Chapter 5
Affected Environment and Environmental Consequences

Introduction

This chapter describes the existing physical and biological resources and environmental factors in the study area (affected environment) and the effects of the alternatives on certain resources and environmental factors (environmental consequences). Resources include surface water and ground water, vegetation and wildlife, special status species, recreation, soils, air quality, visual quality, cultural resources, and Indian trust assets. Environmental factors include climate, topography, geology, land use, regional economy, transportation, and environmental justice. All resources and factors within the study area are described in the affected environment section; however, only those resources and factors that could be affected by the alternatives are analyzed in the environmental consequences section.

The No Action Alternative, which provides the basis of comparison for the effects of the three action alternatives, describes conditions in the future if no action were implemented. The analysis of the potential effects of the alternatives on resources is based on the professional judgment and experience of Reclamation staff specialists, their discussions with other experts and professionals, literature review, and field reviews of the study area. The depth of the analyses corresponds to the scope and magnitude of the potential effects of the alternatives. If an alternative could adversely affect a resource, appropriate mitigation measures are presented.

The goal of this chapter is to quantify, to the extent possible, the effects of each alternative on the resources and environmental factors. However, if quantitative estimates were not possible, qualitative estimates are provided.

Climate

The Coachella Valley is one of the hottest, driest areas in the United States. The San Bernardino, San Jacinto, and Santa Rosa Mountains isolate the Coachella Valley from the moist, cool ocean air masses from the west. As a result, the region is characterized by a subtropical desert climate with long, hot, dry summers and relatively short, mild winters. Mean annual rainfall ranges from 4 to 6 inches per year and mostly occurs as gentle widespread rains from

November through March. Localized thunderstorms from August through October can produce short-duration, high-intensity rainfall that may result in flash flooding. Temperature extremes range between 28 to 126 degrees Fahrenheit (°F). The humidity ranges from about 34 percent in the summer to about 48 percent in the winter (National Oceanic and Atmospheric Administration [NOAA], 2004).

Gusty winds can produce severe and widespread dust storms. Summer thunderstorms often produce high wind gusts. The winds pick up large amounts of natural desert soils that can be transported over large distances. The prevailing wind direction, as measured at the NOAA climatological monitoring station at Thermal Airport, is predominantly from the northwest. The annual mean wind speed is 8.1 miles per hour. Conditions are calm only about 2 percent of the time.

None of the alternatives would affect climate.

Topography

The study area is located in the northern end of a trough that includes the Imperial, Mexicali, and Coachella Valleys. The Imperial Valley, located on the border of California and Mexico, also known as the Salton Sink, the Salton Basin, and the Salton Trough, is actually an extension of the Gulf of California, although today it is cut off from the gulf by the Colorado River's delta fan. The area south of the border is known as the Mexicali Valley. The Coachella Valley is located on the north side of the Salton Sea in a lowland that is part of the Basin and Range province.

The well-known San Andreas Fault cuts diagonally across the region and forms the mountains on the northeast side of the Salton Basin. The San Jacinto and Santa Rosa Mountains are located to the west, the San Bernardino Mountains are located to the north, and the Little San Bernardino Mountains and Chocolate Mountains are located to the northeast and to the southeast side of the Coachella Valley.

In prehistoric times, the Colorado River was much larger than it is today, and it carried millions of tons of silt and sediment into the Gulf of California. During heavy spring runoff, the river flooded its delta and siltation clogged old channels, forcing the river to find new routes to the gulf. Each time the river broke through natural levees, water drained into the Mexicali Valley and slowly filled the basin, forming ancient Lake Cahuilla. Lake Cahuilla was created and disappeared as many as five times during its last 2,500 years, each occurrence lasting from 100 to 700 years. The lake measured 115 miles long by 34 miles, was 315 feet deep, and stretched from north of the location of the modern-day city of Indio, California, south into Mexico. Occasionally, the Colorado River water was diverted, and the entire flow was captured by the Salton Basin. Carbon-14 dating indicates the last

lake period occurred about 500 to 700 years ago. After the Colorado River ceased to flow into the Salton Basin and began to flow into the Gulf of California, Lake Cahuilla evaporated. When the first Spaniards entered the region in about 1539, the floor of the Salton Trough was a dry salt flat. The original Salton Sea was formed during the period 1905–07 by floodflow of the Colorado River. It currently serves as a drainage reservoir for irrigation return water and storm water.

