (1.0 hectare) per well was used to determine stabilized (i.e., long-term) surface disturbance of active wells in Chapter 4 discussions.

#### **2.6.4 Development Estimates**

The RFD history indicates that approximately two to eight wells have been drilled per year and that up to two wells per year have been plugged and abandoned, on average, in the Project Area. Direct impacts included surface disturbances of approximately 10 to 40 acres (4 to 16 hectares), of which approximately 5 to 20 acres (2 to 8 hectares) would have been reclaimed and stabilized by the end of 3 years. Successful reclamation and stabilization of the plugged and abandoned wells would have totaled approximately 3 acres (1 hectare) per year.

Over the next 20 years the RFD projects that between 40 and 150 wells would likely be drilled in the Project Area, and up to 40 wells would likely be plugged and abandoned. During that period approximately 200 to 750 acres (81 to 303 hectares) of surface area would be disturbed, while approximately 100 to 375 acres (40 to 152 hectares) would be reclaimed and stabilized within three years of the initial disturbance. Approximately 60 acres (24 hectares) would be reclaimed and stabilized from plugged and abandoned wells over the next 20-year planning period.

Table 2-9 provides a more accurate summary of the estimated number of wells drilled within the Project Area for each alternative over the next 20 years, including the amount of area disturbed by these activities. The estimated number of wells drilled per year over the next 20 years was determined by evaluating potential well locations based on proposed drilling restrictions (e.g., no surface occupancy areas, well spacing) for each of the three alternatives. Because of the relatively small geographic extent of the Project Area and over 85 years of oil and gas development history, the remaining area available for new wells will limit the number of wells that could be developed in the future compared with the past.

## **2.7 ALTERNATIVE ENERGY DEVELOPMENT**

Neither Reclamation's 2003 RMP nor BLM's 1988 RMP address alternative (e.g., solar, wind, geothermal) energy development within the Project Area. Current agency policy regarding solar energy development is to facilitate environmentally responsible commercial development of solar energy projects. Commercial concentrated solar power or photo-voltaic generating facilities must, however, comply with Reclamation and BLM planning, environmental, and current right-of-way application requirements, as do other similar uses.

**Table 2-9. Summary of Surface Disturbance from Oil and Gas Development by Alternative.**

<b>ALTERNATIVE</b>	<b>ESTIMATED NUMBER OF WELLS DRILLED PER YEAR</b>	<b>ESTIMATED NUMBER OF ACRES DIRECTLY IMPACTED PER YEAR</b>	<b>ESTIMATED NUMBER OF WELLS DRILLED OVER 20 YEARS</b>	<b>ESTIMATED NUMBER OF ACRES DIRECTLY IMPACTED OVER 20 YEARS</b>	<b>ESTIMATED NUMBER OF ACRES RECLAIMED AND STABILIZED OVER 20 YEARS (INCLUDES ABANDONED WELLS)</b>
Alternative A	2 to 3	10 to 15 (4 to 6 hectares)	40 to 60	200 to 300 (81 to 121 hectares)	160 to 210 (65 to 85 hectares)
Alternative B	1 to 2	5 to 10 (2 to 4 hectares)	20 to 40	100 to 200 (41 to 81 hectares)	110 to 160 (45 to 65 hectares)
Alternative C	3 to 4	15 to 20 (6 to 8 hectares)	60 to 80	300 to 400 (121 to 162 hectares)	210 to 260 (85 to 105 hectares)

The 2005 Wind Energy Development on BLM-administered Lands in the Western United States Programmatic EIS (BLM 2005) evaluated the potential impacts associated with the proposed action to develop a Wind Energy Development Program, including the adoption of policies and BMPs. Similarly, the 2008 Geothermal Leasing in the Western United States Programmatic EIS (BLM 2008) will evaluate the potential impacts associated with the proposed action to facilitate geothermal leasing decisions on existing and future lease applications and nominations to the Federal mineral estate. These programmatic EISs amend existing BLM land use plans to address wind and geothermal energy development proposals, respectively.

As programmatic evaluations, the wind and geothermal EISs do not evaluate site-specific issues associated with individual development projects. A variety of location-specific factors and variations in project size and design would determine the magnitude of the impacts from individual projects. Therefore, based on current land use plans and policy guidance, any proposals to locate either solar, wind, or geothermal energy generating facilities within the Project Area would be evaluated on a case-by-case basis using the assessment criteria in current RMP documents for similar uses. A discussion of alternative energy potential in the Project Area can be found in Chapter 3.

