DRAFT
ENVIRONMENTAL IMPACT REPORT
FOR
THE INDIO WATER AUTHORITY
RECYCLED WATER PROJECT

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CHAPTER 1 – EXECUTIVE SUMMARY

1.1 BACKGROUND

This Executive Summary has been compiled by the Indio Water Authority (IWA) to implement a program to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City of Indio and for possible groundwater recharge of the underlying aquifer. IWA has prepared this Draft Environmental Impact Report (DEIR) that summarizes the environmental effects that are forecast to occur from installation and operation of the additional treatment systems required to produce recycled water and then deliver the recycled water to irrigation sites that currently utilize potable water or to potential groundwater recharge locations. These facilities and their operation are hereafter termed the "proposed project."

This Chapter also contains a summary of the project background, project objectives, and project description. As required by the State California Environmental Quality Act (CEQA, Section 15123), this chapter of the DEIR contains a summary of environmental findings and mitigation measures. A tabular summary of impacts and mitigation measures is included at the end of this Executive Summary. Chapter 2 provides an Introduction to the DEIR and Chapter 3 provides a detailed Project Description. Chapters 4 through 6 contain the evaluation of potential environmental effects from implementing the proposed project, and a comparison between the available and feasible alternatives.

As the Lead Agency for compliance with the California Environmental Quality Act, IWA, is required to identify the potential environmental impacts of the project and where potential significant impacts are identified the agency must determine whether there are feasible mitigation measures or alternatives that can be implemented to avoid or substantially lessen significant environmental effects of the project. An Initial Study was completed to determine whether an EIR was required for the proposed project. Based on the information in the Initial Study, IWA concluded that the project proposed might cause significant adverse environmental impacts to the following issues that would require further analysis in an EIR: ***air quality, biological resources, cultural resources, hydrology/water quality, and noise.***

This DEIR has been prepared to address the issues identified above and provide an informational document intended for use by the IWA, interested and responsible agencies and parties, and the general public in evaluating the potential environmental effects of implementing this proposed project. A copy of the Initial Study is attached as Subchapter 8.1 in Chapter 8 and a copy of the Notice of Preparation (NOP) and comment letters are provided as Subchapter 8.2 in Chapter 8 of this DEIR.

CEQA requires that the IWA, the CEQA Lead Agency, consider the environmental information in the project record, including this DEIR, prior to making a decision regarding whether or not to approve and implement the proposed project. The decision that will be considered by IWA is whether to approve the capital improvement projects defined in Chapter 3 of this document, which include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage

recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. Alternatively, IWA can reject the project as proposed. This DEIR evaluates the environmental effects as outlined above.

IWA will serve as the CEQA Lead Agency pursuant to the State CEQA Guidelines Section 15015(b)(1). This DEIR has been prepared by Tom Dodson & Associates (TDA) under the direction of the IWA. TDA was retained to assist IWA to perform the independent review of the project required by CEQA before the DEIR is released. The IWA has reviewed the content of the DEIR and concurs in the conclusions and findings contained herein.

1.2 INTENDED USE OF THIS ENVIRONMENTAL IMPACT REPORT

This DEIR has been prepared in accordance with the California Environmental Quality Act (CEQA) Statutes and Guidelines, 2009, pursuant to Section 21151 of CEQA. The IWA is the local Lead Agency for the proposed project and has supervised the preparation of this DEIR. This DEIR is an information document prepared to inform public agency decision makers, interested parties and the general public of the potential environmental effects of implementing the proposed project, including any significant adverse environmental effects that may be caused by its implementation. This document also includes an evaluation of possible ways to minimize significant effects of the proposed project. Alternatives to the proposed project are also identified and evaluated in the DEIR. This document assesses the impacts, including unavoidable significant adverse impacts and cumulative impacts, related to the implementation of the proposed project.

1.3 PROJECT BACKGROUND

The IWA in collaboration with VSD developed a strategic goal of reclaiming wastewater for use as recycled water to reduce existing demand for potable water resources and to use some of the recycled water for recharge of the groundwater aquifer beneath the Authority's service area. Grant funding may be sought from the U.S. Bureau of Reclamation (BOR) which supports more efficient use of wastewater to partially fund the construction of the proposed facilities to meet IWA's objective of providing reclaimed water within the community to offset demand for potable water.

The following is a brief summary description of the activities proposed by the IWA Recycled Water Project being evaluated in this Draft Environmental Impact Report. The IWA proposes to treat wastewater flows from the VSD WWTP for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. Currently, VSD discharges approximately 7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel (hereafter, Channel or CVSC), which ultimately discharges into the Salton Sea approximately 13 miles downstream of the VSD outlet. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of approximately 22 linear-miles pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

1.4 PROJECT OBJECTIVES

The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. The purpose of the proposed project is to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area.

1.5 IMPACTS

Based on data provided in this DEIR, IWA concluded the proposed project would not result in significant adverse environmental impacts. All of the potential environmental issues evaluated in this DEIR were determined to be less than significant impacts, either without mitigation or with implementation of the mitigation measures identified in this DEIR or the attached Initial Study (Subchapter 8.1). Note that the cumulative significant impacts are evaluated and determined in this document to also be less than significant impacts, based on a determination that the proposed project's contributions to such impacts are evaluated as being less than cumulatively considerable, which is the threshold identified in Section 15130 of the State CEQA Guidelines. Table 1.5-1 summarizes the environmental impacts and proposed mitigation measures for the environmental issues evaluated in this DEIR.

The following issues have been determined to experience **less than significant impacts** in the Initial Study (Subchapter 8.1), with or without mitigation.

Aesthetics/Visual: Due to the installation of future above-ground wastewater facilities in already developed locations, no potential for significant aesthetic/visual impacts was forecast to occur from implementation of the proposed Project. Two mitigation measures were identified to minimize the potential to degrade existing visual setting and night-lighting impacts. With implementation of these mitigation measures the project-related aesthetic/visual impacts can be reduced to a less than significant impact level.

Agricultural Resources: Due to the developed nature of the project areas and lack of agricultural resources, no potential for significant agricultural resource impacts was forecast to result from implementation of the proposed Project. No mitigation was identified.

Geology and Soils Resources: Due to the location of the proposed project within a seismically active area, a potential for significant geology and soils resources impacts from implementation of the Project were identified in the Initial Study. A total of five mitigation measures were identified to minimize geology and soils resources impacts. With implementation of these mitigation measures, the project-related geology and soils resources impacts can be reduced to a less than significant impact level.

Hazards and Hazardous Materials: A potential for significant hazards and hazardous materials issue impacts were forecast to result from implementation of the proposed project. During construction a potential exists to accidentally spill petroleum products and a potential exists to expose unknown subsurface contamination during grading activities. Two mitigation measures were identified to ensure that these potential hazards would be controlled to a less than significant impact level.

Land Use and Planning: The proposed project will not alter any existing land uses. It will support existing land uses and reduce the amount of overdraft currently occurring with the area groundwater aquifer. No contribution to significant growth inducement was identified in relation to the proposed project. No mitigation was identified.

Mineral Resources: Limited mineral resource occur in the project area and the installation of future recycled water facilities was determined to pose a less than significant impact to such resources without mitigation.

Population and Housing: The Initial Study evaluation did not identify any direct or indirect effects on population or housing resources. No mitigation was required.

Public Services: The Initial Study concluded that implementation of the proposed project would not significantly impact fire protection, police protection, schools, other public facilities. It is anticipated that treatment facilities may be located at existing park and recreation areas and mitigation was included to offset the potential significant loss of any recreation area or recreation values at these locations. Therefore, with this mitigation measure public service impacts were found to be less than significant.

Recreation: The proposed project includes development at existing recreational facilities; however, the Initial Study concluded that the installation of future water infrastructure facilities was determined to pose a less than significant impact to such resources with mitigation to offset loss of recreation area or value.

Transportation/Traffic: The Initial Study concluded that implementation of the proposed project would not significantly impact any airports or air traffic patterns. Therefore, potential air traffic transportation impacts were found to be less than significant without mitigation. Since transportation system facilities occur throughout much of the project area and the installation of future wastewater infrastructure facilities can directly impact roadways or traffic on such roadways, a potential for significant transportation/traffic impacts from implementation of the was identified in the Initial Study (Subchapter 8.1). A total of five mitigation measures were identified to minimize future project related transportation/traffic system impacts. With implementation of these mitigation measures, the project-related transportation/traffic impacts can be reduced to a less than significant impact level.

Utilities and Service Systems: The Initial Study concluded that implementation of the proposed project would not significantly or adversely impact any water supply or solid waste management issues. Therefore, potential water and solid waste service system impacts were found to be less than significant without mitigation. Since the installation of future treatment infrastructure facilities may result in impacts to existing stormwater flows, a potential for significant drainage system impacts from implementation of project construction activities was identified in the Initial Study. Temporary stormwater management measures will be implemented during construction of the proposed facilities to minimize future project related stormwater runoff/drainage system impacts. In addition, since the proposed project includes the construction of new wastewater treatment facilities (expansion of the existing regional facilities), the construction of these facilities which may cause significant environmental effects, this issue was determined to generally require further analysis in the DEIR. These issues are addressed under the Hydrology/Water Quality Subchapter of the DEIR (Subchapter 4.4) of Chapter 4.

The following issues have been determined to experience **less than significant impacts** in the Draft Environmental Impact Report (DEIR), Chapter 4, with mitigation.

Air Quality: After detailed evaluation of the potential for the proposed project to impact air quality, the DEIR evaluation concluded that these impacts could be mitigated to a less than significant impact level. A total of five mitigation measures were identified to minimize future project related air quality impacts within the project area. With implementation of these mitigation measures, the project related air quality impacts can be reduced or controlled to a less than significant impact level.

Biological Resources: After detailed evaluation of the potential for the proposed project to impact biological resources, including conflict with habitat conservation plans, the DEIR evaluation concluded that these impacts could be mitigated to a less than significant impact level. A total of thirteen mitigation measures were identified to minimize future project related biology resource impacts within the project area. With implementation of these mitigation measures, the project related biology resource impacts can be reduced or controlled to a less than significant impact level.

Cultural Resources: After detailed evaluation of the potential for the proposed project to impact cultural resources, the DEIR evaluation concluded that these impacts could be mitigated to a less than significant impact level. A total of five mitigation measures were identified to minimize future project related cultural resource impacts within the project area. With implementation of these mitigation measures, the project related cultural resource impacts can be reduced or controlled to a less than significant impact level.

Hydrology and Water Quality: After detailed evaluation of all hydrology/water quality issues in the DEIR, it was concluded that all hydrology and water quality impacts can be controlled to a less than significant impact level. Detailed assumptions regarding future wastewater management activities are included in this finding and a total of seven mitigation measures were identified to minimize future project related impacts. With implementation of these mitigation measures, hydrology and water quality impacts can be offset or otherwise mitigated, and the hydrology and water quality impacts (including those identified under Utilities and Services Systems) have been found to be less than significant, on a project specific and cumulative basis.

Noise: After detailed evaluation of the potential for the proposed project to impact the existing noise environment, the DEIR evaluation concluded that these impacts could be mitigated to a less than significant impact level. A total of nine mitigation measures were identified to minimize future project related noise impacts within the project areas. With implementation of these mitigation measures, the project related noise impacts can be reduced or controlled to a less than significant impact level.

The analysis in the DEIR concluded that the proposed project can be implemented without causing significant adverse impacts on the environment. IWA concluded that the data, analysis and findings in Chapter 4 of the DEIR and the Technical Appendices in Volume 2 of the DEIR substantiate a finding that the proposed project can be implemented without causing project specific significant adverse environmental impacts or contributing to cumulatively considerable significant adverse environmental impacts. Refer to the detailed analysis in Chapter 4 and the Technical Appendices for the facts and findings supporting this conclusion.

1.6 ALTERNATIVES

The California Environmental Quality Act (CEQA) and the State CEQA Guidelines require an evaluation of alternatives to the proposed action. Section 15126 of the State CEQA Guidelines indicates that the "discussion of alternatives shall focus on alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of not significant...." In this case no environmental issues are identified as causing potential or actual significant adverse impacts if the project is implemented as proposed. The State Guidelines also state that "a range of reasonable alternatives to the project....which could feasibly attain the basic objectives of the project" and "The range of alternatives required in an EIR is governed by "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice." For this project, the four alternatives to the proposed project have been identified and evaluated, including the mandated No Project Alternative.

The project evaluated in this EIR is the IWA proposal to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City of Indio and for possible groundwater recharge of the underlying aquifer.

One of the alternatives that must be evaluated is the "no project alternative," regardless of whether it is a feasible alternative to the Project, i.e., would meet the project objectives or requirements. Under this alternative, the environmental impacts that would occur if the Project is not approved and implemented are identified. In addition to the no project alternative, a location alternative is often appropriate to incorporate. However, given that the proposed project is the advanced treatment of wastewater and provision of recycled water for large-scale irrigation and groundwater recharge, alternative locations are not readily available. The tertiary treatment facilities for irrigation must be located within the VSD facility because that is where the first stages of wastewater treatment occur and because there is room within the existing compound to accommodate the additional facilities necessary for tertiary treatment. Any alternative location for tertiary treatment would likely increase the impacts associated with the project because treated effluent would have to be conveyed to a new location for tertiary treatment, and both the conveyance and the site disturbance effects at an alternative locations would have greater impacts than would occur by co-locating the tertiary treatment with the existing treatment facilities. Alternative pipeline routes would only be reasonable to consider to the extent that the alignments reach the sites where the large-scale irrigation demands occur. Several alternative pipeline routes and satellite treatment facilities are already included in the document for consideration.

The comparative analysis of the No Project Alternative to the proposed project indicates that the No Project Alternative is environmentally superior with regards to five issues (aesthetics, biological resources, hazards & hazardous materials, noise and transportation & circulation), the two alternatives are neutral with regards to five issues (cultural resources, geology & soils, land use & planning, mineral resources and population & housing), and the proposed project is environmentally superior with regards to six issues (agricultural resources, air quality, hydrology & water quality, public services, recreation, utilities & service systems). The proposed project is not forecast to be an environmentally superior option for all issues that are considered, in particular the potential biological resource impacts of the proposed project, though mitigable, are greater than those of the No Project Alternative. However, the proposed project is not forecast to cause significant adverse environmental noise impacts after implementation of the identified mitigation measures. Implementing the No Project Alternative would eliminate these

forecast less-than-significant effects, but would also not reduce the dependency of the area on groundwater from an aquifer in overdraft or improve the reliability of the area water supply. Because the No Project Alternative would not achieve the project benefits outlined in Chapter 3 of this DEIR, it is not considered a feasible or reasonable alternative for implementation in place of the proposed project.

1.7 SUMMARY TABLE OF IMPACTS

The DEIR Chapter 1 Environmental Impact Summary table (Table 1.5-1) follows. Also, please refer to Chapter 2 for the required discussion of areas of controversy associated with the proposed project (Subchapter 2.2.5) and a discussion of issues that remain to be resolved (Subchapter 2.2.4).

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Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Air Quality	Construction activities will generate short-term air emissions over a period of years as individual project facilities are installed.	4.2-1 Using best available control measures during soil disturbance. The menu of enhanced dust control measures includes the following: • Limit the disturbance "footprint" to as small an area as practical. • Water all active construction areas at least twice daily. • Cover all off-site haul trucks or maintain at least 2 feet of freeboard. • Pave or apply water four times daily to all unpaved parking or staging areas. • Sweep or wash any site access points within 30 minutes of any visible dirt deposition on any public roadway. • Cover or water twice daily any on-site stockpiles of debris, dirt or other dusty material. • Suspend all operations on any unpaved surface if winds exceed 25 mph.	With our without mitigation, the construction activities are not forecast to cause significant air quality impact/degradation. Mitigation measures will be implemented to minimize the projects contribution to cumulative air quality impacts.
	Long-term emissions are primarily generated by electricity consumption. A potential for cumulative long-term significant air quality impacts was evaluated in this document.,	4.2-2 Limit allowable idling to 5 minutes for trucks and heavy equipment before shutting the equipment down. 4.2-3 Utilize equipment whose engines are equipped with diesel oxidation catalysts if available. 4.2-4 Utilize diesel particulate filter on heavy equipment where feasible. 4.2-5 Utilize Tier 3 rated diesel engines for heavy equipment.	Long-term emissions are forecast to be less than significant without mitigation and these permanent emissions fall below the federal *de minimis* thresholds established for the Salton Sea Air Basin.

Table 1.5-1
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Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Biological Resources	Significant biological resources occur within project specific locations and are supported by the wastewater discharged from the VSD WWTP. Installation of facilities and diversion of wastewater from discharge to the Whitewater Channel to recycled water uses has a potential to cause impacts to significant biological resources of the project area.	4.3-1 Within 30 days of the start of any land disturbance activities at the satellite treatment facilities location, a qualified biologist shall conduct focused surveys to determine if burrowing owl has migrated into the project area of potential effect (APE). If the species is encountered, land disturbance activities shall not commence until the biologist has implemented appropriate measures according to the CDFG and USFWS to clear the site for construction. 4.3-2 Following the pre-construction survey the biologist will make a determination: (1) if a biological monitor should be present at the site during all land disturbance activities; or (2) if no further action is required. The biologist/monitor should remain on-call during construction activities. If by chance a sensitive species is encountered during construction following the initial phases of ground disturbance, construction activities shall be halted in the vicinity of the find and the biologist/monitor called to the site. The contractor shall implement the recommendations of the biologist/monitor. 4.3-3 All personnel associated with the construction on the site shall attend a worker education class. This class shall include general information regarding sensitive species that may be found within the project area, including the burrowing owl; relevant Federal and State laws; and worker responsibilities when working in Coachella Valley desert habitat. 4.3-4 Whenever feasible, equipment shall be washed prior to reaching the site if it has been working at another job site.	After implementing the 13 mitigation measures to avoid or offset potential biological resource impacts, the DEIR concluded that these potential impacts could be reduced to a less than significant impact level at both the project specific and cumulative impact level.

Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Biological Resources (continued)		4.3-5 All project activities will be limited to a well-defined and visually delineated area. Prior to grading and construction activities, the limits of disturbance will be clearly marked with flagging, stakes, or fencing to prevent accidental intrusion into and degradation of adjacent undisturbed habitat areas. 4.3-6 A qualified biologist shall conduct qualitative habitat monitoring for a minimum of five (5) years, beginning in the spring prior to the reduction in effluent discharge to the Coachella Valley Stormwater Channel in order to provide baseline data and to document any habitat changes over time. Annual monitoring, including focused protocol LBVI and SWWF surveys, habitat mapping and general botanical and wildlife surveys, will be conducted to help identify short-term changes in the habitat conditions. Habitat mapping shall be performed in the spring, between April and July, to document the extent and quality of habitats (including structure, recruitment rates and geographic limits), species diversity, and any significant disease or pest problems. Annual vegetation monitoring shall include the establishment of sampling grids and/or transects with permanent photo stations should be set within the grids and/or transects to provide a visual photo log to track of the changes in habitat over time. Invasive exotic species shall be mapped and removed while minimizing impacts to existing native plants and wildlife species. All wildlife species detected by sight, track, or sign within the monitoring areas should be recorded. More intensive protocol level, LBVI and SWWF surveys should also be conducted by a permitted biologist.	

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Biological Resources (continued)		4.3-6 (cont.) Monitoring for this project would involve the collection and interpretation of biological resource data for five consecutive years and documentation of the effects of the action on the biological resources of concern. Any habitat loss of greater than 20 percent in spatial extent or quality, as determined by the vegetation monitoring is recommended to be offset by habitat restoration or replacement. 4.3-7 To avoid an illegal take of active bird nests, any grubbing, brushing or tree removal will be conducted outside of the State identified nesting season of February 15 through September 1. Alternatively, project impact areas will be evaluated by a qualified biologist prior to initiation of ground disturbance to determine the presence or absence of nesting birds. If an active nest is located in the project construction area it will be flagged and a 300 foot buffer placed around it. No activity will occur within the 300 foot buffer until the young have fledged the nest. 4.3-8 Prior to discharge of fill or streambed alteration of either of the channels along the project alignment, the IWA shall obtain regulatory permits from the U.S. Army Corps of Engineers, Santa Ana Regional Water Quality Control Board and the California Department of Fish and Game, where required. Mitigation can be provided by purchasing into any authorized mitigation bank; by selecting a site of comparable acreage near the site and enhancing it with a native riparian habitat or invasive species removal in accordance with a habitat mitigation plan approved by regulatory agencies; or by acquiring sufficient compensating habitat to meet regulatory agency requirements. Typically, regulatory agencies require mitigation for jurisdictional waters without any riparian or wetland habitat to be mitigated at a 1:1 ratio.	

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Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Biological Resources (continued)		4.3-8 (cont.) For loss of any riparian or other wetland areas, the mitigation ratio will begin at 2:1 and the ratio will rise based on the type of habitat, habitat quality, and presence of sensitive or listed plants or animals in the affected area. A revegetation plan using native riparian vegetation common to the project area shall be prepared and reviewed and approved by the appropriate regulatory agencies. The agencies can impose greater mitigation requirements in their permits, but the IWA will utilize the ratios outlined above as the minimum required to offset or compensate for impacts to jurisdictional waters, riparian areas or other wetlands. 4.3-9 In the event that impacts to the constructed wetland treatment ponds will impact the area around the raptor houses, subsequent botanical surveys will be conducted to determine if the Abronia species present is a special status variety. If a sensitive plant species identified in the CNDDB is positively identified on site the plant will be flagged and avoided during construction until the CDFG is notified and takes their opportunity to salvage the plant. 4.3-10 As required by the City or County plant protection ordinances, the project proponents shall avoid City or County street trees and shrubs or procure a permit prior to impacts. 4.3-11 Where future project-related impacts will impact undeveloped land, future surveys shall be conducted by a qualified biologist/ecologist. If any sensitive species have the potential to occur on the site where facilities are proposed, or if previous environmental studies have not	

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Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Biological Resources (continued)		4.3-11 (cont.) been conducted, IWA will conduct all surveys in accordance with all established state, federal and generally accepted biological survey protocols for each potential species that may be located onsite. If sensitive species are identified as a result of the survey for which mitigation/compensation must be provided in accordance with regulatory requirements, the following subsequent mitigation actions will be taken: a. IWA shall provide compensation for sensitive habitat acreage lost by acquiring and protecting in perpetuity (through property or mitigation bank credit acquisition) habitat for the sensitive species at a ratio of not less than 1:1 for habitat lost. The property acquisition shall include the presence of at least one animal or plant per animal or plant lost at the development site to compensate for the loss of individual sensitive species. b. An endowment, to be determined at the time the impact is proposed, shall be provided by the project proponent and this endowment shall be adequate to fund ongoing management requirements for the property purchased. c. The final mitigation may differ from the above values based on negotiations between the project proponent and USFWS and CDFG for any incidental take permits for listed species. The project proponent shall retain a copy of the incidental take permit as verification that the mitigation of significant biological resource impacts at a project site with sensitive biological resources has been accomplished.	

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Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Biological Resources (continued)		4.3-12 Where future project-related impacts will impact undeveloped land, site selection shall place primary emphasis on the preservation of large, unbroken blocks of natural open space and wildlife habitat area, and protect the integrity of habitat linkages. As part of this emphasis, IWA shall cluster of development to decrease habitat fragmentation, where relevant. Further, whenever feasible, IWA shall avoid impacts and disturbances to individuals and species considered sensitive by jurisdictional agencies. 4.3-13 Require facility designs to be planned to protect habitat values and to preserve significant, viable habitat areas and habitat connection in their natural conditions. a. Within designated habitat areas of rare, threatened or endangered species, prohibit disturbance of protected biotic resources. b. Within riparian areas and wetlands subject to state or federal regulations, riparian woodlands and habitat linkages require that the vegetative resources which contribute to habitat carrying capacity (vegetative diversity, faunal resting sites, foraging areas, and food sources) are preserved in place or replaced so as not to result in an measurable reduction in the reproductive capacity of sensitive biotic resources. c. Within habitats of plants listed by the CNDDB or CNPS as “special” or “of concern,” require that new facilities not result in a reduction in the number of these plants, if they are present.	

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Cultural Resources	A limited potential exists within certain project areas to expose subsurface cultural resources.	4.4-1 If unknown buried cultural resources are discovered during project construction, all work in the area of the find shall cease, and a qualified archaeologist shall be retained by the project sponsor to investigate the find, and to make recommendations on its disposition. A professional report detailing findings shall be prepared and retained under IWA direction. The IWA shall implement the archaeologist's recommendations as long as the cost does not exceed professional norms. 4.4-2 IWA shall arrange to have a professional archaeologist monitor all trenching, excavation and other earth-moving activities at the satellite treatment facility sites shown on Figure 4.4-2. If archaeological resources are discovered, excavation activities in the area of the find shall be halted until the qualified archaeologist can evaluate the nature and significance of the finds. The archaeologist will be able to assess the resource, determine its significance, and make recommendations for appropriate mitigation measures within the guidelines of the California Environmental Quality Act, if necessary. The IWA and/or contractor shall implement the management recommendations of the archaeologist for any resource exposed during construction activities. The archaeologist shall ensure proper and timely evaluation and treatment of any cultural resource materials unearthed in this area. If any cultural resources are encountered during construction monitoring, a professional report detailing findings shall be prepared and retained under IWA direction.	After implementing the five mitigation measures to avoid or properly manage any accidentally exposed subsurface cultural resources, the DEIR concluded that this potential impact could be reduced to a less than significant impact level at both the project specific and cumulative impact level.

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Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Cultural Resources (continued)		4.4-3 When excavations extend below ten feet or encounter older alluvial sediments, the contractor shall have a qualified paleontologist conduct a review of the sediments and determine whether monitoring during additional initial ground disturbance is required during continuing excavation activities. Monitoring may be periodic or continuous during excavation activities in sensitive paleontological areas. If paleontological resources are discovered, excavation activities in the area of the find shall be halted until the qualified paleontologist can evaluate the nature and significance of the finds. The paleontologist will be able to assess the resource, determine its significance, and make recommendations for appropriate mitigation measures within the guidelines of the California Environmental Quality Act, if necessary. The IWA and/or contractor shall implement the management recommendations of the paleontologist for any resource exposed during construction activities. A professional report detailing findings shall be prepared and retained under IWA direction. 4.4-4 If human remains are encountered during construction, all work shall cease pursuant to procedures set forth in Section 7050.5 of the State Health and Safety Code and no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to State Public Resources Code Section 5097.98. If the coroner determines that the burial is prehistoric, the Native American Heritage Commission must be contacted and appropriate disposition of the human remains determined. The IWA shall be notified and actions to manage the remains shall be documented in a report to the IWA.	

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Hydrology / Water Quality	The proposal to provide tertiary treatment of the VSD WWTP effluent and use the recycled water for irrigation and potential recharge to the groundwater aquifer has a potential to significantly alter surface and groundwater hydrology and to cause possible significant groundwater quality changes.	4.5-1 The construction contractor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices that will be implemented to prevent construction pollutants from contacting stormwater with the intent of keeping all products of erosion from moving offsite. The SWPPP shall be developed with the goal of achieving a reduction in pollutants both during and following construction to control urban runoff to the maximum extent practicable based on available, feasible best management practices. The SWPPP and the monitoring program for the construction projects shall be consistent with the requirements of the latest version of the State's General Construction Activity Storm Water Permit and NPDES Permit No. CAS000002, Order No. 2010-0014-DWQ. The following items or comparable BMPs shall be included in the SWPPP: • The length of trenches which can be left open at any given time should be limited to that needed to reasonably perform construction activities. This will serve to reduce the amount of backfill stored onsite at any given time. • Backfill material should not be stored in areas which are subject to the erosive flows of water. • Measures such as the use of straw bales, sandbags, silt fencing or detention basins shall be used to capture and hold eroded material for future cleanup. • Rainfall will be prevented from entering material and waste storage areas and pollution-laden surfaces.	After implementing the seven mitigation measures to avoid or properly manage any potential for hydrology or water quality impact, the DEIR concluded that these potential impacts could be reduced to a less than significant impact level at both the project specific and cumulative impact level.

Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Hydrology / Water Quality (continued)		4.5-1 (cont.) • Construction-related contaminants will be prevented from leaving the site and polluting waterways. • Replanting and hydroseeding of native vegetation will be implemented to reduce slope erosion and filter runoff. • A spill prevention control and remediation plan to control release of hazardous substances. 4.5-2 The site design for IWA Recycled Water Project facilities shall prepare and implement a Water Quality Management Plan (WQMP) which specifies Best Management Practices that will be implemented to prevent long-term surface runoff from discharge of pollutants from sites on which construction has been completed. The WQMP shall be developed with the goal of achieving a reduction in pollutants following construction to control urban runoff pollution to the maximum extent practicable based on available, feasible best management practices. 4.5-3 Any future IWA Recycled Water Project facilities that will be installed at a location where flood hazards may occur must be hardened to withstand the defined flood hazard so that the facility can continue to operate or be available to be placed into immediate operation following the flooding.	

Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Hydrology / Water Quality (continued)		4.5-4 For long-term mitigation of site disturbances at IWA Recycled Water Project facility locations, all areas not covered by structures shall be covered with hardscape (concrete, asphalt, gravel, etc.), native vegetation and/or man-made landscape areas (for example, grass). Revegetated or landscaped areas shall provide sufficient cover to ensure that, after a two year period, erosion will not occur from concentrated flows (rills, gully, etc.) and sediment transport will be minimal as part of sheet flows. 4.5-5 Within each facility or project associated with the IWA Recycled Water Project that will impact more than one acre, surface runoff from upstream shall be collected and discharged in a manner downstream of the site that does not increase downstream flood hazards. Onsite surface runoff shall be collected and retained (for use onsite) or detained and percolated into the ground on the site such that site development results in no net increase in offsite stormwater flows. Detainment shall be achieved through Low Impact Development techniques whenever possible, and shall include techniques that remove the majority of urban storm runoff pollutants, such as petroleum products and sediment. The purpose of this measure is to remove the onsite contribution to cumulative urban storm runoff and ensure the discharge from the sites is treated to reduce contributions of urban pollutants to downstream flows and to groundwater. If it is not possible to eliminate stormwater flows from leaving a site, the facility shall not be constructed until a drainage study has been conducted that verifies that there will be no adverse impacts to downstream stormwater management from implementation of the site development.	

Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Hydrology / Water Quality (continued)		4.5-6 Under no circumstance shall discharge of recycled water cause or contribute to a cumulative violation of the Basin Plan maximum benefit objectives or interfere with a designated beneficial use for a water or groundwater body. In addition to monitoring, the IWA will use models to forecast future TDS and Nitrate concentrations pursuant to the Basin Plan and Title 22 permit requirements. IWA will, based on monitoring, begin the planning to develop measures to either protect beneficial uses of groundwater or to treat groundwater to meet beneficial use requirements if a violation appears imminent. 4.5-7 All water recharge operations shall be monitored, and if impacts that were not forecast to occur as a result of recycled water recharge operations cause unexpected significant adverse impact on the groundwater aquifer, the recharge operations shall be terminated or modified to eliminate the adverse impact.	
Noise	The project will generate both construction activities and permanent water management activities that can cause significant noise impacts to area sensitive noise receptors.	4.6-1 Construction shall be limited to the hours of 7 a.m. to 7 p.m. on Monday through Friday, and between 9 a.m. to 6 p.m. on Saturday, and shall be prohibited on Sundays and federal holidays, or as defined in local noise ordinances. Exceptions are for well drilling or declared emergency circumstances. 4.6-2 All construction vehicles and fixed or mobile equipment shall be equipped with properly operating and maintained mufflers. 4.6-3 All employees that will be exposed to noise levels greater than 75 dB over an 8-hour period shall be provided with adequate hearing protection devices to ensure no hearing damage will result from construction activities.	After implementing the nine mitigation measures to avoid or properly manage exposure to significant noise generating activities, the DEIR concluded that this potential impact could be reduced to a less than significant impact level at both the project specific and cumulative impact level.

Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Noise (continued)		4.6-4 If equipment is being used that can cause hearing damage at adjacent noise receptor locations (distance attenuation shall be taken into account), portable noise barriers shall be installed that are demonstrated to be adequate to reduce noise levels at receptor locations below hearing damage thresholds. 4.6-5 All production lift stations, booster pumps or other facilities shall have their noise levels attenuated to 50 dBA CNEL at the adjacent property boundary, when noise sensitive uses occur on such property, or in accordance with a local noise ordinance. 4.6-6 When possible, construction shall utilize methods or equipment that will provide the lowest level of noise impact, i.e., use newer equipment that will generate lower noise levels. 4.6-7 Efforts shall be made to maintain good relations with the local community where construction is scheduled, such as keeping people informed of the schedule, duration, and progress of the construction, to minimize the public objections of unavoidable noise. Communities should be notified in advance of the construction and the expected temporary and intermittent noise increases during the construction period.	

Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

Environmental Category / Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Noise (continued)		4.6-8 Construction staging areas shall be located as far from adjacent sensitive receptor locations as possible at each facility. 4.6-9 The IWA will establish a noise complaint/response program and will respond to any noise complaints received for this project by measuring noise levels at the affected receptor. If the noise level exceeds an Ldn of 65 dBA exterior or an Ldn of 45 dBA interior at the receptor, the applicant will implement adequate measures to reduce noise levels to the greatest extent feasible, including portable noise barriers or scheduling specific construction activities to avoid conflict with adjacent sensitive receptors.	

Table 1.5-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES DISCUSSED IN THIS DRAFT EIR

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CHAPTER 2 – INTRODUCTION

2.1 BACKGROUND

The Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City of Indio and for possible groundwater recharge of the underlying aquifer. Currently, VSD discharges (NPDES permit – CA00104477/Order No R7-2010-0010) approximately 7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel (hereafter, Channel), which ultimately connects to the Salton Sea approximately 13 miles downstream of the VSD outlet. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand. Please refer to Figure 1 for a regional location map and Figure 2 for a map depicting the City of Indio boundaries and VSD facility locations.

IWA will serve as the lead agency on this project for CEQA purposes. The purpose of the proposed project is to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area.