Evidence of the prehistoric shoreline of Lake Cahuilla appears in many parts of the Salton Basin. Prominent beach terraces developed because of wave action and nearby shore currents. These terraces appear as long, steep-sided, flat ridges that are littered with water-worn pebbles and cobbles. Portions of the ancient shoreline are visible as dark stains at the base of the Santa Rosa Mountains south of Lake Cahuilla County Park.

None of the alternatives would affect the topography.

Geology

Geologic deposits in the study area are composed of unconsolidated deposits, partly consolidated deposits, and consolidated rocks (surrounding mountains) (**map 5.1, Coachella Canal Area Geology**). The unconsolidated deposits are the main water-bearing aquifers. The partly consolidated deposits that formed the Indio, Mecca, and Garnett Hills, of late Pleistocene and Holocene age, have low permeability and poor aquifer characteristics. The consolidated rocks are undifferentiated granitic intrusive and metamorphic rocks of Precambrian and Tertiary age that contain little or no water.

The Coachella Valley is in an area that lies along a section of the San Andreas Fault, an area of high seismic activity. On April 22, 1992, an earthquake with a magnitude of 6.1 occurred near the community of Desert Hot Springs. Minor damage to structures in the community was reported, but there was no damage to water facilities in the area. On June 28, 1992, another earthquake with a magnitude of 7.4 occurred (was centered) near the community of Yucca Valley, approximately 17 miles northeast of Palm Springs. The Coachella Valley Water District reported that this earthquake caused approximately 20 leaks in underground concrete lateral pipes that temporarily affected about 8,000 acres of irrigated land.

None of the alternatives would affect geology.

Surface Water and Ground Water

Surface water in the study area is limited to those periods of floodflows that do not directly affect the management of study area lands. Ground water is pumped and used for irrigation within the Coachella Valley. Ground water supplies currently are overdrawn, and this condition is expected to continue in the near future. Ground water recharge is required by the California Department of Water Resources.

Affected Environment

Surface Water

The principal stream in the Coachella Valley is the Whitewater River, which originates on the slopes of Mount San Gorgonio and flows southeast into the Salton Sea. The river serves as a path to drain both natural surface water and irrigation water in the lower Coachella Valley.

The principal tributaries of the Whitewater River are the San Gorgonio River and the Snow, Chino Canyon, Tahquitz, Palm Canyon, Deep Canyon, Mission, Big Morongo, and Little Morongo Creeks. Some of the larger tributaries are perennial streams in the mountains, but quickly percolate into the ground water supply upon reaching the highly pervious alluvium of the Coachella Valley.

The United States Geological Survey (USGS) has gauges on the Whitewater River in California at Windy Point; Snow Creek near White Water; Chino Canyon Creek near Palm Springs; Deep Canyon Creek near Palm Desert; Whitewater River at Indio; Whitewater River near Mecca; Mission Creek near Desert Hot Springs; Tahquitz Creek near Palm Springs; and Andreas Creek near Palm Springs.

Normally, surface discharges of the streams flowing in the Coachella Valley infiltrate into the alluvium and become part of the ground water supply. Only during periods of floodflow does surface runoff reach the Salton Sea.

There is the potential for high surface runoff and flash flooding from localized storms, which may occur any time during the year; however, storms are more frequent during the late summer months. To protect the Coachella Canal and adjacent lands from the damaging effects of surface runoff, a series of dikes were constructed in high risk areas. These dikes intercept the runoff, pond the water, and allow it to stand until it either evaporates or infiltrates into the ground water supply.

Coachella Canal Area Geology

August 2006

LEGEND

City Boundary

Land Ownership

Bureau of Reclamation

Formation

- MEZOZOIC -- PLUTONIC ROCK
- PALEOZOIC - MEZOZOIC -- MIXED ROCK
- PRECAMBRIAN - PALEOZOIC -- PLUTONIC ROCK
- PRECAMBRIAN -- MARINE SEDIMENTARY ROCK
- PRECAMBRIAN -- MIXED ROCK
- QUATERNARY -- CONTINENTIAL SEDIMENTARY ROCK
- QUATERNARY -- SEDIMENTARY ROCK
- QUATERNARY -- VOLCANIC ROCK

This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Map 5.1

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RECLAMATION
Managing Water in the West

Produced by the Bureau of Reclamation
Remote Sensing and GIS Group
Denver Technical Service Center - Denver, CO

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BUREAU OF RECLAMATION

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T7S R8E
T7S R9E
T7S R10E

Palm Desert Country
Bermuda Dunes
Indio
Indian Wells
La Quinta
Coachella
Mecca

End of Study Area
End of Study Area

Surface Water Quality

Surface water flow in the study area is limited to the Coachella Canal channel and the Whitewater River storm water channel. Because the canal is concrete lined, seepage losses are insignificant. No wetlands are currently known to exist on Reclamation lands. A minor portion of the floodflows is recharged to the aquifer system in the Coachella Valley area.

