
SECTION 7 CUMULATIVE IMPACTS

7.1 BACKGROUND

Cumulative impacts refer to two or more individual impacts which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or from a number of projects. A cumulative impact refers to the degree of change in the environment resulting from a particular project, plus the incremental impacts created by other closely-related past, present and reasonably foreseeable future projects. Cumulative impacts may reveal that relatively minor impacts associated with a particular project may contribute to more significant impacts when considered collectively with other projects taking place over a period of time.

Environmental resources included in the consideration of cumulative impacts include agriculture; land use; socioeconomic and growth inducement; topography, geology, seismicity and soils; water resources; air quality; transportation; biological resources; energy and mineral resources; hazards and hazardous materials; noise; public services; utilities and service systems; aesthetics; cultural resources; paleontological resources; wilderness/ recreation; and Indian Trust Assets.

This section summarizes potential cumulative environmental impacts of the Cadiz Project and any related past, present, or reasonably foreseeable future projects. For purposes of this analysis, such projects include the Cadiz Agricultural Development, playa mining projects in the Cadiz and Fenner valleys, other water uses within the Cadiz, Bristol, Fenner and Orange Blossom Wash watersheds and Metropolitan's Hayfield Groundwater Storage Project.

A solid waste disposal project (Rail Cycle Project) has been proposed for the region and a nuclear waste disposal facility (Ward Valley Project) was also proposed. Neither of these projects is currently in advanced planning stages and their implementation is uncertain. There are also significant legal, financial and environmental hurdles facing both projects. For example, in 1996, the voters of San Bernardino failed to approve a tax proposed by the San Bernardino County Board of Supervisors as a condition of the approval for the Rail Cycle Project. In August 2000 the California Court of Appeal (4th District) ruled the Environmental Impact Report prepared in connection with the Rail Cycle Project was invalid. As a result, Rail Cycle Project environmental and land use approvals were revoked. Both projects are not considered reasonably foreseeable at this time.

The analysis of potential cumulative impacts associated with the Cadiz Project and past, present or reasonably foreseeable projects evaluates these impacts regionally, based on population and employment projections for 2020, and on a more specific level based on known planned land uses and the Cadiz Project alternatives.

7.2 CUMULATIVE PROJECTS

7.2.1 REGIONAL PLANS

The proposed construction and operation of the Cadiz Project will be coordinated, and is consistent with, the regional plans of the Southern California Association of Governments (SCAG), the San Bernardino Association of Governments (SANBAG) and the San Diego Association of

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Governments (SANDAG). These plans, as well as the Regional Mobility Plans, Growth Management Plans, Air Quality Management Plans and the San Bernardino County General Plan and BLM California Desert Conservation Area Plan, have been the subject of separate Environmental Impact Reports and Environmental Impact Statements that specifically address their particular impacts.

The Hayfield Project has been similarly coordinated with, and is consistent with, SCAG's regional plans, the Riverside County General Plan and other applicable regional and local plans.

By assisting in the provision of dry-year water supply to reliably serve the population forecast by these regional plans, the Cadiz and Hayfield projects are found to be cumulatively consistent with meeting forecast infrastructure needs. Cumulatively, the Cadiz and Hayfield projects are also not in conflict with any plan policies or goals. Both projects provide a dry-year supply of water that will be conveyed to Metropolitan's distribution system for use in a manner that is fully consistent with regional and local land use plans.

7.2.2 APPROVED AND PROPOSED LAND DEVELOPMENT IN THE CADIZ PROJECT AREA

According to the County of San Bernardino, there are no locally planned, approved or reasonably anticipated land development projects in the vicinity of the Cadiz Project. Therefore, no cumulative effects will result due to land development activities occurring cumulatively with the Cadiz Project.

7.2.3 HAYFIELD VALLEY GROUNDWATER STORAGE PROJECT

Metropolitan recently approved the Hayfield Project as part of its efforts to provide sites for storage of Colorado River water. The Hayfield groundwater basin is located in the Mojave Desert north of Interstate 10 (I-10), approximately three miles east of Chiriaco Summit and eight miles west of Desert Center, between Metropolitan's Eagle Mountain and Julian Hinds pumping plants on the Colorado River Aqueduct. The project site is directly adjacent to the Colorado River Aqueduct. Preliminary feasibility analysis indicated that groundwater storage in the Hayfield basin was technically feasible and cost effective. This project is currently under construction.