2.2 PURPOSE AND USE OF AN EIR

The California Environmental Quality Act (CEQA) was adopted to assist with the goal of maintaining the quality of the environment for the people of the State. Compliance with CEQA, and its implementing guidelines, requires that an agency making a decision on a project must consider its potential environmental effects/impacts before granting an approval. Further, the state adopted a policy "that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects." Thus, an agency, in this case the Indio Water Authority, must examine feasible alternatives and identify feasible mitigation measures as part of the environmental review process. CEQA also states "that in the event specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects may be approved in spite of one or more significant effects thereof." (§ 21002, Public Resources Code)

When applied to a specific project, such as the construction and operation of the IWA Recycled Water Project, the reviewing agency, the IWA, is required to identify the potential environmental impacts of the project. Where potential significant impacts are identified the agency must determine whether there are feasible mitigation measures or alternatives that can be implemented to avoid or substantially lessen significant environmental effects of a project. The first step in this process, completion of an Initial Study to determine whether an EIR is required, has been completed for the IWA Recycled Water Project, the "project being considered for approval and implementation" by the IWA. Based on the information in the Initial Study, IWA concluded that potential impacts associated with implementation of this project were less than

significant or could be mitigated to a less than significant level with implementation of mitigation measures provided for all issues evaluated except; ***Air Quality, Biological Resources, Cultural Resources, Hydrology and Water Quality and Noise***. For the issues of geology/soils, land use, and utilities/service the impacts associated with many issues were determined to be less than significant both individually and cumulatively without mitigation or in some instances within geology/soils with implementation of identified mitigation, but each issue also contained items that require further consideration in the EIR. The potential for liquefaction-related hazards, included in the Geology and Soils section of the Initial Study checklist, will be evaluated in conjunction with hydrology and water quality impacts in the EIR. The issue within land use that requires further study is the impact of the project on habitat conservation plans and natural community conservation plans, which will be evaluated in conjunction with the biological resources section of the EIR. The issues within utilities/service systems that require further study are wastewater discharge requirements, stormwater facilities, and brine discharge, all of which will be evaluated in conjunction with the hydrology/water quality section of the EIR. Based on the analysis and findings presented in the Initial Study, all other geology/soil, land use, and utilities/service issues were found not to require further evaluation as part of the EIR. Potential impacts associated with the issues identified above were determined to have the potential to result in significant adverse impacts to the environment based on the preliminary analysis. Therefore, these issues will be the topics evaluated in the EIR to be prepared for this project.

IWA prepared and circulated a Notice of Preparation (NOP) for the project. The NOP review period began on July 6, 2010 and ended thirty days later on August 4, 2010. Respondents were requested to send their suggestions for and comments on environmental information and issues that should be addressed in the EIR no later than thirty days after receipt of the NOP. The NOP, along with the Initial Study, was distributed to interested agencies, the State Clearinghouse, and other parties of interest. Six letter responses to the NOP were submitted. Copies of these six letters are included in Section 8.2 of this document. A summary of issues and responses to the comments raised is provided in the following section.

A scoping meeting was held on August 3, 2010 at 4 PM in the City of Indio Council Chambers located at 100 Civic Center Mall, Indio, CA 92201. A summary of the scoping meeting comments is also provided in the following section.

This EIR has been prepared to address the issues identified above and provide an informational document intended for use by IWA, the City, interested and responsible agencies and parties, and the general public in evaluating the potential environmental effects of implementing this project. A copy of the Initial Study is attached as Section 8.1 in Chapter 8 and a copy of the NOP and comment letters are provided in Chapter 8, Section 8.2 of this EIR.

CEQA requires that the IWA, the CEQA Lead Agency, consider the environmental information in the project record, including this EIR, prior to making a decision on the proposed project. The decision that will be considered by the IWA is whether to approve the Project for implementation, or to reject the proposed project. This EIR evaluates the environmental effects on ***Air Quality, Biological Resources, Cultural Resources, Hydrology and Water Quality and Noise***.

IWA will serve as the CEQA Lead Agency pursuant to the State CEQA Guidelines Section 15051(b)(1). This EIR has been prepared by Tom Dodson & Associates (TDA) under contract to IWA. TDA was retained to assist IWA to perform the independent review of the project

required by CEQA before the EIR is released. IWA has reviewed the content of the EIR and concurs in the conclusions and findings contained herein.

2.2.1 Summary of Responses to the NOP

The following is a summary of the content of the comment letters submitted in response to the NOP and the IWA responses:

- **Comment Letter #1 from the State Clearinghouse and Planning Unit, July 6, 2010**

This notification letter is provided to responsible or interested agencies as a reminder to comment on the NOP within the stipulated time frame. The State Clearinghouse distributed the NOP to state agencies and assigned the project tracking number SCH#2010071019. No response is necessary.

- **Comment Letter #2 from the California Regional Water Quality Control Board, July 16, 2010**

Comment 1: The California Regional Water Quality Control Board (RWQCB) states that the EIR should consider potential impacts of the project to the Beneficial Uses of the Coachella Valley Storm Water Channel (CVSC) and the Salton Sea.

Response: The EIR considers potential impacts of the project to the Beneficial Uses of the Coachella Valley Storm Water Channel (CVSC) and the Salton Sea in Subchapters 4.3 Biological Resources and 4.5 Hydrology and Water Quality.

Comment 2: The RWQCB states that the EIR should consider impacts of the project to wetlands in the CVSC and the EPA and State of California's policy of "No Net Loss of Wetlands," including providing alternatives and/or mitigation if necessary.

Response: The EIR considers impacts of the project to wetland in the CVSC and the EPA and State of California's policy of "No Net Loss of Wetlands" in Subchapter 4.3 Biological Resources.

Comment 3: The RWQCB cites Code that requires that any change in the point of discharge, place of use or purpose of use of treated wastewater associated with implementation of the proposed project be approved by the Division of Water Rights of the RWQCB.

Response: Your comment is noted. Any change in the point of discharge, place of use or purpose of use of treated wastewater associated with implementation of the proposed project will be submitted to the Division of Water Rights of the RWQCB for approval.

- **Comment Letter #3 from the Native American Heritage Commission, July 20, 2010**

Comment 1: The California Native American Heritage Commission (NAHC) identified its responsibilities under state law to identify and protect Native American Cultural Resources. The letter states that while the Commission did not identify any known Native American Cultural Resources within the project area of potential

effect in a review of the Sacred Lands File; such resources are known to occur in close proximity to the project. The letter recommends consultation with area tribes, use of Native American monitors where appropriate and consultation with the Office of Historic Preservation.

Response: Thank you for the information; it will be provided to the decision makers for consideration. A detailed cultural resources analysis, including consultation with Native American Tribes, was conducted as part of the evaluation process for this EIR and is provided in Volume 2, Technical Appendices to the EIR.

Comment 2: NAHC states that Lead Agencies should consider avoidance of significant cultural resources and provides Code sections regarding the requirements for handling accidental discovery of any human remains.

Response: The environmental analysis of impacts to cultural resources includes consideration of avoidance of significant cultural resources, and outlines the legal requirements of the project in the event of accidental discovery of human remains.

Comment 3: The NAHC provided guidelines for identifying and preserving cultural resources if encountered. A list of Native American contacts was also provided.

Response: Thank you for the information; it will be provided to the decision makers for consideration. The detailed cultural resource analysis followed accepted professional standards for identifying sensitive resources, including those outlined in your comment.

Comment 4: NAHC reiterates and cites additional Code sections with language regarding the requirements for handling accidental discovery of any human remains.

Response: The environmental analysis of impacts to cultural resources outlines the legal requirements of the project in the event of accidental discovery of human remains.

Comment 5: NAHC restates that Lead Agencies should consider avoidance of significant cultural resources.

Response: The environmental analysis of impacts to cultural resources includes consideration of avoidance of significant cultural resources.

- **Comment Letter #4 from the City of La Quinta, July 22, 2010**

Comment 1: The City states that it has no comment at this time, but requests a copy of the DEIR once it is available.

Response: Thank you for your comment. A copy of the DEIR will be provided upon availability.

- **Comment Letter #5 from the California Department of Public Health, July 29, 2010**

Comment 1: The Department of Public Health (DPH) summarized the proposed project.

Response: Your summary of the proposed project is accurate.

Comment 2: The DPH further summarized the proposed project, and stated that DPH has standards for regulatory, engineering, design, operational and administration of the proposed recycled water project.

Response: IWA will develop and implement its recycled water program according to the DPH's regulatory, engineering, design, operational and administrative requirements for the protection of public health.

Comment 3: The DPH has regulations and requirements for different wastewater treatment systems that are in Title 22 as well as guidance and professional organization documents.

Response: IWA will develop and implement its wastewater treatment systems in accordance with DPH's regulatory requirements iterated in Title 22 or other regulatory documents.

Comment 4: The DPH recognizes that the requirements for complying with its regulations regarding recycled water are complex and require extensive planning. Draft regulations are provided and assistance is offered in assuring compliance with the regulatory requirements.

Response: IWA has received the *Groundwater Recharge Reuse, DRAFT Regulation, August 5, 2008* document and will reference the document and work closely with the DPH while developing and implementing its recycled water program to ensure the protection of public health.

- **Comment Letter #6 from the Department of Toxic Substances Control, July 29, 2010**

Comment 1: The Department of Toxic Substances Control (DTSC) summarized the proposed project.

Response: Your summary of the proposed project is accurate.

Comment 2: The DTSC provides a list of databases that should be consulted to determine if there are conditions within the project area that may pose a threat to human health or the environment.

Response: The Initial Study/NOP Section VII Hazards and Hazardous Materials included a discussion of a review of available data (site appearance, USGS map, California Department of Toxic Substance Control's (DTSC) Envirostor Database (Including the Hazardous Waste and Substances Site List, or Cortese List, and the Leaking Underground Storage Tank Information System) and the U.S. Environmental Protection Agency (EPA) Enviromapper (including Superfund, toxic releases, water discharges, air emissions and hazardous waste handlers). Information

from the databases regarding past uses in the project area or immediate vicinity that may have involved hazardous materials was provided in the discussion and it was determined that no known hazardous sites would impact or be impacted by the proposed project. Mitigation was included to address the potential for adverse impacts associated with previously undiscovered hazardous contamination.

Comment 3: DTSC states that the EIR should identify a mechanism to initiate any required investigation and/or mitigation of an area impacted by the project that maybe contaminated. Any investigation and/or remediation for any portion of the site that may be contaminated should be conducted under a Workplan approved and overseen by the appropriate agency. Any sampling results in which hazardous substances are found above regulatory standards should be clearly summarized in a table and regulatory reports should be included in the EIR.

Response: Mitigation measure VII-2 of the Initial Study/NOP identifies a mechanism to initiate any required investigation and/or mitigation of an area impacted by the project that may be contaminated. No investigation or remediation is anticipated at this time, but if contamination is discovered, investigation and/or remediation will be conducted under a Workplan approved and overseen by the appropriate agency.

Comment 4: If building or other structures, asphalt or concrete-paved surface areas are demolished, an investigation should be conducted for the presence of hazardous chemicals, mercury and asbestos containing materials or lead-based paints. If any such materials are present, precautions should be taken during demolition and contaminant remediated in compliance with CA environmental regulations and policies.

Response: No buildings or structures are planned for demolition. Asphalt or concrete surfaces will be removed and resurfaced. Mitigation measure VII-2 of the Initial Study/NOP identifies a mechanism to initiate investigation and/or mitigation of potentially contaminated soils exposed by the project if demolition is implemented for any of the existing facilities at the VSD plant site.

Comment 5: Appropriate sampling of soil excavation and/or filling should be required prior to disposal of excavated soil or import of soil to confirm that soil is free of contamination. If soil is contaminated, it must be properly disposed of rather than relocated and Land Disposal Restrictions may be applicable. Human health and environmentally sensitive receptors shall be protected during construction and demolition activities, and a health risk assessment overseen by the appropriate government agency if there are, have been or will be any releases of hazardous materials that may pose a risk to human health or the environment.

Response: IWA will require excavated material to be tested if there is any evidence of contamination. If soil is imported, the contract acquiring the soil will require that tests be provided documenting that the soil is clean. When any facilities/surfaces are demolished, appropriate testing will be conducted (e.g., asbestos, lead) prior to demolition. If contamination exists, procedures will be implemented to prevent exposing people to health hazards. The Initial Study included mitigation measure

VII-1 requiring cleanup and appropriate disposal of any contamination released during construction in accordance with applicable state and local regulations in addition to mitigation measure VII-2, which identifies a mechanism to initiate investigation and/or mitigation of an area impacted by the project that maybe contaminated.

Comment 6: If the site was used for agricultural purposes may have occurred, onsite soils and groundwater may contain pesticide and agricultural chemical residue or related residue. Proper investigation and remedial actions, if necessary, should be conducted at the site prior to construction of the project.

Response: There is no information suggesting that the proposed project areas of impact were historically used for agriculture, and thus no information to suggest that pesticides might occur on the site. Mitigation measure VII-2 of the Initial Study/NOP identifies a mechanism to initiate investigation and/or mitigation of potentially contaminated soils exposed by the project.

Comment 7: If hazardous wastes are or will be generated by the project, wastes must be managed in accordance with California and Federal regulations. Certain hazardous waste treatment processes may require authorization from the local CUPA.

Response: No hazardous waste treatment is proposed in conjunction with this project.

Comment 8: DTSC can provide cleanup oversight and provides contact information for further information.

Response: Thank you for the information.

Comment 9: DTSC requests that future CEQA documents include an email address for correspondence.

Response: Your request that future CEQA documents include an email contact is noted and will be provided to the decision makers and those responsible for preparing CEQA documents.

- **Notes from the Scoping Meeting**

A scoping meeting was held on August 3, 2010 at 4 PM in the City of Indio Council Chambers located at 100 Civic Center Mall, Indio, CA 92201.

Anders Wistrom, the Principal Water Engineer for the District at that time, presented an overview of the proposed recycled water project. No comments were received from the public at the scoping meeting regarding the proposed project. Members of the Board asked several questions, including whether the project would result in any smell associated with the process. Mr. Wistrom stated that there would be no additional smells or odors coming out of the proposed project. Mr. Wistrom further commented that there are concerns with pharmaceutical disruptors and recycled water, and that there is ongoing research into this issue. Other questions raised by the Board were: 1) Is there a contractual obligation to discharge a certain amount of treated effluent into the channel?; and 2) What will be the phasing for the project? A

thorough discussion of the discharge of treated effluent into the channel is provided in Subchapter 4.3 Biological Resources and Subchapter 4.5 Hydrology and Water Quality. Proposed phasing of the project is detailed in Chapter 3, Project Description of this document.

2.2.2 List of Issues Found to be Less Than Significant or Less Than Significant with Mitigation Incorporated

The following issues were evaluated and found to be less than significant in the Initial Study without any mitigation:

Impacts to agricultural resources, minerals, population and housing and recreation.

The following issues were evaluated and found to be less than significant with mitigation incorporated in the Initial Study:

Impacts to aesthetics, hazards and hazardous materials, public services and transportation/traffic.

These issues were analyzed in the Initial Study (Section 8.1) and were found to be less than significant or less than significant with mitigation incorporated. Therefore, the issues listed above do not require further analysis in this EIR.

2.2.3 Areas Remaining Significant

Implementation of the proposed project has the potential to cause a significant impact for the following issues: ***Air Quality, Biological Resources, Cultural Resources, Hydrology and Water Quality and Noise***, and cumulative impacts where the project's contributions to such impacts are considered to be cumulatively considerable. For the issues of geology/soils, land use, and utilities/service the impacts associated with many issues were determined to be less than significant both individually and cumulatively without mitigation or in some instances within geology/soils with implementation of identified mitigation, but each issue also contained items that require further consideration in the EIR. The potential for liquefaction-related hazards, included in the Geology and Soils section of the Initial Study checklist, will be evaluated in conjunction with hydrology and water quality impacts in the EIR. The issue within land use that requires further study is the impact of the project on habitat conservation plans and natural community conservation plans, which will be evaluated in conjunction with the biological resources section of the EIR. The issues within utilities/service systems that require further study are wastewater discharge requirements, stormwater facilities, and brine discharge, all of which will be evaluated in conjunction with the hydrology/water quality section of the EIR. Based on the analysis and findings presented in the Initial Study, all other geology/soil, land use, and utilities/service issues were found not to require further evaluation as part of the EIR. Potential impacts associated with the identified issues were determined to have the potential to result in significant adverse impacts to the environment based on the preliminary analysis. Therefore, these issues will be the topics evaluated in the EIR to be prepared for this project.

2.2.4 Issues to be Resolved

Air Quality, Biological Resources *(including habitat conservation plans and natural community conservation plans)****, Cultural Resources, Hydrology and Water Quality*** *(including*

liquefaction-related hazards, wastewater discharge requirements, stormwater facilities, and brine discharge) ***and Noise***

The issues raised in the comments received on the Notice of Preparation and from the scoping meeting are covered in the topics that were already identified as requiring further analysis in the EIR, particularly with respect to cultural resources and water and wetland resources in the channel.

2.2.5 Areas of Any Controversy

Six comment letters were received during the NOP review period from a variety of agencies and no comments were received from the public at the scoping meeting held on August 3, 2010 in the City of Indio Council Chambers. The potentially controversial issues appear to be with respect to changes in the quantity of discharge of treated effluent that may contribute to supporting downstream water uses (wetlands, biological resources, etc.) Otherwise the letters and comments did not raise any new or controversial issues not already addressed in the Initial Study or in the EIR. Other than these potential areas of controversy, IWA has not been made aware through any means, that there is potential for controversy due to project approval or implementation beyond those identified in this paragraph.