Ground Water

The hydrogeology of the Coachella Valley is controlled by about 3,280 feet of unconsolidated deposits. The ground water in the alluvium is compartmentalized by several faults that influence ground water flow. Most ground water moves southeast in the Coachella Valley. Ground water flow generally follows the gradient of the land surface but may be affected by pumping depressions and local geology of the non-water-bearing rocks. Ground water is principally stored in the unconsolidated sediment deposits.

The transmissibility of an aquifer is the rate of flow of water in gallons per day through a vertical strip of the aquifer, 1 foot wide, extending the full saturated thickness of the aquifer under a hydraulic gradient of unity. Transmissibility in the Coachella Valley is generally high, and some sites are very permeable. The transmissibility generally ranges from 2,000 gallons per day per foot to 10,000 gallons per day per foot (Mallory et al., 1984). In the Garnet Hill subbasin, transmissibility ranges from 10,000 to 50,000 gallons per day per foot. The maximum transmissibility computed using a pump test was 880,000 gallons per day per foot near the head of the Coachella Canal on the East Mesa.

An estimated 10,000 acre-feet of subsurface flows reach the Salton Sea annually. Storage capacity of the ground water basin is estimated at 7,000,000 acre-feet, with a safe yield of 22,000 acre-feet per year.

Ground water beneath Reclamation lands is a source of water for mitigation related to the Coachella Canal lining project.

Ground Water Discharge and Recharge

The main source of ground water discharge is from wells used to irrigate the cultivated part of the Coachella Valley. Some water is also discharged through numerous small springs and seeps. Runoff from the higher mountain elevation is the main source of natural recharge in the Coachella Valley. Small amounts of precipitation percolate to the ground water. Recharge by underflow from all tributaries is small compared to artificial recharge using imported Colorado River water through a conjunctive use agreement with the Metropolitan Water District (MWD) (MWD Web site <www.mwdh2o.com/mwdh2o/pages/yourwater/supply/conjunctive/cuse01.html>). This conjunctive use agreement

allows MWD to either store water in advance of actual use or substitute the CVWD State Water Project allotments for Colorado River water allocated to MWD.

Artificial Ground Water Recharge From 1936–74, ground water levels declined more than 100 feet in the Palm Springs area. CVWD is currently using water from the Colorado River to help retard this trend of water level decline. Artificial recharge plays an important role in conjunctive use; surface water use is supplemented by ground water use.

The ground water basin of the Upper Coachella Valley contains two subbasins (Mission Creek and Desert Hot Springs) that are geologically suitable for large-scale artificial recharge. The two subbasins are located northwest of the Salton Sea. Ground water storage capacity of the Mission Creek subbasin is estimated to be 2.6 million acre-feet (California Department of Water Resources [CDWR], 1964), with current storage estimated at 1.4 million acre-feet (CVWD, 2000). Ground water storage capacity of the Desert Hot Springs subbasin is estimated to be 4.1 million acre-feet (CDWR, 1964). Recharge rates of 5 feet per day may be feasible for use on spreading grounds if sediment and bacterial clogging can be controlled.

From 1973–88, approximately 1 million acre-feet of imported water was artificially recharged (Levy, 1988). The people in the Coachella Valley are taking advantage of the natural storage capacity of the aquifer to store water during periods of excess for use during drought periods.

Ground Water Quality It is difficult to set numerical objectives for the ground water in the Coachella Valley. The quality of ground water varies greatly with depth of well perforations, current water level, geology, hydrology, and several other factors. About 60 to 70 percent of pumped ground water used for irrigation is consumed by crops.

Ground water in the Mission Creek subbasin ranges from a calcium-magnesium bicarbonate type in the northwest to a sodium chloride-sulfate type in the southeast.

Chemical analyses performed from 1968–74 show that sodium chloride-sulfate type ground water exists throughout the Desert Hot Springs subbasin. High concentrations of dissolved solids occur in the ground water throughout this subbasin, limiting agricultural or domestic use (CVWD, 2000). Ground water temperatures in hot water wells near the city of Desert Hot Springs in the subbasin along the Mission Creek Fault are an average of 118 ^{o}F (CDWR, 1964).

Recent data indicate that mineral content of a number of ground water basins in this region may be increasing.