The Hayfield Project includes the following three components:

1. Geotechnical and hydrogeological investigations and a pilot demonstration program;
2. Construction of the full-scale facilities to store and retrieve groundwater; and
3. Land acquisition in the vicinity of the project to consolidate property ownership to protect groundwater resources and quality.

Under the Hayfield Project, Metropolitan will store approximately 800,000 acre-feet of available Colorado River water in the Hayfield groundwater basin. Similar to the Cadiz Project, during years of water shortage, this stored water will be recovered and placed in the Colorado River Aqueduct for use in Metropolitan's service area. Expected recharge and return capacity of the Hayfield Project is approximately 150,000 acre-feet per year.

7.2.4 PAST, PRESENT, AND REASONABLY FORESEEABLE WATER USES WITHIN THE BRISTOL, CADIZ, FENNER AND ORANGE BLOSSOM WASH WATERSHEDS

Mojave National Preserve

The Mojave National Preserve is located approximately 15 miles north of the Cadiz Project area and includes portions of the Fenner Valley and Orange Blossom Wash watersheds, which are tributary to the project area. Groundwater underlying the Preserve flows generally southward toward the project area. Small-yield wells produce groundwater for domestic use, camping, and stock watering. Use by wildlife is generally limited to naturally occurring springs and man-made guzzlers. Most springs within the preserve are small and flow less than 5 gallons per minute (Freiwald 1984 as cited in NPS 1999). An inventory of 28 known springs within the Fenner and Orange Blossom Wash watersheds will be prepared in cooperation with the agencies within the U.S. Department of the Interior.

Detailed information regarding water use within the Preserve is limited, and the NPS has identified future investigation and documentation of this resource as a high priority (NPS 1999). The only quantitative water use information available within the preserve is for the fire station, Visitor Information Center (kiosk) and campground located at Hole-in-the-Wall, within the Fenner Valley watershed (Chris Stubbs, NPS, personal communication, June 2000). Water use at these facilities reaches a peak of approximately 1,700 gallons/day in the summer when demand for fire suppression is highest, and drops to approximately 500 to 800 gallons/day in the winter (when demand is highest from campers) (David Moore, NPS, personal communication, June 2000). Total water use at these facilities is estimated to average no more than 1.4 acre-feet/year. This use is not expected to appreciably expand in the foreseeable future (Chris Stubbs, NPS, personal communication, June 2000).

Federal Lands Administered by BLM

The BLM administers federal lands outside of the Preserve within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds. Water uses on these lands are similar to those in the Preserve, and include stock watering, mining, and use by wildlife. Quantitative information on water use is not available.

Water Uses On Private Land

Water uses on private land within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds include domestic use, stock watering, agriculture, mining, grazing, and use by wildlife. In the vicinity of the project area, groundwater is produced from wells owned by the BNSF, one well owned by El Paso Natural Gas (formerly owned by All American Pipeline LLP), the Cadiz Valley Agricultural Development, domestic residences, and the salt mining operations on Bristol and Cadiz dry lakes.

It is estimated that fewer than 20 individuals live in the community of Chambless, located approximately 5 miles north of the proposed project wellfield, and fewer than 100 individuals are estimated to live within the watersheds tributary to the project area. Domestic water use in the region is not expected to increase appreciably in the foreseeable future.

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Cadiz Agricultural Development

Cadiz owns more than 27,000 acres in the vicinity of the project area as shown in Figure 2-1. Approximately 1,600 acres of this land have been developed for vineyards, citrus orchards, and various types of row crops. Seven groundwater production wells were installed between 1984 and 1994 to provide irrigation for the agricultural operation using water-conserving drip and micro-spray techniques. Current groundwater use for irrigation averages between approximately 5,000 and 6,000 acre-feet/year.

In 1993, San Bernardino County certified a Final Environmental Impact Report (FEIR) (SCH#89020203) and granted various land-use approvals for expansion of operations in the Cadiz Valley Agricultural Development up to 9,600 acres. The FEIR anticipated the withdrawal of up to 30,000 acre-feet/year for agricultural irrigation at build-out.

As a component of the FEIR, the County identified specific groundwater monitoring activities to be undertaken by Cadiz. To comply with these monitoring requirements, the Cadiz Valley Agricultural Development Ground Water Monitoring Plan (GWMP) was developed in cooperation with San Bernardino County to monitor potential environmental impacts that could result from the agricultural operations. Expansion of the agricultural operation to 9,600 acres could occur without any further discretionary approvals subject to the provisions of the GWMP.