2.3 SCOPE AND CONTENT OF THIS EIR

In accordance with Sections 15063 and 15082 of the State CEQA Guidelines, IWA prepared an Initial Study to identify the environmental resources and manmade systems that could experience significant environmental impact if the proposed project is implemented. After applying mitigation measures, IWA's Initial Study concluded that potential impacts associated with 11 of the 16 issues evaluated would be less than significant adverse impacts if the project is implemented as proposed. As discussed previously, the potential for liquefaction-related hazards, included in the Geology and Soils section of the Initial Study checklist, will be evaluated in conjunction with hydrology and water quality impacts in the EIR. The issue within land use that requires further study is the impact of the project on habitat conservation plans and natural community conservation plans, which will be evaluated in conjunction with the biological resources section of the EIR. The issues within utilities/service systems that require further study are wastewater discharge requirements, stormwater facilities, and brine discharge, all of which will be evaluated in conjunction with the hydrology/water quality section of the EIR.

This focused EIR analyzes the potential for the IWA Recycled Water Project to cause significant adverse environmental impacts to the following environmental issues/topics:

Air Quality, Biological Resources, Cultural Resources, Hydrology and Water Quality and Noise

In addition to evaluating the environmental issues listed above, this EIR contains all of the sections mandated by the CEQA and State and City CEQA Guidelines. Table 2.3-1 provides a listing of the contents required in an EIR along with a reference to the chapter and page number where these issues can be reviewed in the document. This EIR is contained in two volumes. Volume 1 contains the CEQA mandated sections and Volume 2 contains the technical appendices.

Table 2.3-1
REQUIRED EIR CONTENTS

Required Section (CEQA)	Section in EIR	Page Number
Table of Contents (Section 15122)	same	li
Summary (Section 15123)	Chapter 1	1-1
Project Description (Section 15124)	Chapter 3	3-1
Environmental Setting (Section 15125)	Chapter 4	4-1
Significant Environmental Effects of Proposed Project (Section 15126a); Environmental Impacts	Chapter 4	4-1
Unavoidable Significant Environmental Effects (Section 15126b)	Chapter 4	4-1
Mitigation Measures (Section 15126c)	Chapter 4	4-1
Cumulative Impacts (Section 15130)	Chapter 4	4-1
Alternatives to the Proposed Action (Section 15126d)	Chapter 5	5-1
Growth-Inducing Impacts (Section 15126g)	Chapter 6	6-1
Irreversible Environmental Changes (Section 15126f)	Chapter 6	6-1
Effects Found Not to be Significant (Section 15128)	Chapter 2 & 8	2-1
Organizations and Persons Consulted (Section 15129)	Chapter 7	7-1
Non-Technical Appendices	Chapter 8	8-1

2.4 EIR FORMAT AND ORGANIZATION

This EIR contains eight chapters which, when considered as a whole, provide the reviewer with an evaluation of the potential significant adverse impacts from implementing the proposed project, such as the construction and operation of the IWA Recycled Water Project. The following paragraphs provide a summary of the content of each chapter of this EIR.

Chapter 1 contains the Executive Summary for the EIR. This includes an overview of the proposed project and a tabular summary of the potential adverse impacts and mitigation measures.

Chapter 2 provides the reviewer with an Introduction to the document. This chapter of the document describes the background of the proposed project, its purpose, and its organization. The CEQA process to date is summarized and the scope of the EIR is identified. The format and availability of the EIR are provided.

Chapter 3 contains the project description used to forecast environmental impacts. This chapter describes for the reviewer how the existing environment will be altered by the proposed project. This chapter sets the stage for conducting the environmental impact forecasts contained in the next several chapters.

Chapter 4 presents the environmental impact forecasts for the issues considered in this EIR. For each of the environmental issues identified in Section 2.3, the following impact evaluation is provided for the reviewer: the project's existing environmental setting; the potential impacts forecast to occur if the project is implemented; proposed mitigation measures; unavoidable adverse impacts; and cumulative impacts.

Chapter 5 contains the evaluation of alternatives to the proposed project. Included in this section is an analysis of the no project alternative and other project alternatives.

Chapter 6 presents the topical issues that are required in an EIR. These include: any significant irreversible environmental changes; and growth inducing effects of the project. As of January 1, 1995, the assessment of short-term benefits relative to long-term impacts is no longer required because it is considered redundant to other sections in an EIR. This change was adopted as part of SB 749 (Thompson) which became law in January 1995.

Chapter 7 describes the resources used in preparing the EIR. This includes persons and organizations contacted; list of preparers; and bibliography.

Chapter 8 contains those non-technical materials referenced as appendices to the EIR, such as the Initial Study and Notice of Preparation. Appendix material is referenced at appropriate locations in the text of the EIR.

2.5 AVAILABILITY OF THE IWA RECYCLED WATER PROJECT EIR

The Draft EIR for this project has been distributed directly to all public agencies and interested persons identified in the NOP mailing list (see Section 8.1, Chapter 8), the State Clearinghouse, as well as any other requesting agencies or individuals. All reviewers will be provided 45 days to review the Draft EIR and submit comments to the Indio Water Authority for consideration and response. The Draft EIR is also available for public review at the following locations during the 45-day review period:

Indio City Hall, Public Counter
100 Civic Center Mall
Indio, CA 92201

Indio Public Library
200 Civic Center Mall
Indio, CA 92201
(760) 347-2383
(760) 347-3159 FAX

2.6 REVIEW PROCESS

After receiving comments on the Draft EIR, the Indio Water Authority will prepare a Final EIR for certification by the City Council prior to making a decision on the project. Information concerning the EIR public review schedule and Indio Water Authority meetings for this project can be obtained by contacting:

Ms. Debra Kaye, General Manager
Indio Water Authority
83-101 Avenue 45
Indio, CA 92201
Tel: (760) 625-1808 ● Fax: (760) 391-6433 ● E-mail: dkaye@indio.org

Other agency approvals (if required) for which this environmental document may be utilized include:

Portions of the proposed project activities would impact flood control channels. The Coachella Valley Stormwater Channel and the Coachella Canal are maintained by the Coachella Valley Water District. An encroachment permit may be required for work in either channel.

Implementation of this project will require procuring permits from the California Department of Public Health.

Implementation of this project will require the submittal of a Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) for a NPDES (National Pollution Discharge Elimination System) general construction stormwater discharge permit. This permit is granted by submittal of an NOI to the SWRCB, but is enforced through a Storm Water Pollution Prevention Plan (SWPPP) that identifies construction best management practices for the site. In the project area, the Colorado River Regional Water Quality Control Board (RWQCB) enforces the best management practice requirements described in the NPDES permit by ensuring construction activities adequately implement a SWPPP. Implementation of the SWPPP is carried out by the construction contractor, with the RWQCB providing enforcement oversight.

The project includes the potential discharge of fill into or alterations of “waters of the United States” and stream beds of the State of California. Regulatory permits to allow these fill and/or alteration activities will be required from the Army Corps of Engineers (ACOE), the RWQCB, and California Department of Fish and Game (CDFG). A Section 404 permit for the discharge of fill material into “waters of the United States will be required from the ACOE; a Section 401 Water Quality Certification will be required from the RWQCB; and a 1600 Streambed Alteration Agreement will be required from the CDFG.

The U.S. Fish and Wildlife Service (USFWS) and CDFG may be consulted regarding threatened and endangered species that may occur within project areas of potential effect (APE). Encroachment permits may be required from the City of Indio and Riverside County for installation of facilities within their right-of-way.

No other permits have been identified for the development of this site.

CHAPTER 3 – PROJECT DESCRIPTION

Note: All Chapter 3 figures are located at the end of this chapter, not immediately following reference in text.

3.1 INTRODUCTION

This chapter contains a detailed description of the proposed project with focus on those characteristics and activities that can cause physical changes in the environment. The Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City of Indio and for possible groundwater recharge of the underlying aquifer. Please refer to Figure 3-1, Regional Location Map and Figure 3-2, Project Vicinity Map. As discussed in Chapter 2, the project description focuses on the facilities and activities that would be implemented if the proposed project is approved.

Relying on data contained in the Initial Study, the IWA determined that development and operation of the facilities allowed by project approval had the potential to result in significant adverse impacts to the physical environment for five issues (*Air Quality, Biological Resources, Cultural Resources, Hydrology and Water Quality and Noise*.) No changes to the proposed scope of the Environmental Impact Report (EIR) were deemed necessary based on responses to the Notice of Preparation (NOP). Thus, this EIR has been prepared to address the physical changes to the environment authorized by project approval relative to these issues that the IWA would permit to occur, if the proposed project is approved. The IWA will serve as the Lead Agency for purposes of complying with the California Environmental Quality Act (CEQA) based on its responsibility for review and decision regarding the funding and acquisition of property required before the project can proceed to be developed.

3.2 PROJECT OBJECTIVES

The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. The purpose of the proposed project is to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area.

3.2.1 Environmental Setting

The project area is located in a fully developed urban/suburban setting in the Coachella Valley, a northwest-southeast trending desert valley that constitutes the western end of the Colorado Desert. Dictated by this geographic setting, the climate and environment of the region are typical of southern California's desert country, marked by extremes in temperature and aridity. Temperatures often reach over 120˚F in summer, and dip to near freezing in winter. Average annual precipitation is less than five inches, and the average annual evaporation rate exceeds three feet.

3.2.2 Project Location

The project can be found in the Cities of Indio and La Quinta and unincorporated portions of the County of Riverside, California within Township 5 South, Range 7 East and Township 5 South, Range 8 East, San Bernardino Baseline and Meridian on the U.S. Geological Survey (USGS) – Indio, Myoma, La Quinta, and West Berdoo Canyon Quadrangles, 7.5 Minute Series topographic maps.

Most of proposed infrastructure would be located within existing roads, parking lots or wastewater treatment compounds, although a few undeveloped fields and a dirt access road are also present within the proposed project area of impact. Four City of Indio or IWA-owned sites located along or north of 42nd Avenue are currently under consideration for the proposed satellite treatment facility site. Posse Park, which is owned by the IWA, is one of the possible sites, with another parcel located immediately north of Posse Park across a channel and the two remaining parcels located on the south and east sides of Indio Municipal Golf Course. All four sites are vacant and located within mixed residential and recreational use lands. Please refer to Figure 3-1 for a regional location map and Figure 3-2 for a map depicting the City of Indio boundaries and VSD facility locations. The only portion of the proposed project that would be located on unincorporated County land is the easternmost segment of pipeline proposed along Dillon Road. The only portion of the project that would be located within the City of La Quinta would be the westernmost portion of pipeline along 44th Avenue that would serve Bermuda Dunes Golf Course. The final locations for several aspects of the project related to groundwater recharge have not been selected. This document evaluates those prospective locations that have been identified, but additional sites may be added in the future using follow-on environmental documentation.

3.3 PROJECT CHARACTERISTICS

The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. Currently, VSD discharges (NPDES permit – CA00104477/Order No R7-2010-0010) approximately 7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel (hereafter, Channel or CVSC), which ultimately discharges into the Salton Sea approximately 13 miles downstream of the VSD outlet. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of approximately 22 linear-miles pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

The Channel northwest of the VSD WWTP discharge is dry except during periods of intense rainfall, which are rare given that the area averages only 3-5 inches of rain per year. The Channel southeast of the VSD outlet supports riparian vegetation due to the combined flows from stormwater runoff, VSD WWTP, Coachella Valley Water District (CVWD) WWTP, the City of Coachella Sanitary District and irrigation flow returns from agricultural fields. The Water Balance Study prepared by Thomas Harder & Company for the proposed project details the

flows into the Channel (please refer to Appendix 4) which are summarized as follows. USGS gauges provide historical data as to the flows upstream of VSD (2,700 AF/yr) and near the Salton Sea (79,000 AF/yr). As mentioned previously, VSD WWTP discharges approximately 7,000 AF/yr of treated effluent, and CVWD WWTP treats over 5,000 AF/yr of effluent but discharges an undefined quantity into the Channel because much is diverted to other uses. At most, approximately 15,000 AF/yr of Channel flows are attributable to the combined flows from VSD and CVWD WWTP's and stormwater with the remaining 64,000 AF/yr of Channel flows passing the gauge near the Salton Sea attributable to the City of Coachella Sanitary District and unmetered irrigation returns.

The Water Balance Study estimated that approximately 3 percent (2,200 AF/yr) of total flows of surface water are lost due to evapotranspiration between the VSD outlet and the Salton Sea and that only 16 AF/yr of VSD flows percolate into the groundwater aquifer under present conditions.

As proposed, a large portion of the tertiary treated effluent from the VSD WWTP would ultimately be diverted for recycled water projects leaving 0.5 million gallons per day (MGD) to maintain riparian vegetation supported by the VSD WWTP discharge flows in the Channel. Under existing conditions the constructed wetlands treatment system located at the WWTP site currently processes approximately 1 MGD of treated effluent which is mixed with effluent from the WWTP system and discharged to the Channel. With implementation of the proposed tertiary treatment facilities to the VSD WWTP, the existing wetlands treatment ponds would not be necessary for wastewater treatment and could potentially be eliminated.

The closest downstream agricultural irrigation return flow into the Channel occurs approximately 1.5 miles from VSD based upon a review of aerial photos. VSD treated effluent comprises the primary flows supporting riparian vegetation in the first 1.5 miles downstream from the outlet, but these flows contribute a progressively smaller portion of Channel flows with increasing distance as the majority of downstream Channel flows are attributed to irrigation return flow or City of Coachella Sanitary District flows. The minimum quantity of VSD flows that will be required to maintain riparian vegetation in the Channel has not been firmly established but has been estimated at about 0.5 MGD. It is therefore estimated that the current average flow rate of treated effluent available for recycled water use is 3.3 MGD with peak flow rates estimated to be as high as 4 MGD.

The Market and Demand Assessment Technical Memorandum prepared by Carollo Engineers dated January 11, 2010 (please refer to Appendix 6) assessed large scale irrigation sites within or adjacent to the City of Indio and estimated the potential market demand for recycled water. The Assessment concluded that the potential customer demand from parks, golf courses, polo clubs, schools and home owner associations would exceed the supply of recycled water even with the projected increased effluent flows expected at build-out of the IWA service area. Table 3-1 shows estimates of potential recycled water flows based upon current as well as build-out conditions. The Market and Demand Assessment queried potential recycled water users on interest in receiving recycled water and regarding current water sources and consumption. While not all large scale water consumers were reached, and not all that were reached were interested in receiving recycled water, the quantity of potentially available recycled water flows under current conditions (6,722 AF/yr) is much less than the potential demand (15,387 AF/yr) if all large water users were to switch to recycled water if available, as shown in Table 3-1.

Table 3-1
RECYCLED WATER SUPPLY COMPARED WITH POTENTIAL IRRIGATION DEMAND

Flow Condition	Current MGD	Current AF/yr	Ultimate MGD	Ultimate AF/yr
Average Annual Flow Rate from VSD WWTP	6.5	7,282	16	17,925
Wetlands Treatment(1)	1	- - -	0	- - -
Assumed Minimum VSD WWTP Discharge to the Channel	0.5	- - -	0.5	- - -
Available Average Recycled Water Irrigation Flow Rate	6.0	6,722	15.5	17,365
Estimated Peak Daily Recycled Water Irrigation Flow Rate (Average * 1.2)(2)	7.2	- - -	15.6	- - -
Potential Average Annual Irrigation Water Demand	- - -	15,387	- - -	15,387

Notes:
1. The existing wetlands treatment facility could be eliminated after adding tertiary treatment facilities to the VSD WWTP.

2. Peak irrigation flow rates are a function of the specific customers that are scheduled to use water at any given time, and would need to be managed within the limits of both water supply and water delivery infrastructure.

Source: Technical Memorandum No. 1 – Market and Demand Assessment, January 2010

Most of the golf courses that the project proposes to serve receive irrigation water from private wells, the All American Canal or a mixture of the two sources (Water Master Plan Update 2007). Indio Municipal Golf Course receives irrigation water from IWA as do most of the city parks and local schools. The IWA Water Master Plan Update indicates that neighboring jurisdictions (CVWD and City of Coachella) propose to treat Canal water for potable use and the IWA 2005 Urban Water Management Addendum dated 2008 indicates that IWA is evaluating both the treatment of Canal water for urban use and the use of Canal water in lieu of groundwater for irrigating some agricultural fields.

The Recycled Water Treatment Alternatives and Delivery Corridor Options Technical Memorandum No. 4 dated January 2010 by Carollo Engineers develops preliminary recommendations regarding effluent treatment alternatives and potential pipeline routes based upon potential customers. Treatment requirements for groundwater recharge are more stringent than those required for irrigation, and the alternatives propose tertiary treatment that complies with Title 22 Standards for recycled irrigation water to be installed at VSD WWTP whereas groundwater recharge treatment would be located near the potential ASR injection wells, currently proposed for Posse Park, the Indio Municipal Golf Course or one of several other potential sites within the City. Through this design only the effluent destined for groundwater recharge would be treated through the costlier groundwater recharge treatment system.

The exact location and configuration of the proposed ASR wells would be determined by the specific requirements of the geologic strata. In general, it is expected that any ASR well would inject recharge water into the lower aquifer. Because the existing water quality in the lower aquifer is of high quality, the water quality of recharge water and potential adverse impacts to aquifer water quality will be evaluated in this document. Further, depending upon the quantity and rate of recharge as well as the existing depth to the water table, the potential impacts of water mounding near the injection site will also be evaluated. ASR well location is also regulated by the existence of and distance to production wells to ensure a minimum distance and travel time for recharged water in accordance with regulatory requirements.

Spreading basins for recharging Coachella Canal water in Berdoo Canyon near the Citrus Ranch area adjacent to Dillon Road are under consideration as part of a separate project, which if implemented, could provide an alternative for groundwater recharge of recycled water.