Perchlorate[1] has been identified as a contaminant in the Colorado River (Hogue, 2003), and the use of Colorado River water has been identified as a source of ground water contamination in the Coachella Valley (EPA, 2005; CVWD, 2002). The source of the perchlorate is a former production facility in Henderson, Nevada (Hogue, 2003; CVWD, 2001). Water from waste ponds seeped into the ground water at the site. Contaminated ground water then moved through a buried river channel to Las Vegas Wash and into Lake Mead (Hogue, 2003; CVWD, 2001). Currently, the contaminated ground water is intercepted, and the perchlorate is removed before it reaches Lake Mead. In 1997, prior to the cleanup at the site, an estimated 900 pounds per day of perchlorate entered Lake Mead from Las Vegas Wash; this was reduced to an estimated 500 pounds per day by 2001 (Mayer, 2004). Table 5.1 shows a summary of monitoring data for 2002 and 2004 at five key points in the Colorado River. As shown, the concentrations of perchlorate have decreased considerably over the 2-year period, despite drought conditions in the basin. The goal of the treatment program in Las Vegas Wash is to reduce the perchlorate discharge to Lake Mead to less than 50 pounds per day.

Table 5.1 – Lower Colorado River 2002 and 2004 average perchlorate concentrations (ppb)

Location	2002	2004
Las Vegas Wash	500	150
Lake Mead	10	7
Hoover Dam	6	4
Parker Dam	5	< 4
Imperial Dam	5	< 4

Source: Mayer, 2004.

Drinking water in the Coachella Valley is entirely provided from ground water. Perchlorate in the Cove Communities of the Coachella Valley was observed between the detection limit (4 parts per billion [ppb]) and 5.4 ppb in 2001 and to 5.6 ppb in 2002 (CVWD, 2001; CVWD, 2002). The sources listed by CVWD (2002) were discharge of rocket fuel (Colorado River water) and fertilizer. Many fertilizers have been shown to contain perchlorate (Susarla, 1999; Orris et al., 2003), but the greatest concentration of perchlorate is associated with those from potash-bearing evaporite sources (Orris et al., 2003).

There is no drinking water standard for perchlorate, but EPA has established a reference dose (EPA 2005). The State of California has established a notification

[1] Perchlorate is a naturally occurring and manmade chemical. Most of the perchlorate manufactured in the United States is used as the primary ingredient of solid rocket propellant. In recent years, there has been increasing interest in perchlorate levels in soil, ground water, drinking water, and irrigation water. At high doses, perchlorate can interfere with iodide uptake into the thyroid gland (U.S. Food and Drug Administration, 2006).

level of 6 ppb CDHS (2005). None of the samples from ground water sources used by CVWD have exceeded the State notification level for perchlorate.

Environmental Consequences

Alternative A

Surface and ground water quantity and quality would not be affected under the No Action Alternative; however, upslope or surrounding development (additional wells) could slightly affect the water quantity and quality. Because perchlorate concentrations have been decreasing in the Colorado River, concentrations in crops irrigated with that water would be expected to decrease as well in the future.

Alternative B

Impacts would be the same as under Alternative A, with the possibility of slightly better water quality if damaged and degraded habitat were rehabilitated. Because perchlorate concentrations have been decreasing in the Colorado River, concentrations in crops irrigated with that water would be expected to decrease as well in the future.

Alternative C

High-intensity development, including additional wells, could moderately affect water quality and quantity. Storm runoff could result in greater water pollution. Because perchlorate concentrations have been decreasing in the Colorado River, concentrations in crops irrigated with that water would be expected to decrease as well in the future.

Alternative D

Under Alternative D, study area parcels would not be affected; however, upslope or surrounding development (additional wells) could slightly affect water quantity and quality. These adverse effects could be offset by slightly better water quality if damaged and degraded habitat were rehabilitated. Because the perchlorate concentrations have been decreasing in the Colorado River, concentrations in crops irrigated with that water would be expected to decrease as well in the future.

Mitigation

Prior to implementing a proposed project, proponent will prepare and have a storm water pollution prevention plan (SWPPP) onsite to prevent and/or minimize a spill or storm event impacting the project vicinity.

Residual Impacts

No residual impacts have been identified.