Salt Mining Operations on Bristol and Cadiz Dry Lakes

As described in Section 2.6, salt mining operations on Bristol and Cadiz dry lakes produce both calcium chloride and sodium chloride from highly saline brines. Mining claims on Bristol Dry Lake date from 1908, and gypsum deposits were worked until approximately 1924-25. The saline brine, produced from both wells and trenches, is pumped into ponds for concentration by evaporation. When the brine solution reaches marketable densities, it is pumped from the evaporation ponds and shipped or converted into a dry product at flaking facilities. The area of surface disturbance by these mining facilities is typically a small fraction (less than 1/10th) of the area under reclamation plan approval. The existing operations are generally low intensity (i.e. commonly 5-10 employees) for operations spread over hundreds of acres.

Mining is conducted on patented lands and on unpatented claims and leases on federal land administered by the BLM.

The following mining operations currently exist in the area:

- Tetra Technologies, Inc. is authorized to mine 10,835 acres on Bristol Dry Lake for the production of calcium chloride and sodium chloride.
- National Chloride Company of America is authorized to mine 162 acres on Bristol Dry Lake for the production of liquid calcium chloride and sodium chloride.
- Lee Chemical, Inc. is authorized to mine 685 acres on Cadiz Dry Lake for the production of liquid calcium chloride.

The locations of these operations are shown in Figures 5.9.1 through 5.9.5 in this Final EIR/EIS. The Hills Brothers operation shown in these figures is a flaking plant, which processes brine produced by the above-described mining operations.

The amount of brine produced by these mining companies is proprietary information, and precise estimates are unavailable.

The County of San Bernardino recently approved a conditional use permit and reclamation plan for the Tetra Tech operation. This approval extends the permit for this operation by 30 years, from a closure date of 2001 to 2031. The approval does not authorize expansion of the existing operation. (San Bernardino County Planning Staff Report for Agenda Item 2, Meeting of the San Bernardino County Board of Supervisors, May 10, 2001) None of the other mining operations are expected to expand substantially in the foreseeable future (Ken Downing and Kathleen Cox, BLM; and Rich Touslee, San Bernardino County, personal communication, June 2000).

7.3 CUMULATIVE IMPACTS

Cumulative impacts refer to two or more individual impacts that, when considered together, are substantial or that compound or increase other environmental impacts. The cumulative impact of a project or action would be the change in the environment that results from the incremental impact of the proposed project or action when added to other past, present, or reasonably foreseeable future projects or actions. Cumulative impacts could result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines Section 15355; 40 C.F.R. Section 1508.7).

Although not a requirement under CEQA or NEPA, the cumulative impacts analysis for the Cadiz Project evaluates the cumulative impacts for all project alternatives. The potential cumulative impacts of the Cadiz Project discussed below by environmental category apply equally to all of the project alternatives. In particular, this discussion notes those categories where the Cadiz Project's contribution to impacts could be significant and therefore would potentially contribute to a cumulative impact when considered in conjunction with the impacts of the other projects or actions.

7.3.1 AGRICULTURE

None of the considered projects or actions, nor the Cadiz Project, regardless of which alternative is chosen, will impact prime farmland, and only a small amount of farmland at the Cadiz Inc. agricultural operations will actually be impacted by the wellfield facilities necessary to implement the Cadiz Project. The Cadiz Agricultural Development could expand from the existing 1,600 acres to a total of 9,600 acres. However, this would not be considered an adverse impact, nor would such expansion conflict with the proposed project. Therefore, cumulative impacts on agriculture will not be significant.

7.3.2 LAND USE, PLANNING AND POLICIES

The Hayfield Project would be developed on vacant land, and does not conflict with any applicable land use plan, policy or regulation or natural community conservation plan.

The part of San Bernardino County where the Cadiz Project will be located is mostly vacant and undeveloped. A small part of this area is used for agricultural purposes. Land administered by the BLM in the Cadiz Project area is used for recreation, open space and mineral extraction. None of the Cadiz Project alternatives would result in a significant adverse impact to the land use character of the Cadiz Project area, as many of the facilities to be constructed for this project will be located underground. The above ground facilities for all project alternatives (project wellfield, project spreading basins, etc.) and power distribution lines are consistent with the open space character of

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the surrounding area.