3.3.1 Recycled Water Treatment Alternatives

There are several treatment options that would comply with Title 22 Standards for irrigation water: tertiary filtration, tertiary microfiltration and membrane bioreactors. Title 22 effluent requirements for each treatment option are tailored to ensure the reliability of the specific treatment option. All alternatives will require disinfection as the final treatment step.

Tertiary Filters
Tertiary filters are designed to remove total suspended solids (TSS) from secondary effluent by passing it through a filter media, which may consist of fine sand, anthracite and sand, or cloth. The filter options evaluated for this project were continuous backwash, upflow, sand filters (DynaSand®) and cloth disk filters. Tertiary filtration is a lower cost option for the production of Title 22 irrigation water and is approved in many current installations, but because tertiary filters only remove TSS, any requirement for nutrient removal would need to be accomplished in the secondary treatment process.

Both the DynaSand® and cloth media filters are available either as stand-alone package units or in a modular concrete design. The continuous backwash DynaSand® filter operates with an upflow, counter-current flow pattern and provides initial contact of unfiltered water with the dirtiest sand in the filter. The dirty sand moves downward away from the water's flow path to the air scour tube. The water's upward flow path passes through progressively cleaner filter media until it exits from the surface of the cleanest media. A typical filter cell includes the components of four filter modules within a reinforced concrete filter chamber. The filter's deep media bed allows it to handle high levels of suspended solids.

Cloth media filters are low-head systems and are designed to backwash automatically based upon water level pressure differential while maintaining continuous filtration during backwash. The typical backwash volume represents approximately 2 to 3 percent of the feed flow with a recovery time of less than 3 minutes, compared to other typical filters, which can take up to 20 minutes. The disks can be provided in tanks with various numbers of disks depending on the design flow.

If this option is selected, tertiary filters would be installed at the VSD WWTP. The facility would include a secondary effluent pump station, flocculation, tertiary filters, disinfection, recycled water storage, and a recycled water pump station. A conceptual site layout of the tertiary filtration system is presented on Figure 3-3. The secondary effluent pump station would be constructed near the existing Chlorine Contact Tank No. 3 and would pump secondary effluent to the tertiary filtration system located in the northwest corner of the treatment facility. The tertiary filtration system will be easily accommodated in the northwest corner of the site where it would not interfere with the facility's master plan expansion of the secondary facilities.

Tertiary Microfiltration
Tertiary Microfiltration (MF) membranes are an efficient technology for particle removal and pathogen control. These technologies yield finished water turbidities consistently below 0.1 NTU, independent of feed water quality. Membrane filtration is a pressure-driven process that

provides a near absolute barrier to suspended solids and microorganisms. MF membranes have a pore size ranging from 0.1 to 0.5 microns.

The MF process would provide greater flexibility for future groundwater recharge and would require less of a footprint than the tertiary filtration option. If this option is selected, the existing (abandoned) Chlorine Contact Tank No. 1 structure could be modified to function as a membrane tank. The membrane permeate would be pumped from the membrane tank to the disinfection system and recycled water pump station located on the north side of the facility near the channel and freeway (I-10) crossing. The Title 22 facility would include MF, disinfection, recycled water storage, and a recycled water pump station. A preliminary conceptual site layout of the tertiary MF system is shown on Figure 3-4.

Membrane Bioreactor
The Membrane Bioreactor (MBR) process is a biological process that uses MF or ultrafiltration (UF) membranes installed in membrane tanks to separate solids and produce a high-quality effluent. The MBR process is capable of achieving the nutrient removal requirements for effluent ammonia and nitrate to be compatible with future treatment requirements for groundwater recharge and proposed turf grass applications. Membranes used in MBR applications are typically polymeric (but may be ceramic) media with pore sizes in the range of 0.04 microns to 0.4 microns. The physical separation barrier provided by the membranes is the most effective and reliable treatment mechanism to meet recycled water requirements, and is less susceptible to process upsets.

The MBR process is a higher cost alternative, but has advantages over tertiary filtration and would require less of a footprint than the tertiary filtration option. The MBR process would provide more flexibility for future groundwater recharge and could cost effectively increase plant capacity. If this option is selected, the existing aeration basin could be converted to an MBR by modifying the existing (abandoned) Chlorine Contact Tank No. 1 structure to function as a membrane tank. The membrane permeate would be pumped from the membrane tank to the disinfection system and recycled water pump station located on the north side of the facility near the channel and freeway (I-10) crossing. The Title 22 facility would include fine screens, MBR, disinfection, recycled water storage, and a recycled water pump station. A conceptual site layout of the MBR system is shown on Figure 3-5.

3.3.2 Advanced Treatment for Groundwater Recharge

Only one treatment option is proposed for the production of recycled water for groundwater recharge. The advanced treatment system would be designed to treat water for groundwater recharge and would not be located at the VSD treatment facility, but could be located near the potential recharge location either at Posse Park or at one of several other potential locations. The system would take water from the Title 22 irrigation water distribution system for further treatment and recharge. This would allow the IWA/VSD to produce two qualities of recycled water: one for general irrigation use, and the second, a much higher water quality, for groundwater injection. Such an approach would be less costly than producing only the higher quality recycled water that could be used for either irrigation or injection.

If tertiary filters are selected for treatment of Title 22 irrigation water, the groundwater recharge treatment process would include MF or UF because it is required as pretreatment for the proposed Reverse Osmosis (RO) membrane treatment process. MF or UF design includes backwash flow, so if either were installed at the satellite advanced treatment facility rather than

at VSD WWTP, the backwash flow would either be discharged to the sewer to flow back to the treatment plant or onsite management of the backwash flow would be carried out. See further discussion of this issue below.

The RO membrane treatment process removes dissolved inorganic and organic compounds from the recycled water by forcing water through an ion selective membrane by applying a pressure in excess of the osmotic pressure. RO is considered a "high-pressure" process because it operates from 75 to 1,200 psig, depending upon the total dissolved solids (TDS) concentration of the feed water. The high pressure feeds water through the membranes thereby concentrating the dissolved solids that cannot travel through the membrane. The RO process removes salts, hardness, synthetic organic compounds, disinfection-by-product precursors, etc. However, dissolved gases such as H_2S and CO_2, and some organic pesticides pass through RO membranes.

Typical recoveries for RO plants operating on domestic wastewater are around 85 percent depending on the type and concentrations of sparingly soluble salts (calcium sulfate, calcium carbonate, silica, etc.) in the feed water. The RO process concentrates and separates components of the feed water resulting in concentrated brine that must be disposed of.

The groundwater recharge treatment facility would also include an ultraviolet (UV) advanced oxidation process (AOP) using hydrogen peroxide to provide disinfection and oxidation of micro-constituents. UV disinfection is a physical process that uses no toxic chemicals and produces no known toxic residuals or byproducts. The disinfection mechanism of UV light damages or destroys an organism's genetic material by transference of electromagnetic energy [wavelength of 254 nanometers (nm)] from a UV lamp to the genetic material, preventing the organism from replicating. The UV system would be coupled with a small dose of hydrogen peroxide, which would produce hydroxyl radicals which attack and destroy many microconstituents. This process would be followed by a chemical stabilization step to protect the distribution pipeline, finished water storage, and a finished water pump station.

The finished water would be pumped to on-site storage or to recharge wells at Posse Park or at one of several other potential locations. A preliminary conceptual layout of the groundwater recharge treatment facility is shown on Figure 3-6, which indicates that there is adequate space at this site to accommodate the facility. Figure 3-6 includes footprint requirements for MF to provide a conservative site layout.

RO Brine management options and treatment technologies would likely be expanded/enhanced as the volume of brine concentrate increases with RO expansion. Options under consideration involve sending the concentrate to a system of lined-evaporation ponds. Accumulated solids would periodically be collected from the ponds and disposed of in an appropriate local landfill. Technologies that would further treat flows to increase finished water production and decrease brine volume would likely be progressively applied as RO concentrate volume grows in order to reduce the size of the evaporation ponds required. The RO concentrate could be used to irrigate a salt tolerant grass (such as Jose Tall Wheatgrass) which would be harvested and marketed for animal feed. A tile drainage system would collect subsurface drainage from the irrigations fields and divert it to lined evaporation ponds in order to prevent percolation of brine flows into the aquifer. Other treatment processes that would reduce the volume of concentrate for final disposal include electrodialysis reversal, with or without a spray evaporation system or a mechanical vapor compression evaporation system.

A conceptual phasing of RO concentrate treatment technologies is provided in Section 4.5 Hydrology and Water Quality. Site locations for the specific infrastructure required to treat RO concentrate waste have not been selected. Treatment of the concentrate stream as envisioned would ultimately require 23-acres of lined-evaporation ponds plus additional acreage to allow areas to be off-line for maintenance, 75-acres or more of farmland with subsurface drainage to the lined-evaporation ponds, pipelines to convey the concentrate stream from the RO plant to the irrigation area, electrodialysis reversal, spray evaporation and/ mechanical vapor compression equipment. Since a specific location and design of these facilities have not been developed, they will be evaluated in a subsequent or tier 2 environmental document.

3.3.3 Recycled Water Delivery Corridor Options

The recycled water delivery system is a key component of the overall recycled water program for the IWA. Figure 3-2 shows a map of the VSD and IWA boundaries, potential large recycled water customer locations, and a conceptual backbone pipeline route. To minimize infrastructure and pumping costs, the IWA may choose to deliver water at a pressure that is sufficient only to supply golf course ponds. The golf courses would then pump from the ponds to pressurize their irrigation systems. Recycled water pipelines would then be sized to deliver up to the maximum daily flow rate and not the peak flow rate from the recycled water pumps. Smaller recycled water users such as HOAs and City parks may need to provide booster pumping facilities to pressurize their irrigation systems in order to use recycled water. A phased program would add these smaller users as the recycled water transmission mains are extended to the larger users.

The first phase of the recycled water delivery system would construct a pipeline from the VSD WWTP north across the Channel and Interstate 10 to Posse Park, or one of several nearby alternate locations, and the Indio Municipal Golf Course. IWA would establish service to City-owned facilities and would develop policies for future connections based upon this experience. A 16-inch line would provide up to 4.9 MGD and would be sufficient to supply all of the prospective customers north and east of Interstate 10. If IWA chooses to construct ASR injection wells for groundwater recharge, then the pipeline infrastructure would be in place for these wells. It is assumed that well injection would occur during low irrigation demand periods.

There are several alternatives under consideration to cross the Channel and freeway (I-10). The first alternative would utilize an existing 14-inch pipeline (studied by Mainero, Smith and Associates, 2004) within the 54-inch casing that also contains three depressed sewer lines that cross the Channel and freeway. However, the existing capacity of the three sewers would not be sufficient to convey wastewater flows from areas north of Terra Lago. If VSD provides treatment, under contract to the City, for the Dillon Road Corridor from Avenue 44 to the north, then the existing 14-inch diameter pipeline would be needed for wastewater flows or another depressed sewer line would need to be installed.

A second alternative would install the proposed pipeline by horizontal directional drilling beneath the channel and conventional jack and bore construction under Interstate 10. This option would be more expensive than converting an existing pipeline.

A third alternative that was studied by Dudek and Associates, Inc. in July of 2004 would convert an abandoned 15-inch diameter vitrified clay pipe (VCP) depressed sewer beneath the channel to a pressure pipe utilizing Duraliner™ which would result in an inside diameter of 13.5 inches. From the north side of the channel the recycled water would be transported across Interstate 10 by slip lining the abandoned 18-inch diameter VCP sewer with a 16-inch diameter fusible PVC

pipe, which has an inside diameter of 15 inches. These three alternatives will be studied further in the next phase of this project.

From Interstate 10 the 16-inch diameter transmission main would run north in Golf Center Parkway to 42nd Avenue then west to the Indio Municipal Golf Course where the pipeline would reduce to 12 inch diameter and would ultimately continue west on 42nd Avenue to Madison then north to Shadow Hills Golf Course. A stub out would also be provided at 44th Avenue for future extension of a 16-inch transmission main to Dillon Road and then north to the Citrus Ranch area for recharge with Coachella Canal water in spreading basins. Please refer to Figure 3-2. The majority of the pipeline segment proposed along Dillon Road would be located outside of the City of Indio within an unincorporated portion of the County.

The second phase of the water delivery system would install a transmission main south and west of the VSD WWTP to serve the Indian Palms Country Club, Plantation Golf Club, the polo clubs and several of the City's parks. Please refer to Figure 3-2. The 24-inch diameter transmission main would be constructed in Van Buren Street to the south of VSD WWTP and then across the railroad and Indio Boulevard by jack and bore construction. It would then continue south on Van Buren Street to Dr. Carreon Boulevard, west to Jackson Street, south on Jackson Street to 48th Avenue then west to Monroe Street. The installation would continue south on Monroe Street with a 20-inch diameter pipeline to Indian Palms Country Club, Plantation Golf Club, Empire Polo Club, and El Dorado Polo Club. Laterals could be provided to serve Jackson Park, Riverside County Fairgrounds and Carreon Park.

The third phase of the water delivery system would install a line from the intersection of Monroe Street and 48th Avenue to the Heritage Palms Golf Course and Indian Springs Country Club. Please refer to Figure 3-2. This line could also serve HOAs and parks in the area. This pipeline would be 16-inches in diameter. If the Bermuda Dunes Golf Course (located in the City of La Quinta) would be served, then the pipeline would be 20-inches in diameter. The Shadow Hills Golf Course (north of Avenue 40) and Bermuda Dunes Golf Course would be a lower priority for recycled water service because Shadow Hills Golf Course is already using recycled water, and the Bermuda Dunes Golf Course is outside of the City boundaries. However, if the IWA had sufficient recycled water available that could not be used by other potential customers, then 12-inch pipelines could be constructed to deliver water to these customers.

3.3.4 Construction Scenario

The exact types, configuration and location of future specific projects that will be constructed in support of the proposed project have not been determined. However, it is possible to foresee some of the infrastructure that is likely to be constructed and to project the maximum expected impacts that would result from construction and operation of the infrastructure. Impacts associated with specific future projects would be evaluated in subsequent CEQA evaluations to determine if the actual impacts fall within the impacts forecast by this analysis, or if they require subsequent CEQA evaluations and determinations.

It is assumed for all activities that construction would take place during 10-hour workdays for a five day workweek, but not all equipment would be operating continuously over the 10-hour daily work period. Small electric tools would be connected to the utility grid, but welders and other large electric equipment would be powered by an on-site generator. The number of construction workers and daily equipment-operating scenarios would vary according to the type and phase of construction project. It is further assumed that each worker would commute using

his or her own vehicle and the average commute would be approximately 20 miles one way. Emissions from the planting of landscape materials and screening wall construction are expected to be minimal and have not been calculated.

ASR Wells

Development of up to four new ASR wells in a single year would require the delivery and set up of the drilling rig. It is anticipated these wells would be drilled at the same time and the drilling equipment would be transported to and from each site on one occasion. For the purposes of this evaluation, it is forecast that delivery of the drilling equipment one time over a single year would result in one 50 mile round-trip at an average speed of 30 mph.

The drilling and development of each well to a depth of up to 850 feet would take approximately 45 days, of which 15 to 20 days would include 24-hour drill activity. Delivery of the well casings, pumps, motors, etc. for each well is forecast to result in about 1,000 miles being traveled by trucks averaging about 45 mph. Calculations assume two workers would each commute 40 miles round-trip to the work site. Typically, well drilling requires only minimal earth movement and/or grading. The well casings are expected to be welded and it is assumed that well development and installation would require two weeks of diesel generator support.

ASR well development has essentially the same construction impacts as production well development. The primary physical difference between ASR and production wells is that different valve options are installed according to the type of well.

Pipelines

Up to 22 miles of pipeline may be installed in support of the proposed project through 2020, an average of 2.5 miles per year (assumes 9 years). The maximum pipe length that would be installed in a single year under the proposed project would be 10 miles.

It is forecast that most of the pipe would range from 12 to 16-inch diameter. Trucks delivering the pipe and appurtenant equipment can carry an average of about 900 feet of 12 and 16-inch pipe per load and installation of up to 10 miles of pipe in a year would require about 60 truck deliveries per year. It is anticipated that the majority of the pipe and equipment would come from the Fontana, Ontario, Mira Loma area by way of the freeways. Such deliveries would result in round-trips that average about 90 miles at an average speed of about 60 mph.

Typically, up to 900 feet of pipeline trench could be excavated; the pipe installed, backfilled, and compacted each day during pipeline installation in undeveloped areas whereas only 300 ft per day can be installed in developed roadways. In either case equipment would be operated for roughly the same portion of the day and daily equipment emissions would be the same, except that undeveloped areas would not require pavement removal and reinstallation.

Ground disturbance emissions assume roughly half an acre of land would be actively excavated on a given day. It is anticipated that installation of pipeline in developed locations would require the use of a backhoe, crane, compactor, roller/vibrator, pavement cutter, grinder, haul truck and two dump trucks operating 6 hours per day; a water truck and excavator operating 4 hours per day and a paving machine and compacter operating 2 hours per day. Installation of pipeline in undeveloped locations would require the same equipment without the paving equipment (cutter, grinder, paving machine). Materials delivery would require approximately one truck per day for unimproved area and one truck every three days for improved alignment installation. This

phase of construction would require up to two truck trips per day with an estimated average round trip of 40 miles delivering construction materials and equipment (concrete, steel, pipe, etc.) Calculations assume twelve workers would each commute 40 miles round-trip to the work site, and that only one work crew is installing pipeline at a time.