Land Use

As discussed in chapter 1, the Coachella Valley encompasses approximately 200,000 acres under various ownerships within Riverside County, California. Reclamation lands within the study area total 3,990 acres, while approximately 35,000 acres are under the jurisdiction of BLM and BIA. The State of California administers about 5,000 acres. The remaining 156,000 acres are county, city or private lands. (**See map 5.2, Coachella Canal Area Land Use – Land Cover**.) Approximately 43 percent of the land in the Coachella Valley is privately owned. As discussed in chapter 2, the remaining lands are managed by various Federal, State, and local government entities.

Affected Environment

All the land parcels within the study area administered by Reclamation were obtained for the purpose of developing and protecting the canal and related facilities. This section provides a discussion of both the Reclamation administered lands as well as land use on adjacent lands that may affect the study area. (**Photographs 5.1 and 5.2** show development in the study area.)

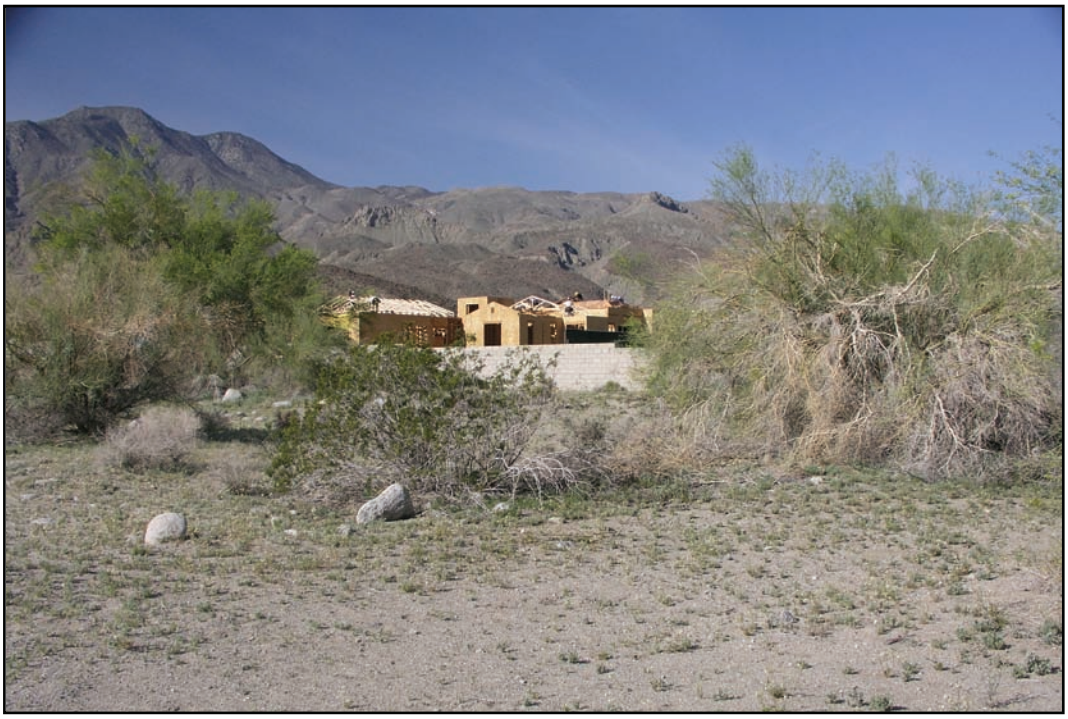
Coachella Canal Area Lands

Almost all Coachella Canal Area lands are currently operated and managed by the Coachella Valley Water District, Riverside County, or Coachella Valley Recreation and Park District through contractual agreements with Reclamation.

All of the Coachella Canal, the associated protective works, and water delivery systems within the area addressed by this RMP are transferred works (i.e., transferred by Reclamation to CVWD for care, operation, maintenance, and replacement). By virtue of Reclamation's authorized purposes, CVWD's normal operation and management procedures and requirements are paramount to any other uses of these lands and, as such, will not be subject to modification by this plan. Any uses proposed and/or alternatives considered will, by necessity, be considered in terms of their compatibility with CVWD's operations and maintenance. There is no termination date to this operation and management agreement, and it can be expected to run in perpetuity.

The existing agreement with Riverside County is for operating a county park at Lake Cahuilla, the terminal regulating reservoir of the Coachella Canal, a facility also operated by CVWD. CVWD's normal operation of Lake Cahuilla requires

Photograph 5.1 – Shadow Lake gated community/golf course under construction near Indio.



Photograph 5.2 – Subdivision development is occurring near Reclamation lands on west side of Coachella Valley.