With the previously mentioned exception of a small amount of farmland, impacts of the Cadiz Project will be short-term and will not result in displacement of existing land uses. Implementation of the Cadiz Project will require acquisition of a grant of right-of-way from the BLM, but this will not result in a significant adverse impact, since the major Cadiz Project facilities and the water conveyance facilities will be buried. Other permanent surface facilities including the spreading basins, power distribution facilities and unimproved maintenance access roads will be consistent with the open space character of the surrounding area and, in addition, will occupy only a small percentage of total acreage in the Cadiz Project area. In addition, the Cadiz Project construction activities will be coordinated with area railroads and Cadiz Inc. agricultural operations and the operations of the Colorado River Aqueduct so as to minimize impacts on these land uses.

Other water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds are also consistent with existing land use plans, policies and regulations. Therefore, the Cadiz Project is not expected to contribute to either short or long term cumulative land use impacts when considered in conjunction with the Hayfield Project, and other water uses in the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds, regardless of which project alternative is chosen.

7.3.3 SOCIOECONOMICS AND GROWTH INDUCEMENT

The existing mining and agriculture contribute most of the existing employment and population of the area. The Cadiz Agricultural Development is required to provide facilities and services as it expands and is not expected to displace housing needed for other land uses. The mining projects are not expected to substantially expand the workforce in the foreseeable future, nor are water use by the Mojave National Preserve, federal lands administered by the BLM, or water uses on private land expected to increase.

Neither the Hayfield Project nor the Cadiz Project will displace existing housing or induce population growth in the surrounding area, regardless of which Cadiz Project alternative is chosen.

A number of short-term construction jobs will be created by the Cadiz Project and future phases of the Hayfield Project, but construction workers are expected to come from the cities some distance from the Cadiz Project area and from the regional labor pool. These jobs are not expected to significantly change the economy of the area or region.

The Cadiz Project as well as the Hayfield Project would bank excess water available from the Colorado River Aqueduct for future use. The use of this water to meet dry-year demands is consistent with regional plans and is considered by regional planning agencies to mitigate the adverse impacts of planned growth. Therefore, the Cadiz Project, when considered in conjunction with the Hayfield Project and other water uses in the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds,, will not result in significant adverse cumulative area or regional socioeconomic or growth inducement impacts. Refer also to Section 6 (Growth Inducement Impacts).

7.3.4 TOPOGRAPHY, GEOLOGY, SEISMICITY AND SOILS

None of the projects or actions considered in this cumulative impacts analysis, including the Hayfield and the Cadiz projects involve significant changes to the existing topography.

Development of the Cadiz Project will not contribute to cumulative significant changes in the

existing topography and soils. In areas where conveyance facilities traverse major topographic features, construction will be limited to cut-and-cover excavation with limited surface modification for pumping stations, wells and electrical substations. Therefore, the Cadiz Project, regardless of which alternative is chosen, will not result in a significant adverse impact on topography by itself and will not cause a significant cumulative effect when considered in combination with the Hayfield Project, which also involves only minor, insignificant surface disturbance.

With respect to geological impacts, all projects or actions have been or will be designed and constructed in compliance with all applicable federal, state, regional and local regulations relating to site specific geologic conditions and will not, individually or together, result in significant cumulative impacts with respect to geologic conditions.

7.3.5 WATER RESOURCES

The Cadiz Project and Hayfield Project will both use excess Colorado River water for storage in the aquifer systems underlying their respective project areas for use during dry-years. Therefore, cumulatively the Cadiz Project will add to the availability of water for use in dry-years and will contribute to a cumulative beneficial water resource impact in the region.

As previously mentioned, there are no reasonably foreseeable future projects contemplated in the regional watersheds tributary to the Cadiz Project area, which are the Bristol, Cadiz, Fenner, and Orange Blossom Wash watersheds. Consequently, for purposes of cumulative water resources impacts analysis, the Cadiz Project has been considered in combination with all past, present, and reasonably foreseeable water uses within these watersheds.

All of the groundwater uses discussed in Section 7.2.4 combined, with the exception of the Cadiz Valley Agricultural Development, are very small in relation to the estimated 16.9 million acre-feet of indigenous groundwater in storage underlying the Bristol, Fenner, and Cadiz valleys (DWR 1975). Accordingly, these combined uses do not result in significant adverse impacts to groundwater supplies.

None of the Cadiz Project alternatives would result in significant adverse impacts to water resources because all project operations would be subject to the provisions of the Management Plan, presented in Volume IV of this Final EIR/EIS. The Management Plan was prepared as a result of cooperative efforts by Metropolitan, BLM, NPS, USGS, the County of San Bernardino, and Cadiz Inc. A fundamental objective of the Management Plan is to provide “early warning” of potential adverse impacts to critical environmental resources in and surrounding the project area that could result from project operations. With such early warning, adverse impacts will be prevented by implementation of suitable corrective actions.