The pipelines that would be installed in support of the Recycled Water Project would use push-on joints (e.g., gasketed bell-and-spigot) that do not require welding. However, the Contractor may occasionally use a portable generator and welder for equipment repairs or incidental uses. Other pipelines that may be installed in support of project implementation area expected to require similar impact support.

Reservoirs

There are no plans to construct any reservoirs as part of the project at this time; however, impacts associated with reservoir construction are included in the event that future circumstances require the construction of reservoirs to support recycled water programs.

It is forecast that for site preparation of a reservoir and access road, no more than 2 acres would be actively graded on a given day. It is anticipated that grading activities would occur over a 10-15 day period and would require one bull dozer, front end loader, water truck, grader, excavator and two dump/haul trucks operating 6 hours per day. Calculations assume eight workers would each commute 40 miles round-trip to the work site.

Construction of a reservoir would require the delivery and installation of equipment and materials. This phase of construction would result in an approximate maximum of 6 truck trips per day with an average round trip of 20 miles delivering construction materials and equipment (concrete, steel, pipe, etc.). Installation of a reservoir would occur over about 30 days and would require the use a crane, forklift, backhoe, front loader and two haul trucks operating 6 hours per day. Calculations assume six workers would each commute 40 miles round-trip to the work site.

In addition to the above construction equipment, heavy duty trucks will be employed for on-site deliveries. Smaller trucks and automobiles will be utilized for on-site supervision and employee commuting. The diesel delivery trucks were assumed to require 300 on-road miles per day.

Typically, the exteriors of reservoirs are coated with a primer and enamel coats both to prevent corrosion and for aesthetic purposes. South Coast Air Quality Management District Rule 1113, as amended, sets limits on the volatile reactive organic compounds (VOC or ROC) that can be released by coatings sold within the District. Impact estimates assume that the largest reservoir that would be constructed as part of the proposed project would be a 5 million gallon tank and that it would be coated to a 6 mil thickness.

Booster Stations

Pump or booster stations may be constructed as part of the Recycled Water Project. Installation of each pump station would require about 3 months. Site preparation would require minimal grading followed by construction of a foundation and construction of an exterior structure (typically brick to attenuate sound.) The pump would then be lifted into the structure through the open roof by a small crane and finally the roof would be installed.

It is forecast that no more than 0.5 acres would be actively graded on a given day for site preparation of each booster station. It is anticipated that grading activities would occur over a 5

day period and would require one bull dozer or motor grader operating 8 hours per day, one water truck operating 4 hours per day and one dump truck operating 4 hours per day. Calculations assume five workers would each commute 40 miles round-trip to the work site.

Construction of each pump station would require the delivery and installation of equipment and materials. This phase of construction would result in a maximum of 6 truck trips per day with an average round trip of 20 miles delivering construction materials and equipment (concrete, steel, pipe, etc.). Installation of the booster station would require the use a crane, forklift, backhoe and front loader operating 4 hours per day. Calculations assume five workers would each commute 40 miles round-trip to the work site.

It is expected that pump stations installed as part of the project would be located at sites with permanent power available that would be used for construction and that generators would not be required for welding at these sites.

Regenerable and Non-regenerable Treatment Facilities
Regenerable and/or non-regenerable treatment facilities are anticipated to be installed as part of the proposed project. These facilities are typically small, co-located with other water infrastructure and disturb less than 0.5 acres of land.

It is forecast that for site preparation for each treatment facility; no more than 0.5 acres would be actively graded on a given day. It is anticipated that grading activities will occur over a 5 day period and would require one bull dozer operating 8 hours per day, one water truck operating 4 hours per day and one dump truck operating 4 hours per day. Calculations assume five workers would each commute 40 miles round-trip to the work site.

Construction of each treatment facility would require the delivery and installation of equipment and materials. This phase of construction would result in a maximum of 6 truck trips per day with an average round trip of 20 miles delivering construction materials and equipment (concrete, steel, pipe, etc.) Installation of the treatment facility will require the use a crane, forklift, backhoe and front loader operating 4 hours per day. Calculations assume five workers would each commute 40 miles round-trip to the work site.

3.3.5 Operations

Operational air quality impacts would consist of vehicle trips to service the proposed facilities and energy required to power the proposed facilities. Operational impacts vary depending upon the type of infrastructure proposed. Most water related infrastructure, including wells, pump stations and pipelines, require very few vehicle trips for maintenance and operation, typically less than one trip per day per facility.

ASR Wells
ASR wells operate by gravity flow and require no pumping to place water in the aquifer. The combination of the minimum water pressure of 20psi required at the ground surface for fire flow and the weight of the water creates more than sufficient pressure with no additional pumping required.

There is no energy consumption for a monitoring well.

Booster Stations
Energy consumption for booster stations depends on the location within the basin to be pumped to and from and the volume of water to be pumped. An estimated average power requirement for booster stations is 380 kW per hour. Assuming a booster station runs 6 hours per day, the energy consumption would be 2300 kWhr per day. Total maximum daily electrical consumption is estimated to be 4.3 MW for each booster station.

Regenerable and Non-regenerable Treatment Facilities
The estimated power requirement for both regenerable and non-regenerable treatment facilities would be less than 100 kilowatts per hour (kWh) per facility, including groundwater pumping and facility operation energy requirements.

Periodic deliveries of salt (sodium chloride) to the regenerable facilities are required to maintain continuous operation. The solution would be delivered in bulk by chemical trucks. It is conservatively estimated that a maximum of one truck trip per day per facility would be required.

The frequency of resin change-out at the non-regenerable facilities could vary between 6 and 12 months, depending on contaminant concentration and use of the facility. When the resin from a non-regenerable facility is exhausted, it is either removed and regenerated off-site for use elsewhere, or disposed of in an appropriately licensed landfill, complete with leachate protection, etc. Ongoing maintenance and oversight of the facilities would conservatively require one visit by an agency employee to every above-ground facility (pipelines are excluded) each day. The total maximum daily electrical consumption is estimated to be 1.1 MW per day for each treatment unit.

Summary
In summary, the total maximum daily operational electrical consumption is estimated to be

- 1.1 MW per day for the regenerable and non-regenerable treatment units
- 4.3 MW for booster stations

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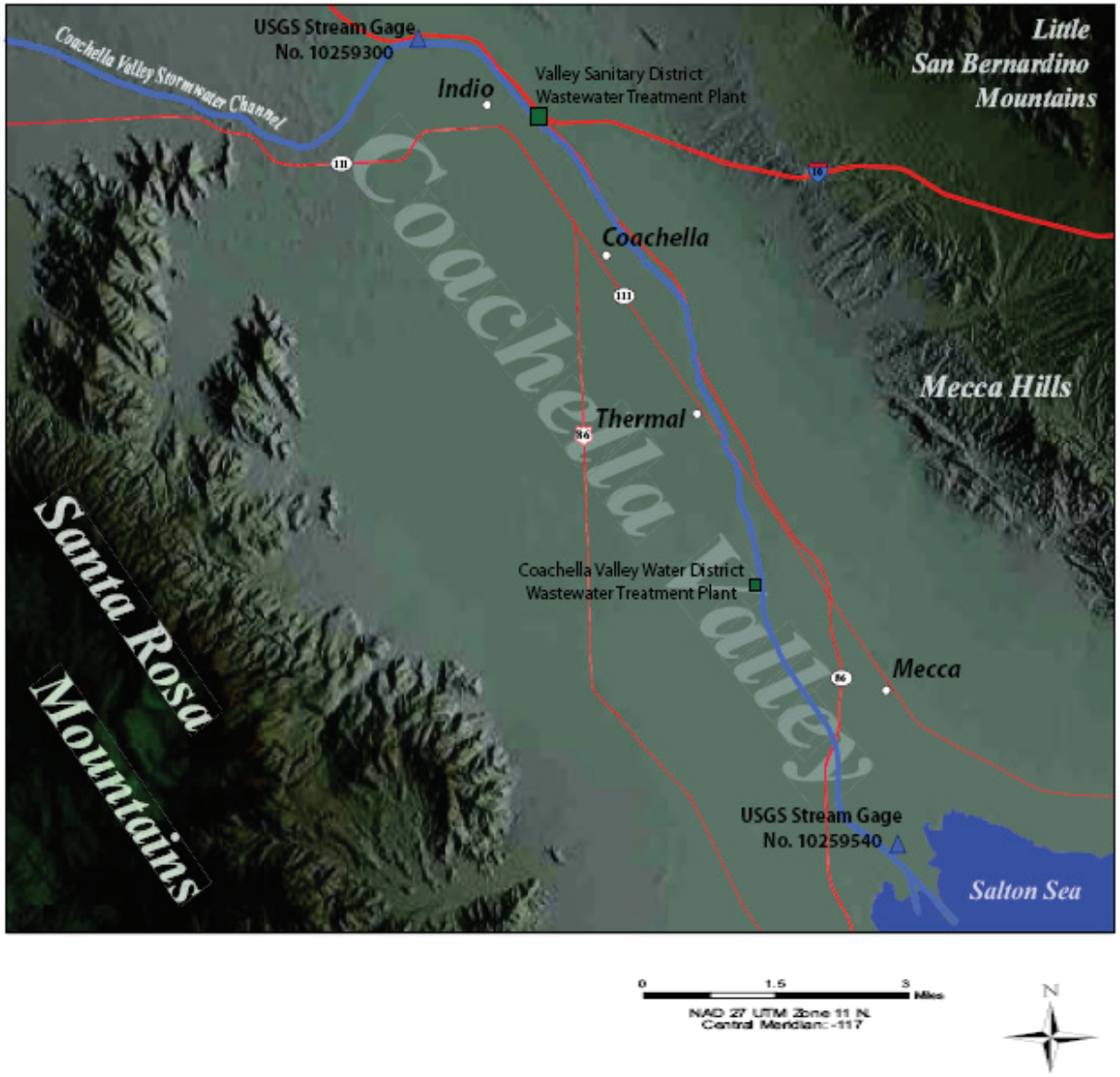
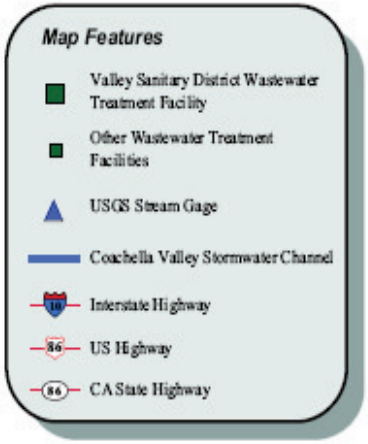
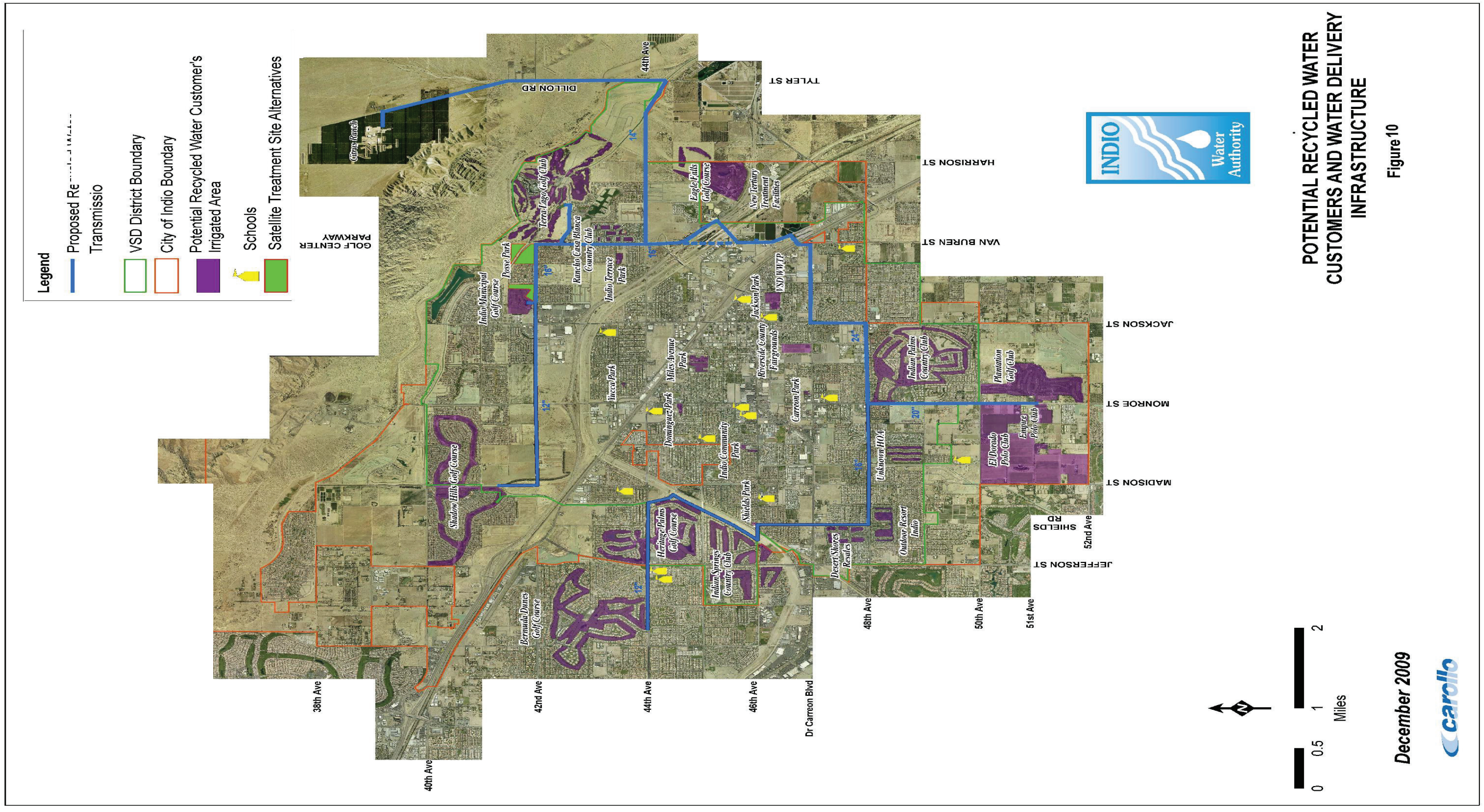
FIGURE 3-1
Regional Location





Source: Thomas Harder & Co. Groundwater Consulting

FIGURE 3-2
City Boundaries and VSD Facility Locations



Source: Carollo Engineers

FIGURE 3-3
Conceptual Site Layout of the Tertiary Filtration System

Source: Carollo Engineers

FIGURE 3-4
Preliminary Conceptual Site Layout of the Tertiary MF System

Source: Carollo Engineers

FIGURE 3-5
Conceptual Layout of the MBR System

Source: Carollo Engineers

FIGURE 3-6
Preliminary Conceptual Layout of the Groundwater Recharge Treatment Facility

Source: Carollo Engineers

CHAPTER 4 – ENVIRONMENTAL IMPACT EVALUATION

All Chapter 4 figures are located at the end of each subchapter; not immediately following their reference in text.

4.1 BACKGROUND

The Indio Water Authority (IWA or Authority) will serve as the Lead Agency under the California Environmental Quality Act (CEQA) and will coordinate the preparation of an Environmental Impact Report (EIR) that will evaluate the potential significant environmental impacts that may result from constructing and operating the "proposed project." IWA proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City of Indio and for possible groundwater recharge of the underlying aquifer. The proposed project EIR will evaluate the potential significant environmental impacts that may result from constructing and operating facilities associated with the proposed project, including (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand over an extended period of up to 10 years. Please refer to Figure 3-1 for a regional location map and Figure 3-2 for a map depicting the City of Indio boundaries and VSD facility locations.

Based on the findings of the Initial Study, the Authority concluded that a project EIR must be prepared to address the proposed installation and operation of the IWA Recycled Water Project. The decision to prepare an EIR is documented in the Initial Study and Notice of Preparation, which is provided in this document as Subchapter 8.1. The decision to prepare an EIR was based on the finding that the proposed project may have one or more significant effects on the environment in the project area, including to areas immediately adjacent to or to areas directly or indirectly impacted by the proposed infrastructure.

This chapter of the Draft Environmental Impact Report (DEIR) provides the detailed information used to forecast the type and significance of potential environmental impacts that implementation of the proposed project and related actions can cause if the project is implemented as described in Chapter 3, the Project Description.

In the following subchapters, each of the environmental topics identified in the Initial Study and further elaborated in Chapter 2 of this document as having a potential to cause significant environmental impact is evaluated. The environmental impact analysis section for each environmental topic is arranged in the following manner:

a. An introduction that summarizes the specific issues of concern for each subchapter, identified in the Initial Study and Notice of Preparation scoping process;

b. A summary of the current or existing environmental setting for each physical resource or human infrastructure system is presented as the baseline from which impacts will be forecast;

c. Based on stated assumptions, the potential direct and indirect impacts are forecast and the significance of impacts is assessed without applying any mitigation using identified criteria or thresholds of significance;

d. Recommended measures that can be implemented to substantially lessen potential environmental impacts are identified, and their effectiveness in reducing impacts to non-significant levels is evaluated;

e. Potential cumulative environmental impacts are assessed under each environmental topic, where applicable; and

f. Significant and unavoidable environmental impacts and any significant impacts that may be caused by implementing mitigation measures are addressed.