Coachella Canal Area
Land Use - Land Cover

August 2006

LEGEND

City Boundary

Land Ownership

Bureau of Reclamation

Land Use - Land Cover

- BARE ROCK/SAND/CLAY
- URBAN
- FOREST
- FARMLAND
- GRASSES
- OPEN WATER
- SHRUBLAND
- WOODY WETLANDS

This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Map 5.2

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RECLAMATION
Managing Water in the West

Produced by the Bureau of Reclamation
Remote Sensing and GIS Group
Denver Technical Service Center - Denver, CO

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Palm Desert Country
Bermuda Dunes
Indio
Indian Wells
La Quinta
Coachella
Mecca

End of Study Area
End of Study Area

drawdown during the weekdays and filling on weekends. However, the water level may be fluctuated at any time by CVWD or Reclamation, and they reserve the right to vary the water levels to whatever extent deemed necessary or desirable for the purposes of Project operations. Water from Lake Cahuilla is removed by pipelines and delivered to farm lands along the western side of Coachella Valley. The current contract between Reclamation and Riverside County expires on January 10, 2021.

The existing agreement with CVRPD is for Reclamation lands to be used for recreation development. CVRPD manages three separate areas on Coachella Canal Area lands for recreation. The agreement expires April 23, 2026.

The existing agreements with Riverside County and CVRPD or similar types of management or right-of-use agreements are or will be subordinate to Project purposes and needs of Reclamation and CVWD.

Through normal operations, numerous crossing agreements between Reclamation and utility companies, irrigation districts, and individuals have also been entered into over the years. Agreements currently exist for all of the following types of uses: bridges, access roads, crossing agreements, fences, power and transmission lines, telephone lines, fiber optic cables, water pipelines, and gas pipelines. Pre-existing authorized land uses will continue to be honored and protected.

Special use permits are also considered for rock collecting, archeological investigation, airports, wells, mineral exploration and extraction (including sand and gravel), surface water use or sale, and material storage. Pesticide and herbicide application on Reclamation lands requires a plan and permit.

Reclamation's Yuma Area Office has copies of all authorized conveyance documents dealing with second party use of Reclamation lands.

Adjacent Lands

The cities of Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, and Rancho Mirage lie within the Coachella Valley, near the study area. Together, their jurisdictions make up approximately 15 percent of the land base in the Coachella Valley (table 5.2). The remaining lands within the Coachella Valley are unincorporated. Land ownership is discussed in more detail below.

The Coachella Valley's primary roadway network consists of Interstate 10 and State Highways 111 and 86. Interstate 10 is an east-west four- and six-lane freeway that traverses the northern portion of the valley and accommodates local, regional, and national traffic. State Highways 111 and 86 are major intra- and inter-regional roadways that service the Coachella Valley. Cities and municipalities also maintain circulation systems consisting of a web of arterial

Table 5.2 – Municipalities within the study area

City	Acres
Cathedral City	12,526
Coachella	13,393
Desert Hot Springs	14,790
Indian Wells	9,324
Indio	16,770
La Quinta	20,289
Palm Desert	15,864
Palm Springs	60,344
Rancho Mirage	15,764

roadways built on a north-south/east-west grid pattern. Interestingly, in many locations, the region's north-south/east-west pattern of land use development and resulting road grid conflict with the region's northwest-southeast dominating topography, creating challenges for transportation planners and developers.

Over the last 10 years, growth of cities in the Coachella Valley and subsequent urban encroachment on lands within Coachella Canal Area have been tremendous. Urban encroachment on irrigation systems has both adverse and beneficial effects on agricultural production. Adverse effects include increased operating costs for irrigation systems resulting from residential and commercial subdivision encroachment. Benefits include increased farm property values resulting from urbanization adjacent to irrigation systems (John Wilkins-Wells, 2003). Irrigation districts or companies must address stormwater from residential subdivisions, trash, vandalism, trespassing, canal drownings, municipal and developer demands for canal crossings, and pressures from local governments to use canals for trails and other recreational pursuits.

In addition, the Coachella Canal itself is an important element in the region's contemporary (post-1920) history and should be recognized as an historical property. Although the canal has not been formally evaluated for potential listing on the *National Register of Historic Places* pursuant to the National Historic Preservation Act of 1966, it does have that potential. As stated previously, Reclamation, in cooperation with CVWD, reviews and approves, if appropriate, land use authorizations for the use of its lands. This approval process takes into consideration the potential effects that future land uses may have on the care, operation, maintenance, and replacement of the canal and appurtenant structures. This approval process also takes into consideration the potential historical significance of the canal itself.