With approval and implementation of the Cadiz Project, all future groundwater use for irrigation in the project area, including any existing or future expansion of the Cadiz Valley Agricultural Development, will be conducted without adverse impacts to critical resources in accordance with the Management Plan. The Management Plan provides for a comprehensive program of monitoring designed to ensure that project operations, including future irrigation under the Cadiz Valley Agricultural Development, will be conducted without adverse impact to any critical environmental resources in and surrounding the project area. Thus, with implementation of the Cadiz Project and Management Plan, any potential adverse impact of the Cadiz Valley Agricultural Development will be fully mitigated to below a level of significance.

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The Management Plan also contains provisions designed to ensure that the other water uses discussed above will not be impacted by the addition of the Cadiz Project. With respect to water uses within the preserve, the Management Plan outlines specific provisions to prevent any impacts to groundwater levels or springs as a result of project operations. Likewise, the Management Plan outlines specific provisions to prevent any impacts to springs located within designated BLM wilderness areas and to Bonanza Spring, located on BLM administered federal land approximately 12 miles north of the project area. The Management Plan also outlines specific provisions to prevent adverse impacts to potable water wells owned by neighboring landowners in proximity to the project area. The Management Plan also provides for a comprehensive program of monitoring designed to ensure that project operations will not adversely impact the brine resources on Bristol and Cadiz dry lakes.

Because the combined impact of all water uses in the area, except the Cadiz Project and the Cadiz Valley Agricultural Development, will not have potentially significant adverse impacts on groundwater supplies and because the Management Plan will ensure that the Cadiz Project and the Cadiz Valley Agricultural Development will not have any significant adverse impacts on water resources, the cumulative impact of the Cadiz Project and all other past, present and reasonably foreseeable future water uses in the area is determined to be less than significant, regardless of which alternative is chosen.

7.3.6 AIR QUALITY

The Mojave Desert Air Quality Management District adopted the 1990 Air Quality Management Plan that projected growth-related increases in air pollution emissions in the Air Basin and established rules and controls that guide and direct activities that will result in an overall improvement in air quality over the next 20 years. The Cadiz Project is in a nonattainment area for ozone (state standard) and particulate matter less than 10 microns in diameter (state and federal standards). Air quality impacts generated by the Cadiz Project, regardless of which alternative is chosen, will predominately be short term and related to construction. In particular, short term Cadiz Project emissions of NO_x, VOC (O₃ precursors), and PM₁₀ will be generated during the construction of the Cadiz Project. Over the short term, these adverse construction impacts will be significant based on the MDAQMD emission thresholds.

Construction impacts on air quality for the Hayfield Project are anticipated to be insignificant, but could cumulatively add to the significant construction emissions of the Cadiz Project. However, the effects of these potential impacts will be localized in the construction area for each project, and their cumulative effect will be highly dependent on the timing of construction activities between the Cadiz and the Hayfield projects. The two projects would contribute to a short term significant cumulative impact on local air quality during construction due to the contribution of pollutants into a non-attainment area.

However, when considered over the long term, the Cadiz and Hayfield projects together will not result in a significant cumulative adverse impact on local or regional air quality since they will draw from an existing power supply and will involve few employees and maintenance trips. Air impacts due to other water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds have been considered in the baseline conditions for the Cadiz Project. Therefore, any contribution to adverse cumulative air impacts has been considered.

7.3.7 TRANSPORTATION

The impact analysis performed in Section 5.7 includes the other water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds in the background condition. Due to the very low volumes of background traffic, the forecasted increases in traffic volumes in eastern San Bernardino County associated with the construction of the Hayfield Project and any one of the Cadiz Project alternatives together will not result in a significant cumulative effect on transportation, even if construction of these two projects were to occur simultaneously. Any expansion of the Cadiz Agricultural Development would extend over several years and is not likely to coincide with construction of either the Hayfield or Cadiz projects.

Due to the relatively small number of employees and limited number of trips required for operations and maintenance activities, the Hayfield Project and Cadiz Project are not be expected to generate significant trips in the long term throughout the study area. Therefore, these projects will not result in a significant cumulative traffic impact over the long term.

The operation of the Hayfield Project and Cadiz Project will likely generate only one or two flights per week into the private airstrips adjacent to the respective project sites. Therefore, the Cadiz Project and the Hayfield Project will not result in a significant cumulative air traffic impact.