To provide the reviewer with a criterion or set of criteria with which to evaluate the significance of potential environmental impacts, this document provides issue specific criteria, i.e. thresholds of significance, for each topic considered in this DEIR. These criteria are either standard thresholds, established by law or policy (such as ambient air quality standards or thresholds of significance established by the South Coast Air Quality Management District) or project-specific evaluation thresholds that are developed with the IWA Staff and used specifically for this project. After comparing the forecasted physical changes in the environment that may be caused by implementing the proposed project with the issue specific significance threshold criterion or criteria, a conclusion is reached on whether the proposed project has the potential to cause a significant environmental impact for the issue being evaluated.

Where appropriate and feasible, measures to reduce potential significant environmental impacts are identified and described in this section of the DEIR. Over the past several years, mitigation has evolved in scope and complexity. As environmental issues are addressed in a progressive and adaptive manner, previous measures developed to mitigate project specific impacts are eventually integrated into local, regional, state and federal statutes, rules and regulations, such as the Uniform Building Code or Water Quality Management Plans. Mitigation measures that become statutes or rules and regulations become mandatory requirements (not discretionary) and they no longer need to be identified as additional mitigation applicable to the Project, although they are often referenced to demonstrate that identified environmental impacts are capable of being and will be mitigated.

The text in the following subchapters summarizes all of the various measures anticipated to be incorporated into the project to reduce potential significant environmental effects, either to the extent feasible or to a level of nonsignificance. After determining the degree of mitigation that can be achieved by the proposed measures and after identifying any potential adverse impacts that the mitigation measures can cause, a conclusion is provided regarding the remaining significant and/or unavoidable adverse impact for each environmental topic, if any.

This document utilizes conservative (worst case) assumptions in making impact forecasts based on the assumption that the impact forecasts should over-predict (if they cannot be absolutely quantified) consequences, rather than under-predict them. Several technical studies were prepared for this document and they are incorporated by summarizing the technical information in this document to ensure technical accuracy. These technical studies themselves are compiled in a separate volume of the DEIR (Volume 2) and copies of Volume 2 will be

distributed in electronic form and made available to all parties upon request. The information used and analyses performed to make impact forecasts are provided in depth in this document to allow reviewers to follow a chain of logic for each impact conclusion and to allow the reader to reach independent conclusions regarding the significance of the potential impacts described in the following subchapters.

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4.2 AIR QUALITY

4.2.1 Introduction

This section of the DEIR focuses on the assessment of potential air quality impacts on the environment that may result from the implementation of the IWA Recycled Water Project. The Initial Study evaluation determined that implementation of the project could cause adverse impacts on air quality. The most likely operational air quality impacts would be primarily from nitrogen oxides (NOx), due to electricity consumption for pumps and other facilities that consume electricity in support of moving recycled water within the project area. Substantial construction emissions may also be generated from installing pipelines, reservoirs, ASR wells, evaporation ponds or other supporting facilities. No substantive comments regarding potential air quality impacts of the project were received in the comments to the NOP. At the scoping meeting held on August 3, 2010 at 4 PM in the City of Indio Council Chambers located at 100 Civic Center Mall, Indio, CA 92201, a member of the Board asked whether the project would result in any smell associated with the process. Anders Wistrom, the Principal Water Engineer for the District at the time of the scoping meeting, responded that there would be no additional smells or odors coming out of the proposed project. No other comments were received at the scoping meeting regarding air quality and the proposed project.

4.2.2 Environmental Setting

An Air Quality Impact Analysis prepared by Giroux and Associates for the project is the basis for much of the information provided in this section. The Air Quality Technical Study is provided in Volume 2, Technical Appendices, to this document. The project is located entirely within the Coachella Valley Planning Area (CVPA) of the Salton Sea Air Basin (SSAB) which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The air quality regulatory jurisdictions within the project area include the U.S. Environmental Protection Agency (EPA), the California EPA, specifically the California Air Resources Board (CARB), and the SCAQMD.

The SCAQMD is responsible for regulating stationary source emissions in the project area and has the authority to regulate mobile emissions as an indirect source. At a minimum the proposed project will require permits from the SCAQMD for back-up generators required to provide power if or when electric power is not available.

4.2.2.1 Meteorology/Climate Setting

The climate of the Basin is characterized by hot summers, mild winters, infrequent rainfall, moderate afternoon breezes, and generally fair weather. Average daily minimum winter temperature is 40°F, and average daily maximum summer temperature is 108°F. Temperatures typically average 62°F year-round. Rainfall within the SSAB averages between 2 and 6 inches per year.

The prevailing winds within the region provide a vehicle for visible smog to be transported from the South Coast Air Basin through the mountain passes to the SSAB. The rapid daytime heating of the lower air leads to convective activity. This exchange of upper air tends to accelerate surface winds during the warm part of the day when convection is at a maximum.

During the winter, the rapid cooling of the surface layers at night retards this exchange of momentum which often results in calm winds.

The project area typically has poor air quality in the summer and good air quality in the winter due to the combination of onshore and offshore winds, surface inversions and moderate levels of air pollutant emissions generated within the air basin. The surface inversions result from the land surface cooling more quickly than the air at nighttime. The inversions are short-lived during the summer when the intense solar rays heat the land surface, but may persist until mid-morning in the winter. Nuisance air quality problems, such as odors from feedlots or wastewater plants or dust from mining operations, primarily occur during inversions.

4.2.2.2 Air Quality Setting

Ambient Air Quality Standards (AAQS)
Ambient air quality standards (AAQS) are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and safety. They are designed to protect those people most susceptible to respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research suggests, however, that long-term exposure to air pollution at levels that meet air quality standards may nevertheless have adverse health effects. For example, ozone exposure even at levels close to the ambient standard may lead to adverse respiratory health.

The federal Clean Air Act (CAA), the California Clean Air Act (CCAA), and the Air Quality Management Plan (AQMP), prepared and adopted by the SCAQMD, regulate air quality in the air basin. The following discussion describes the regulatory authority of the federal, state and local jurisdictions.

Federal Clean Air Act
The Federal CAA Amendments of 1990 required that the U.S. EPA review all national AAQS with respect to health impacts and propose modifications or new rules as appropriate. In addition, the amendments of the 1990 federal CAA are associated with the attainment and maintenance of air quality standards, permits and enforcement, toxic air pollutants, acid deposition, stratospheric ozone protection and motor vehicles and fuels.

The goal of Title I, the non-attainment provision, is to attain air quality standards for six criteria pollutants: ozone, oxides of nitrogen, oxides of sulfur, particulate matter (PM10), carbon monoxide, and lead. All non-attainment areas are designated or classified based on the severity of their non-attainment problem. These classifications determine the extent to which remedial actions must be taken within a given air quality planning area. The EPA has proposed strengthening the 8-hour ozone standard to a stricter level than the current State standard. Ozone and PM-10 standards are exceeded at times in the SSAB. On January 8, 2010, the SCAQMD adopted a re-designation request to remove the “serious non attainment” designation for PM-10 from the basin. The Coachella Valley PM-10 Maintenance Plan designed to maintain emissions levels below the federal PM-10 standard includes enhanced fugitive dust control measures, or best management practices, that are applicable to all construction projects in the Coachella Valley. A new federal one-hour standard for nitrogen dioxide (NO_2) has recently been adopted that is more stringent than the existing state standard. Based upon air quality

monitoring data in the South Coast Air Basin, the basin will likely be designated as "non-attainment" for the national one-hour standard. That designation will require the inclusion of NO_2 in the basin air quality management plan.

Federal and State ambient air quality standards are summarized in Table 4.2-1.

California Clean Air Act

The CCAA, passed by the California Legislature and signed into law by the Governor in 1988, is a comprehensive air pollution control agenda for the state of California. State standards are, in most cases, more stringent than federal standards. The goal of the CCAA is to attain state air quality standards by the earliest practical date. Because California established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology in much of California, there is a considerable difference between state and national clean air standards. Those standards currently in effect in California are shown on Table 4.2-1.

The CCAA requires each air pollution control district of an air basin designated as in non-attainment of state ambient air quality standards to prepare and submit a plan for attaining and maintaining state standards. After further review of the relationship between fine particulate matter and human health effects, the California Air Resources Board (CARB) adopted new state standards on June 20, 2002 for PM2.5 that are more stringent that the federal standards. This more stringent standard represents an air quality goal to dramatically reduce the adverse health effects from small-particle air pollution. Similarly, the CARB evaluated health effects of ozone exposure and adopted a new state standard for an 8-hour ozone exposure in 2005. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.075 ppm, but the state standard does not have a specific attainment deadline. Health effects from air pollutants are summarized in Table 4.2-2.

Each attainment plan must define the present and anticipated extent of non-attainment, including adopted and proposed measures to reduce emissions of the pollutant and/or its precursors, and their anticipated effectiveness; the availability and effectiveness of additional control measures; the earliest practicable attainment date; any legal, technological, or administrative impediment to developing and implementing an attainment plan; the relative significance of both natural and windblown emissions; and any additional information needed with respect to ambient air monitoring and air quality computer modeling, and estimated budgetary requirements to obtain the information.

Some of the CCAA requirements include reducing pollutants contributing to non-attainment by 5 percent per year, or 15 percent over a 3-year period, achieving an average commuter ridership of 1.3 persons per vehicle, reducing non-attainment pollutant exposures by 30 percent, and ranking control measures by implementation priorities.

Table 4.2-1
STATE OF CALIFORNIA AIR RESOURCES BOARD AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O3)	1 Hour	0.09 ppm (180 µg/m3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m3)		0.075 ppm (147 µg/m3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m3	Gravimetric or Beta Attenuation	150 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m3		–		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m3	Gravimetric or Beta Attenuation	15 µg/m3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m3)		35 ppm (40 mg/m3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m3)		–	–	–
Nitrogen Dioxide (NO2)	Annual Arithmetic Mean	0.030 ppm (56 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m3) (see footnote 8)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (338 µg/m3		100 ppb (188 µg/m3) (see footnote 8)		
Sulfur Dioxide (SO2)	24 Hour	0.04 ppm (105 µg/m3)	Ultraviolet Fluorescence	–	–	Spectrophotometry (Paraosaniline Method) [9]
	3 Hour	–		–	0.5 ppm (1300 µg/m3)	
	1 Hour	0.25 ppm (655 µg/m3)		75 ppm (196 µg/m3) (see footnote 9)	–	–
Lead [10]	30-Day Average	1.5 µg/m3	Atomic Absorption	–	–	–
	Calendar Quarter	–		1.5 µg/m3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[11]	–		0.15 µg/m3		

Pollutant	Average Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more (0.07 - 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24 Hour	25 µg/m3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m3)	Gas Chromatography			

Footnotes

1 California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter – PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2 National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.

8 To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

9 On June 2, 2010, the U.S. EPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO2 standard of 0.14 ppm and the annual primary SO2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of ppb. California standards are in units of ppm.

10 The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

11 National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: California Air Resources Board (09/08/10)

Table 4.2-2
HEALTH EFFECTS SUMMARY FOR AIR POLLUTANTS

Pollutants	Sources	Primary Effects
Ozone	Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	Aggravation of respiratory and cardiovascular diseases. Irrigation of eyes. Impairment of cardiopulmonary function. Plant leaf injury.
Nitrogen Dioxide	Motor vehicle exhaust. High temperature. Stationary combustion. Atmospheric reactions.	Aggravation of respiratory illness. Reduced visibility. Reduced plant growth. Formation of acid rain.
Carbon Monoxide	Incomplete combustion of fuels and other carbon-containing substances, such as motor vehicle exhaust. Natural events, such as decomposition of organic matter.	Reduced tolerance for exercise. Impairment of mental function. Impairment of fetal development. Death at high levels of exposure. Aggravation of some heart disease (angina).
Fine Particulate Matter (PM-10)	Stationary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	Reduced lung function. Aggravation of the effects of gaseous pollutants. Aggravation of respiratory and cardiorespiratory diseases. Increased cough and chest discomfort. Soiling. Reduced visibility.
Fine Particulate Matter (PM-2.5)	Fuel combustion in motor vehicles, equipment and industrial sources. Residential and agricultural burning. Industrial processes. Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides and organics.	Increases respiratory disease. Lung damage. Cancer and premature death. Reduces visibility and results in surface soiling.
Sulfur Dioxide	Combustion of sulfur-containing fossil fuels. Smelting of sulfur-bearing metal ores. Industrial processes.	Aggravation of respiratory diseases (asthma, emphysema). Reduced lung function. Irritation of eyes. Reduced visibility. Plant injury. Deterioration of metals, textiles, leather, finishes, coating, etc.
Lead	Contaminated soil.	Impairment of blood functions and nerve construction. Behavioral and hearing problems in children.

Source: California Air Resources Board, 2002.

There are no AAQS for non-criteria pollutants, such as diesel exhaust. The ARB identified diesel exhaust as a toxic air contaminant in 1998. Therefore, other guidelines are used to evaluate the potential air quality impact of diesel exhaust. For non-cancer effects, the California AB 2588 Air Toxics Hot Spots program criteria identify a hazard index. The hazard index (HI) is the ratio of a modeled concentration to a concentration (termed the reference exposure level) determined by the State of California Office of Environmental Health Hazard Assessment (OEHHA) below which no adverse health effects are expected to occur. The reference concentration for diesel exhaust is 5 ug/m^3. If the hazard index is less than 1.0, then health effects are not expected. For cancer effects, Proposition 65 established the criteria of no significant risk level of 10 incremental cancers per one million exposed persons (10 x 10-6).

Air Quality Planning

The CARB coordinates and oversees both State and federal air pollution control programs in California, and has divided the State into 15 air basins. Significant authority for air quality control within each basin has been given to the local Air Pollution Control Districts (APCD) or Air Quality Management Districts (AQMD) that regulate stationary source emissions and develop local non-attainment plans. The SCAQMD has jurisdiction over the air basin in which the proposed project is located, is responsible for regulating stationary source emissions, and has been given the authority to regulate mobile emissions as an indirect source.

Regional Air Quality

Monitoring of air quality in the project area is the responsibility of the SCAQMD. The closest monitoring stations to the various project sites are located at the Indio and Palm Springs air quality monitoring stations. In Indio, ozone and 10 micron diameter particulate matter (PM-10) are monitored. Carbon monoxide (CO) and nitrogen dioxide (NO_2) are monitored in Palm Springs. The air quality monitoring data from these stations are provided in Table 4.2-3. Pollutant concentrations within the Coachella Valley portion of the SSAB exceed the federal and State standards for ozone and particulate matter (PM-10 and PM-2.5). The violations of ozone standards are largely attributed to pollution blown into the SSAB from the South Coast Air Basin (SoCAB). The violations for particulate standards are attributed to both local and regional sources.

The SSAB air quality problems are caused by: unpaved road travel; construction activities; agricultural operations; meteorological conditions and topographical constraints that slow down dispersal of pollutants out of the basin and transport pollutants from the SoCAB into the SSAB; a low ability to disperse pollutants vertically in the atmosphere; and a sunny climate that provides the photochemical energy that increases creation of ozone and other pollutants. As stated above, the SSAB is in non-attainment for ozone and particulate matter, but primary pollutants such as carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide, sulfate, and lead do not exceed allowable levels, and the SSAB is in attainment for these criteria pollutants.

Table 4.2-3
AIR QUALITY MONITORING SUMMARY
(Days Standards Were Exceeded and Maximum Observed Concentrations)

Pollutant/Standard	2003	2004	2005	2006	2007	2008
Ozone[a]						
1-Hour > 0.09 ppm (S)	24	23	18	5	8	12
8-Hour > 0.07 ppm (S)	60	68	58	42	48	44
8- Hour > 0.075 ppm (F)	40	50	34	28	30	27
Max. 1-Hour Conc. (ppm)	0.12	0.11	0.11	0.10	0.11	0.12
Carbon Monoxide[b]						
1-Hour > 20. ppm (S)	0	0	0	0	0	0
8-Hour > 9. ppm (S, F)	0	0	0	0	0	0
Max 1-Hour Conc. (ppm)	3.3	2.1	2.1	2.3	1.5	1.3
Max 8-Hour Conc. (ppm)	2.2	2.0	2.0	1.9	1.9	1.8
Nitrogen Dioxide[b]						
1-Hour > 0.18 ppm (S)	0	0	0	0	0	0
Max 1-Hour Conc. (ppm)	0.07	0.07	0.06	0.09	0.06	0.05
Respirable Particulates (PM-10)[a]						
24-Hour > 50 $\mu g/m^3$ (S)	51/117	24/119	38/113	25/61	53/86	23/112
24-Hour > 150 $\mu g/m^3$ (F)	3/117	1/119	0/113	0/61	2/86	0/112
Max. 24-Hr. Conc. ($\mu g/m^3$)	158	74	122	NA	212	76
Ultra-Fine Particulates (PM-2.5)[a]						
24-Hour > 35 $\mu g/m^3$ (F)*	0/118	0/110	2/106	0/107	0/97	0/113
Max. 24-Hr. Conc. ($\mu g/m^3$)	27	29	44	26	27	22

Notes: [a] Data from Indio monitoring station #4157
[b] Data from Palm Springs air monitoring station #4137

(S) = state standard; (F) = federal standard

Source: SCAQMD Air Monitoring Station Data Summaries

4.2.3 Project Impacts

This section assesses potentially significant environmental impacts to air quality resulting from implementing the IWA Recycled Water Project. Section 4.2.3.1 sets forth the threshold criteria used to determine the significance of air quality impacts under State CEQA Guidelines, as well as under regional SCAQMD policies.