Regional Context

One of the best descriptions of land uses within the Coachella Valley and surrounding mountains can be found in the *Draft Coachella Valley Multiple*

Species Habitat Conservation Plan/Natural Communities Conservation Plan (CVMSHCP/NCCP, 2005). The primary purpose of the plan is to address multiple species habitat conservation by actively engaging nine cities, a county, and numerous other agencies in the planning process. Although the boundaries of the CVMSHCP/NCCP differ from those of this study, the regional setting is similar, as both plans encompass the Coachella Valley. CVMSHCP/NCCP includes an expanded area that roughly encompasses the mountains surrounding the Coachella Valley from the valley floor to the top ridgelines. Table 5.3, taken from the CVMSHCP/NCCP, illustrates existing land uses within the Coachella Valley and surrounding mountainous areas.

Additional information concerning land ownership can also be found in the CVMSHCP/NCCP (table 5.4). As before, this information must be viewed within the context of this plan's regional context as it relates to the CVMSHCP/NCCP planning boundaries.

As illustrated in table 5.3, agriculture is one of the predominant land uses within the Coachella Valley. Farmland in the lower Coachella Valley may be categorized into two primary groups: (1) valley land that receives CVWD water and (2) hillside land that mostly relies on well water for irrigation. Land in the valley is more versatile, with field and row crops, produce, and permanent plantings of grapes, citrus and dates. The hillside land is almost planted exclusively with permanent crops, most of which are table grapes. However, permanent plantings, including table grapes and some citrus varieties, are suffering from the increasing inability of a large number of vineyards and groves to receive premium prices. As a consequence, older, less profitable vineyards are frequently purchased for conversion to vegetables and row crops.

Table 5.3 also lists 4,356 acres within the region dedicated to wind energy production. The valley's northwest entrance from the Inland Empire along Interstate 10 is known as the "San Gorgonio Pass" and is one of the windiest places on Earth. Cool coastal air is forced through the pass and mixes with the hot desert air, making the San Gorgonio Pass one of only three ideal places in California for steady, wind-generated electricity. Hundreds of huge wind turbines, spread across the desert and hills on either side of the highway, greet visitors as they approach the crest of the pass and have become a symbol of the area.

Minerals

Currently, no mineral development or exploration is occurring on Reclamation lands within the study area. Additionally, development of mineral resources would not be permitted if it would interfere with the use of the land for operation and maintenance of the Coachella Canal. Because it is known that lands within the region and adjacent to the study area have potential for mineral or energy development, it is assumed that this same potential exists on Reclamation

Table 5.3 – Existing land uses

Use	Total acres
Urban	67,364
Rural, rural residential	12,516
Agriculture	84,852
Lake (includes the Salton Sea)	43,460
Reservoir[1]	816
Wind energy uses	4,356
Quarry	928
Landfill	412
Public and private non-conservation lands[2]	320,566
Open space public and private conservation lands[3]	600,991
Indian reservation lands	69,578

[1] Includes Lake Cahuilla, Whitewater River recharge ponds, and other artificial water bodies.

[2] Includes private lands which are primarily undeveloped and public lands owned by Riverside County, Metropolitan Water District, the State Lands Commission, cities, the U.S. Army Corps of Engineers, Coachella Valley Water District, Reclamation, and the military which are used for non-conservation purposes.

[3] Includes public lands dedicated to open space and conservation purposes and private lands owned by land trusts or conservation organizations.

Table 5.4 – Land ownership (as of July 7, 2000)

Agency	Acres
Bureau of Land Management	283,016
California Department of Fish and Game	23,030
California Department of Parks and Recreation	13,010
Center for Natural Lands Management	708
Coachella Valley Mountains Conservancy	1,697
Coachella Valley Water District[1]	2,767
County	2,187
Desert Water Agency[1]	752
Friends of the Desert Mountains	1,064
Metropolitan Water District[1]	58
Military	125
National Park Service	167,685
Private	517,931
State Lands Commission	7,004
The Living Desert	641
The Nature Conservancy	1,576
The Wildlands Conservancy	5,124
U.S. Army Corps of Engineers	650
U.S. Fish and Wildlife Service	3,360
U.S. Forest Service	92,307
University of California Natural Reserve System	6,335
Indian Reservation[2]	69,578

[1] May not include all lands owned by this agency within the planning area.

[2] Includes all reservation lands, including tribal trust, allotted lands, and tribal fee (privately owned) lands.

administered lands. However, the extent or quantity of these resources is unknown. Geothermal resources are also present within the Coachella Valley.