7.3.8 BIOLOGICAL RESOURCES

Regional resources such as Mojave creosote scrub, Mojave wash scrub and desert dunes/desert sand fields are being removed as growth and development continue in Mojave desert. However, there is relatively little development activity and corresponding growth in this subregional area. There is no current development activity in the Cadiz Project area. The mining operations occur on barren areas of the playas and have little if any impact to biological resources.

The Cadiz Agricultural Development is located within low quality, low density habitat (Category III) for desert tortoise. Pre-expansion surveys are required by USFWS, CDFG and San Bernardino County. Future expansions are expected to have little impact to biological resources and any future impacts can be compensated for with habitat of higher quality than that affected by agricultural development.

Although there is little loss of habitat due to development of the Cadiz and Hayfield projects, there is a need to protect habitat and the species which utilize it from adverse impacts of recreational use. By placing currently unprotected habitats under Federal and/or Metropolitan protection in mitigation for project impacts, all of the Cadiz Project alternatives and the Hayfield Project offset localized biological resource impacts. Viewed together, they do not cause significant cumulative impacts to biological resources, regardless of which Cadiz Project alternative is chosen.

7.3.9 ENERGY AND MINERAL RESOURCES

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will contribute to cumulative impacts on energy and mineral resources. The playa mining operations extract a renewable mineral resource and use passive means (solar evaporation) for most of their energy needs. The Cadiz Agricultural Development, Mojave National Preserve, Federal lands administered by the BLM and water uses on private land also have little effect upon mineral and energy resources. The Cadiz and Hayfield projects do not impact any mineral resource

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areas in common. They both will require electrical power from Metropolitan's Iron Mountain Pumping Plant power distribution system, which distributes hydroelectric power generated on the Colorado River. A sufficient supply of power is currently available from Metropolitan's existing Colorado River Aqueduct power supply at Iron Mountain Pumping Plant to power the operation of the Cadiz Project. Facilities for both projects will be operated when certain Colorado River Aqueduct pumps are taken off line, freeing up the available power supply. The use of this available power will not result in an impact on the supply of energy normally available to the eastern part of San Bernardino County.

7.3.10 HAZARDS AND HAZARDOUS MATERIALS

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will contribute to cumulative impacts related to hazards and hazardous materials. The mining operations do not require hazardous materials such as explosives because they do not employ blasting techniques for excavation. They do use fuels, solvents and lubricants which can create hazards if not handled properly. Likewise the Cadiz Agricultural Development uses materials typical of agriculture, such as chemical sprays, fuels, solvents and lubricants. However, due to existing regulations governing such hazardous materials, such use in combination with any use of hazardous materials by the Hayfield and Cadiz projects is not expected to result in significant adverse impacts related to the use or transport of hazardous materials or the generation or transport of hazardous wastes.

However, the Cadiz Project has the potential to result in significant adverse impacts related to the presence of ordnance and explosives from former military exercises in the Cadiz Project area. The exact location and quantity of these materials are not known. Therefore, the significance of this impact can not be quantified. Harmful ordnance and explosives have been discovered randomly throughout this part of the California desert on numerous occasions since the late 1940s. Although these discoveries have been infrequent in recent times, each discovery poses a potentially significant hazard. Therefore, excavation and grading for the Cadiz Project have the potential to result in significant adverse impacts related to ordnance and explosives.

The Hayfield Project is not anticipated to result in significant adverse impacts related to unexploded ordnance, as it is located in an area not likely to contain unexploded ordnance.

All of the Cadiz Project alternatives would have a cumulatively beneficial impact by providing important information to the BLM and other agencies concerning the location of remaining ordnance and explosive wastes in the area and methodologies used to locate and remove them. The Cadiz Project will also result in clearance of explosive hazards from an area of desert land.

7.3.11 NOISE

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will contribute to cumulative noise impacts as all are low intensity land uses covering extensive geographic areas. The noise generated by these uses are far from receptors and dispersed over broad expanses. They are distant from the Cadiz Project as well. For example, the mining on Bristol Lake is approximately 14 – 16 miles from the project spreading basins and the mining on Cadiz Lake is 3 – 5 miles from the transmission pipeline depending upon which alternative is selected. The Hayfield Project and Cadiz Project are not expected to result in significant adverse noise impacts on sensitive land uses during construction or operations. The San Bernardino County General Plan Land Use map designates most of the area of the Cadiz Project as Resource

Conservation (RC) and a substantial amount of this area is under the jurisdiction of the BLM and other agencies. Therefore, it is unlikely that a substantial amount of new development or new cumulative noise sources would occur in this area over the life the Cadiz Project. In general, ambient noise levels in the Cadiz Project area are expected to remain low to very low in the future. Therefore, the Cadiz Project alternatives, the Hayfield Project and other water uses in the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds are not expected to contribute to significant long term, cumulative adverse noise impacts.

7.3.12 PUBLIC SERVICES

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will contribute to cumulative impacts related to public services. The existing mining operations and Cadiz Agricultural Development do not create high demand for public services. The greatest obstacle to providing services is the distance from service providers, which are generally in the Morongo Basin (Twentynine Palms, Joshua Tree, etc.). The Cadiz Agricultural Development is required to make arrangements for public services prior to substantial expansion and consequent need for more workers. During construction, the Cadiz and Hayfield projects will make a negligible contribution to the demand for public services. Operational impacts of each project related to public services will also be negligible. In combination, the projects will not result in a significant cumulative adverse impact on public services.

7.3.13 UTILITIES AND SERVICE SYSTEMS

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will contribute to cumulative impacts related to utilities and service systems as they have little demand for utilities and services and existing services are adequate for the existing demand. In addition, the Cadiz Agricultural Development is required to make arrangements for public services prior to any substantial expansion and consequent need for more workers. The Hayfield Project would not significantly contribute to a cumulative effect on the demand for utilities in eastern Riverside County. All of the Cadiz Project alternatives would create a slight increase in demand for utilities in the Cadiz Project area in San Bernardino County. However, the Cadiz Project will not contribute to a significant cumulative impact when considered with these other projects because of the very small utility and service system demands associated with both projects over the long term.

The Hayfield Project and Cadiz Project will contribute to a cumulatively positive impact on water supply availability in Metropolitan's service area since the projects will help to provide an additional supply of water for use during dry-years.

7.3.14 AESTHETICS

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will contribute to cumulative adverse aesthetic impacts. The eastern Riverside County area where the Hayfield Project is located and eastern San Bernardino County where the Cadiz Project is located are mostly undeveloped. Some agricultural, resource extraction and recreational/open space uses are present in these areas. As additional projects are developed in these areas, their visual quality will be modified. However, the mining operations, other private uses, and Cadiz Agricultural Development, as well as the Hayfield and Cadiz projects, occur over large areas of the eastern Mojave Desert, consequently they are not generally in the same watershed as one another. Mining has been an ongoing use since 1908 and agriculture since 1978. The Cadiz Project

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facilities would be located along existing roads, railroads and utility lines whenever practical. The general effect of these projects is the creation of views that show evidence of human alteration but which are still dominated by views of natural landscape features (i.e., mountains, playas, lava flows, sand dunes).

Both the Hayfield Project and the Cadiz Project will result in temporary adverse aesthetic impacts during construction. The Cadiz Project water conveyance and power distribution facilities construction will be visible from BLM wilderness areas located adjacent to the alignments of these facilities. Associated construction activities will result in the temporary degradation of views from these wilderness areas. Construction activities for the Hayfield Project would involve disturbances for pipeline and wellfield construction. The Hayfield Project may also involve spreading basin construction in the area of Cholla Wash. As with the Cadiz Project, the Hayfield Project would result in temporary areas of bare soil, construction equipment and materials storage areas that create a temporary aesthetic impact. For the Hayfield Project, these areas will be visible from I-10. The Cadiz Project construction activities, when considered together with the Hayfield Project construction activities, will result in a temporary significant cumulative adverse impact on aesthetics.

Over time, the area where the Cadiz Project water conveyance and power distribution facilities will be developed will be revegetated, although it will take some years for the vegetation to mature because of the limited amount of local rainfall. Due to the existence of the Colorado River Aqueduct, the presence of pumping stations, pipelines, power lines, canals and other infrastructure in the visual context of the Cadiz Project is a relatively common occurrence. All of the Cadiz Project alternatives would add to these existing facilities with its new pump stations, wells, spreading basins and substations. The Hayfield Project is adjacent to the Colorado River Aqueduct and the Eagle Mountain Mine and, therefore, the new wells, spreading areas and ancillary facilities will not adversely affect the long-term appearance of that area. Together, the Cadiz Project, the Hayfield Project and other water uses in the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds do not result in a long-term significant cumulative aesthetic impact, regardless of which alternative is chosen.