Mineral and energy resources that are likely to occur within the study area are discussed below:

Oil and Gas There is potential for viable economic production of oil and gas resources to occur on land in the vicinity of the Coachella Canal. Little to no exploration for these resources has been conducted on Reclamation lands, so the extent of their occurrence, if any, is unknown.

Locatable Minerals Locatable minerals could occur in the Mecca Hills area, located in the extreme southeastern portion of the study area, although little exploration has been conducted. There are no known locatable minerals on Reclamation administered land, and no mining claims have been filed.

Leasable Minerals Leasable minerals and other resources that might occur on land administered by Reclamation throughout the study area include geothermal, oil and gas, sodium, and potassium. Commercially viable quantities of these resources have not been found on Reclamation lands, and no exploration and/or sales are projected for the future.

Saleable Minerals Minerals that could be sold are known to occur on Reclamation administered lands throughout the study area. Saleable minerals include clay, sand, and gravel. Records indicate that no sales have occurred on Reclamation land to date. These types of common minerals are readily available throughout the region, and several commercially viable mining operations currently serve the rapidly expanding market.

In the event mineral resources were considered for development within the study area, Reclamation would be required to coordinate closely with BLM. By law, BLM is responsible for all mineral actions on Reclamation-administered land. This coordination would consist of gathering additional information concerning the occurrence and potential quantities of any mineral resources, as well as an assessment of the potential impacts resulting from the development of the mineral resource, especially impacts to the O&M of the canal.

Environmental Consequences

Alternative A

Under this alternative, existing land use authorizations would be allowed to continue. New authorizations would be allowed if they would not adversely affect Project features or the delivery of water to Coachella Canal water users. Private exclusive uses would not be allowed. Land uses that adversely affect threatened and endangered or other special status species or critical habitat also would not be allowed unless proper mitigation measures could be achieved and

environmental clearances obtained. Continued urban encroachment and the issuance of land use authorizations on a case-by-case basis may increase the administrative cost of operating and maintaining the Coachella Canal Area and adversely affect the potential listing of the canal as a National Historic Place.

Alternative B

Implementation of this alternative would be the same as Alternative A, with the following exceptions. Future land use authorizations would be limited to those that benefit natural and cultural resources within the study area. Additionally, existing land uses that may adversely affect natural and cultural resources would be phased out. Implementation of this alternative would result in the fewest adverse environmental impacts of all alternatives under consideration. Issuing land use authorizations for the benefit of natural and cultural resources would lessen the administrative costs of operating and maintaining the Coachella Canal Area and protect the historical significance of the canal, as compared to Alternative A. Urban encroachment would continue under this alternative and, thus, may increase the administrative costs of operating and maintaining the canal.

Alternative C

Implementation of this alternative would be the same as Alternative A, except that an emphasis would be put on future land use authorizations that maximize recreation, community, and commercial development as well as passive outdoor recreation pursuits on open space areas. Additionally, emphasis would be placed on entering into agreements with non-Federal government entities for planning, developing, and managing additional recreation facilities and opportunities. Emphasis also would be placed on working with recreation managing partners in amending existing agreements to provide for additional developed recreation area and passive recreation opportunities on open space lands. Urban encroachment and issuing land use authorizations to maximize recreation and community development would increase administrative costs of operating and maintaining the Coachella Canal Area and adversely affect the potential listing of the canal as a National Historic Place, when compared to Alternative A.

Alternative D

Implementation of this alternative would be the same as Alternative A, except that land use authorizations would be limited to those that do not adversely affect natural resources. Additionally, emphasis would be placed on entering into agreements with non-Federal government entities for planning, developing, and managing additional recreation facilities and opportunities. Also, under this alternative, land uses that are not compatible with Project purposes would be phased out, whereas under Alternative A all existing land uses would be allowed to continue. Implementation of this alternative could result in fewer adverse

environmental impacts than under Alternatives A or C but potentially greater environmental impacts than under Alternative B. Urban encroachment and the administrative costs of operating and maintaining the Coachella Canal Area would be less than under Alternative A or C but greater than under Alternative B. The adverse effects on the potential listing of the canal as a National Historic Place would be less than under Alternative A or C but greater than under Alternative B.

Mitigation

All new land use authorizations/crossing agreements will need to comply with NEPA, ESA, and National Historic Preservation Act of 1966, as amended, requirements.

When other entities prepare environmental documents for Coachella Canal Area lands, Reclamation will ensure that such environmental documents are reviewed by Reclamation and that they are in compliance with appropriate NEPA guidelines.

Residual Impacts

No residual impacts have been identified.