7.3.15 CULTURAL RESOURCES

Cultural resources in the Cadiz Project area are related to the early development of this area including the development of railroads, the Colorado River Aqueduct and the Iron Mountain Pumping Plant, and the extensive use of this area for military purposes. As described earlier, only limited additional development is anticipated in the Cadiz Project area. Other future development projects would be required to comply with applicable regulations regarding the protection and avoidance of cultural resources, and the recovery and documentation of resources when avoidance is not possible. None of the other water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds are known to have any impact on cultural resources.

The Hayfield Project area has been used by Native Americans, the historical development of mining activities, the Colorado River Aqueduct and Hayfield Pumping Station. Mine facilities, Colorado River Aqueduct facilities and equipment are part of the cultural resource context of the Hayfield site.

Neither the Hayfield Project nor any of the Cadiz Project alternatives will result in significant adverse impacts related to cultural resources after implementation of project specific mitigation measures. There will be a beneficial effect related to increased knowledge regarding the prehistory and history of the Cadiz Project and Hayfield Project areas, based on recovery and documentation of cultural

resources prior to and during construction of the two projects.

Therefore, no cumulatively significant adverse impact on cultural resources is anticipated, regardless of which Cadiz Project alternative is chosen.

7.3.16 PALEONTOLOGICAL RESOURCES

There are no known paleontological resources or sites within the impact area of the Hayfield Project. The existing mining operations are not known to have any impacts on paleontological resources. The depositional environments favorable for recovery of fossils prevails near historic lake margins rather than on the playa surfaces per se. The Cadiz Agricultural Development was found to have the potential to unearth and recover significant resources. Preconstruction surveys and salvage of fossils is therefore required for any expansion of the agricultural use.

There are known paleontological resources or sites within the Cadiz Project area. Regardless of which alternative is chosen, the Cadiz Project will result in significant adverse impacts related to paleontological resources after implementation of the Cadiz Project mitigation measures. There will be a beneficial effect of the Cadiz Project related to increased knowledge regarding soil and rock formations in this area based on the recovery and documentation of the paleontological resources contained in these formations during construction of the Cadiz Project.

Only limited additional development is anticipated in the Cadiz Project area in the future because much of the land is under the protection of the state and the BLM. Much of this area has been documented as containing fossil bearing soils and rock formations. Other projects would be required to comply with applicable regulations regarding the protection and avoidance of paleontological resources and the recovery and documentation of resources when avoidance is not possible.

Construction of the Cadiz Project will result in the disturbance and unearthing of paleontological resources.

Mitigation measures included in the Cadiz Project will substantially reduce the short-term impact of the Cadiz Project on paleontological resources, but not to below a level of significance. This will be an unavoidable adverse impact during construction of the Cadiz Project. Therefore, the Cadiz Project will result in adverse impacts on paleontological resources. However, because only limited additional development is anticipated in this region, this will not be a significant cumulative adverse impact of the Cadiz Project and other projects in this region.

Therefore, the Cadiz Project, the Hayfield Project, and other water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will not contribute to a cumulatively significant adverse impact on paleontological resources, regardless of which alternative is chosen.

7.3.17 WILDERNESS/RECREATION

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds will contribute to cumulative adverse impacts related to wilderness/recreation resources, nor will the Hayfield Project result in the loss of any wilderness or recreational resources. None of the Cadiz Project alternatives would directly impact any wilderness or recreational resources, although parts of the Cadiz Project area are adjacent to a wilderness area under the jurisdiction of the BLM. Visitors to these wilderness areas will have off-site views of the construction of the water

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conveyance and power distribution facilities that are part of the Cadiz Project and some construction activity may be audible in those areas closer to active construction zones. This is not considered a significant cumulative adverse impact since no wilderness or recreational areas will be lost and construction noise will be only a temporary effect of the Cadiz Project.

7.3.18 ENVIRONMENTAL JUSTICE

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds, the Hayfield Project or the Cadiz Project will create any environmental justice impacts. Water supply from the Cadiz and Hayfield projects will be equitably distributed by Metropolitan in adherence to Board policy. Neither the construction nor operation of any of these projects will disproportionately impact or benefit any disadvantaged populations. Therefore, no adverse cumulative impacts on environmental justice will arise as a result of the Hayfield Project, the Cadiz Project, or the other water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds.

7.3.19 INDIAN TRUST ASSETS

None of the considered water uses within the Bristol, Cadiz, Fenner and Orange Blossom Wash watersheds, the Hayfield Project and Cadiz Project will create any impacts on Indian Trust Assets (ITAs) since none are located in the areas of these projects. Therefore, there will be no adverse cumulative impacts on ITAs.