4.2.3.1 Significance Criteria

Appendix G of the California CEQA Guidelines offers the tests of air quality impact significance that are included in the standard Initial Study checklist. Air quality impacts are considered significant if they cause clean air standards to be violated where they are currently met, or if they will measurably contribute to an existing violation of standards. Any substantial emissions

of air contaminants for which there is no safe exposure, or nuisance emissions such as dust or odors, may also be considered a significant impact.

Appendix G of the California CEQA Guidelines offers the following five tests of air quality impact significance. A project would have a potentially significant impact on air quality if it:

a. Conflicts with or obstructs implementation of the applicable air quality plan,

b. Violates any air quality standard or contributes substantially to an existing or projected air quality violation,

c. Results in a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors),

d. Exposes sensitive receptors to substantial pollutant concentrations, and

e. Has a substantial, demonstrable negative aesthetic effect.

Further, Appendix I of the California CEQA guidelines states that a project could have a significant impact on air quality if it:

- Creates objectionable odors affecting a substantial number of people, and
- Alters air movement, moisture, or temperature, or causes a change in climate, either locally or regionally.

The SCAQMD identifies specific quantitative emission thresholds that are recommended to local agencies for determining significance of air emissions from a specific project. These thresholds are listed in Table 4.2-4.

Table 4.2-4
SCAQMD EMISSIONS THRESHOLDS

Pollutant	Threshold (lb/day)
Carbon Monoxide (CO)	550
Sulfur Oxides (SO2)	150
Reactive Organic Compounds (ROC)	75
Nitrogen Oxide (NOx)	100
Particulate Matter (PM-10)	150
Particulate Matter (PM-2.5)	55
Lead	3

Section 176(c) of the Clean Air Act Amendments of 1990 prohibits federal participation in projects that would impede implementation of the state implementation plan (SIP) for federal non-attainment pollutants. If the project-related emissions from construction and operations are

less than specified "*de minimis*" levels, no further SIP consistency demonstration is required. Although the project is located within the SSAB, the SSAB air quality is dependent upon the SoCAB. SoCAB is designated as an "extreme" non-attainment area for the federal 8-hour ozone standard. Based upon this designation, the following emissions levels identified in Table 4.2-5 are presumed evidence of SIP conformity:

Table 4.2-5
FEDERAL SIGNIFICANCE THRESHOLDS

Pollutant	Threshold (tons/year)
Nitrogen Oxide (NOx)	10
Reactive Organic Compounds (ROC)	10
Particulate Matter	70

Projects with annual direct and indirect emissions below these thresholds are considered to be in conformance with the applicable SIP.

4.2.3.2 Project Impact Analysis

Potential short-term air quality impacts attributable to the project are generally due to grading and construction, including onsite generation of fugitive dust, equipment exhaust, off-gasing of paving materials, and offsite emissions from construction employee commuting and/or trucks delivering building materials. Potential long-term air quality impacts are generally due to increased electrical consumption from equipment that provides water treatment and supply. The project involves the following project components:

(1) Installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water.

(2) Installation and/or conversion and operation of approximately 22 linear-miles pipelines for recycled water conveyance.

(3) Installation and operation of one or more groundwater recharge treatment facilities.

(4) Installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

(5) Install booster pumping facilities to pressurize their irrigation systems in order to use recycled water for HOAs, golf courses and City parks.

Emissions from these activities were calculated in an air quality technical report prepared by Giroux & Associates, which is provided as Appendix 1 in Volume 2, Technical Appendices, to this DEIR. Much of this information is brought forward in the following analysis to allow the reviewer to ascertain how the project emissions were forecast. The infrastructure required to dispose of the Reverse Osmosis (RO) brine waste that would result from the recycled water treated for groundwater recharge via ASR wells has not been evaluated in entirety. While any

pipelines or booster stations necessary for conveyance of brine waste to agriculture fields or evaporation ponds would be evaluated in the same manner as other pipelines and booster stations herein, the impacts associated with constructing and operating agriculture fields that drain to lined evaporations ponds has not been evaluated. A subsequent environmental review will be required to evaluate the complete impacts of the proposed RO treatment process.

- **Would the proposed project interfere with the attainment of the federal or state ambient air quality standards by either violating or contributing to an existing or projected air quality violation? Would it conflict with or obstruct implementation of the applicable air quality plan?**

Short-term Construction Emissions

Construction activities for the proposed upgrade and expansion project are anticipated to occur over an approximately 1-year period with the exception of pipeline installation which would occur over nine years. Since SIP compliance is based on construction emissions from a single year, the phasing assumption of non-pipeline activities represents a worst-case construction scenario. If the project construction and development schedule were spread out over multiple years, annual emissions would be lower. On-site construction equipment emissions were calculated utilizing the URBEMIS2007 computer model. Employee commuting emissions as well as material delivery trucks emissions were calculated for each construction activity utilizing EMFAC2007.

Construction activities include: excavation, mass grading, fine grading, pipeline installation, removal and replacement of road and parking areas for pipeline installation, installation of electrical lines and other required support infrastructure, construction of foundations, construction and installation of above-ground facilities and equipment, and assembly and installation of treatment facilities. Heavy equipment is used to excavate, grade, and level. Trucks are used to haul away excavation material and to bring construction equipment and materials to the site. Equipment activity levels vary considerably throughout the construction of a project as well as on any given day. However, based on the construction scenario identified in Chapter 3, Project Description, the following air emission forecast has been compiled. Please refer to Volume 2, Technical Appendices for full details.

Pipeline Phase

It is anticipated that installation of pipeline in developed locations would require the use of a backhoe, crane, compactor, roller/vibrator, pavement cutter, grinder, haul truck and two dump trucks operating 6 hours per day; a water truck and excavator operating 4 hours per day and a paving machine and compacter operating 2 hours per day. Installation of pipeline in undeveloped locations would require the same equipment without the paving equipment (cutter, grinder, paving machine). Typically, up to 900 feet of pipeline trench could be excavated, the pipe installed, backfilled, and compacted each day during pipeline installation in undeveloped areas whereas only 300 ft per day can be installed in developed roadways. The pipelines that would be installed in support of the IWA Recycled Water Project would use push-on joints (e.g., gasketed bell-and-spigot) that do not require welding. However, the Contractor may occasionally use a portable generator and welder for equipment repairs or incidental uses.

Emissions from pipeline installation would occur from fugitive dust, equipment exhaust, worker trips, pavement off-gas and carbon dioxide emissions due to the manufacture of steel. Criteria pollutant emissions from pipeline construction activities are summarized in Table 4.2-6.

Table 4.2-6
PIPELINE CONSTRUCTION ACTIVITY EMISSIONS (pounds/day)

	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
No Mitigation	4.1	34.6	16.4	0.0	6.6	2.5	4092.4
With Mitigation	4.1	29.5	16.4	0.0	1.6	0.5	4092.4
SCAQMD Threshold	75	100	550	150	150	55	N/A

Source: URBEMIS2007 Model, Output in Appendix

Materials delivery would require approximately one truck per day for unimproved areas and one truck every three days for improved alignment installation. Pipeline construction would require up to two truck trips per day with an estimated average round trip of 40 miles delivering construction materials and equipment (concrete, steel, pipe, etc.) Calculations assume twelve workers would each commute 40 miles round-trip to the work site, and that only one work crew would install pipeline at a time. The on-road emissions from construction crew commuting and truck deliveries related to pipeline installation activities are summarized in Table 4.2-7.

Table 4.2-7
PIPELINE 2012 ON-ROAD EMISSIONS FROM TRUCK DELIVERIES AND CREW COMMUTING (pounds/day)

	Miles/day	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Car and Light Truck	480	0.4	0.4	3.7	0.0	0.0	528.7
Delivery -1 truck/day max	40	0.1	1.2	0.4	0.1	0.1	168.6

The combined total worst-case emissions from unmitigated construction emissions and employee commuting associated with pipeline installation are summarized in Table 4.2.8.

Table 4.2-8
COMBINED EMISSIONS FROM WATER PIPELINE INSTALLATION, TRUCK DELIVERIES AND EMPLOYEE COMMUTING (pounds/day)

	ROG	NOx	CO	PM-10	PM-2.5	CO_2
TOTAL	4.6	36.2	20.5	6.7	2.6	4789.7
SCAQMD Threshold	75	100	550	150	55	N/A

ASR Wells Phase
Development of up to four new ASR wells in a single year would require the delivery and set up of the drilling rig as described within Chapter 3, Project Description. It is anticipated these wells would be drilled at the same time and the drilling equipment would be transported to and from each site on one occasion.

The drilling and development of each well to a depth of up to 850 feet would take approximately 45 days, of which 15 to 20 days would include 24-hour drill activity. Typically, well drilling requires only minimal earth movement and/or grading. The well casings are expected to be

welded and it is assumed that well development and installation would require two weeks of diesel generator support.

Criteria pollutant emissions from ASR well development activities are summarized in Table 4.2-9.

Table 4.2-9
ASR WELL DEVELOPMENT ACTIVITY EMISSIONS (pounds/day)

	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
No Mitigation	1.7	15.8	6.9	0.0	3.2	1.1	1982.1
With Mitigation	1.7	13.4	6.9	0.0	0.8	0.2	1982.1
SCAQMD Threshold	75	100	550	150	150	55	N/A

Source: URBEMIS2007 Model, Output in Appendix

A construction crew of 2 persons would develop each well. A round trip commute distance of 40 miles per employee was assumed. Delivery of the drilling equipment, well casings, pumps, motors, etc. for each well is forecast to require about 1,050 truck miles. The on-road emissions from construction crew commuting and truck deliveries related to ASR well development activities are summarized in Table 4.2-10.

Table 4.2-10
ASR WELL DEVELOPMENT ON-ROAD EMISSIONS FROM TRUCK DELIVERIES AND CREW COMMUTING (pounds/day)

	Miles/day	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Car and Light Truck	80	0.1	0.1	0.6	0.0	0.0	88.1
Delivery -1,050 miles total	23	0.1	0.7	0.2	0.0	0.0	97.0

The combined total worst case emissions from unmitigated construction emissions and employee commuting associated with ASR well development are summarized in Table 4.2-11.

Table 4.2-11
ASR WELL DEVELOPMENT AND EMPLOYEE COMMUTING (pounds/day)

	ROG	NOx	CO	PM-10	PM-2.5	CO_2
TOTAL	1.9	16.6	7.7	3.2	1.1	2167.2
SCAQMD Threshold	75	100	550	150	55	N/A

Booster Station Phase
Pump or booster stations may be constructed as part of the Recycled Water Project. As identified within Chapter 3, Project Description, site preparation would require minimal grading followed by construction of a foundation and construction of an exterior structure (typically brick to attenuate sound.) The pump would then be lifted into the structure through the open roof by a small crane and finally the roof would be installed. Emissions from booster station

construction occur from fugitive dust due to mass grading activities, equipment exhaust, worker trips, cement and steel manufacturing, and architectural coating activities.

It is forecast that no more than 0.5 acres would be actively graded on a given day for site preparation of each booster station. It is anticipated that grading activities would occur over a 5-day period and would require one bull dozer or motor grader operating 8 hours per day, one water truck operating 4 hours per day and one dump truck operating 4 hours per day. Installation of the booster station would require the use a crane, forklift, backhoe and front loader operating 4 hours per day. It is expected that pump stations installed as part of the project would be located at sites with permanent power available that would be used for construction and that generators would not be required for welding at these sites. Criteria pollutant emissions from booster station construction activities are summarized in Table 4.2-12.

Table 4.2-12
BOOSTER STATION CONSTRUCTION ACTIVITY EMISSIONS (pounds/day)

	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
No Mitigation	2.3	20.9	8.9	0.0	3.3	1.2	2233.8
With Mitigation	2.3	17.8	8.9	0.0	0.8	0.3	2233.8
SCAQMD Threshold	75	100	550	150	150	55	N/A

Source: URBEMIS2007 Model, Output in Appendix

Construction of each pump station would require the delivery and installation of equipment and materials. This phase of construction would result in a maximum of 6 truck trips per day with an average round trip of 20 miles delivering construction materials and equipment (concrete, steel, pipe, etc.). Calculations assume five workers would each commute 40 miles round-trip to the work site. The on-road emissions from construction crew commuting and truck deliveries related to booster station construction activities are summarized in Table 4.2-13.

Table 4.2-13
BOOSTER STATION 2012 ON-ROAD EMISSIONS FROM CREW COMMUTING AND TRUCK DELIVERIES (pounds/day)

Activity	Miles/day	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Booster Station Grading - Car and Light Truck	200	0.2	0.2	1.5	0.0	0.0	220.3
Booster Station Construction – Car and Light Truck	200	0.2	0.2	1.5	0.0	0.0	220.3
Booster Station Construction - delivery	120	0.3	2.9	1.5	0.0	0.0	419.0

The combined total worst case emissions from unmitigated construction emissions and employee commuting associated with booster station construction are summarized in Table 4.2-14.

Table 4.2-14
BOOSTER STATION CONSTRUCTION AND EMPLOYEE COMMUTING (pounds/day)

Activity	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Grading TOTAL	2.5	21.1	10.4	3.3	1.2	2454.1
Construction TOTAL	1.6	12.4	9.9	0.5	0.5	2083.7
SCAQMD Threshold	75	100	550	150	55	N/A

Reservoir Phase
There are no plans to construct any reservoirs as part of the project at this time; however, impacts associated with reservoir construction are included in the event that future circumstances require the construction of reservoirs to support the IWA Recycled Water Project.

It is forecast that for site preparation of a reservoir and access road, no more than 2 acres would be actively graded on a given day. It is anticipated that grading activities would occur over a 10-15 day period and would require one bull dozer, front end loader, water truck, grader, excavator and two dump/haul trucks operating 6 hours per day. Installation of a reservoir would occur over about 30 days and would require the use a crane, forklift, backhoe, front loader and two haul trucks operating 6 hours per day.

Typically, the exteriors of reservoirs are coated with a primer and enamel coats both to prevent corrosion and for aesthetic purposes. South Coast Air Quality Management District Rule 1113, as amended, sets limits on the volatile reactive organic compounds (VOC or ROC) that can be released by coatings sold within the District. Impact estimates assume that the largest reservoir that would be constructed as part of the proposed project would be a 5 million gallon tank and that it would be coated to a 6 mil thickness.

Criteria pollutant emissions from reservoir construction activities are summarized in Table 4.2-15.

Table 4.2-15
RESERVOIR CONSTRUCTION ACTIVITY EMISSIONS (pounds/day)

	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
No Mitigation	4.6	39.3	19.5	0.0	4.3	2.1	4344.9
With Mitigation	4.6	33.4	19.5	0.0	0.9	0.4	4344.9
SCAQMD Threshold	75	100	550	150	150	55	N/A

Source: URBEMIS2007 Model, Output in Appendix

Construction of a reservoir would require the delivery and installation of equipment and materials. This phase of construction would result in an approximate maximum of 6 truck trips per day with an average round trip of 20 miles delivering construction materials and equipment (concrete, steel, pipe, etc.). Calculations assume eight workers would each commute 40 miles round-trip to the work site for grading and six workers would each commute 40 miles round-trip to the work site for construction. Emissions from employee commuting and truck deliveries associated with reservoir construction are summarized in Table 4.2-16.

Table 4.2-16
RESERVOIR 2012 ON-ROAD EMISSIONS FROM CREW COMMUTING AND TRUCK DELIVERIES (pounds/day)

Activity	Miles/day	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Reservoir Grading - Car and Light Truck	320	0.3	0.2	2.4	0.0	0.0	352.5
Reservoir Construction – Car and Light Truck	240	0.2	0.2	1.8	0.0	0.0	264.4
Reservoir Construction – delivery	120	0.3	2.9	1.5	0.0	0.0	419.0

The combined total worst case emissions from unmitigated construction emissions and employee commuting associated with reservoir construction are summarized in Table 4.2-17.

Table 4.2-17
RESERVOIR CONSTRUCTION AND EMPLOYEE COMMUTING (pounds/day)

Activity	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Grading TOTAL	4.8	41.2	19.7	6.7	2.1	4697.4
Construction TOTAL	2.0	15.4	12.3	0.7	0.6	2460.3
SCAQMD Threshold	75	100	550	150	55	N/A

Regenerable and/or Non-regenerable Treatment Facilities Phase
Regenerable and/or non-regenerable treatment facilities are typically small, co-located with other water infrastructure and disturb less than 0.5 acres of land. It is forecast that site preparation for each treatment facility would require no more than 0.5 acres be actively graded on a given day. It is anticipated that grading activities will occur over a 5 day period and would require one bull dozer operating 8 hours per day, one water truck operating 4 hours per day and one dump truck operating 4 hours per day. Installation of the treatment facility would require the use a crane, forklift, backhoe and front loader operating 4 hours per day.

Criteria pollutant emissions from regenerable and/or non-regenerable treatment facilities construction activities are summarized in Table 4.2-18.

Table 4.2-18
REGENERABLE AND/OR NON-REGENERABLE TREATMENT FACILITIES CONSTRUCTION ACTIVITY EMISSIONS (pounds/day)

	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
No Mitigation	1.7	15.5	7.5	0.0	1.8	0.8	1630.6
With Mitigation	1.7	13.2	7.5	0.0	0.4	0.2	1630.6
SCAQMD Threshold	75	100	550	150	150	55	N/A

Source: URBEMIS2007 Model, Output in Appendix

Construction of each treatment facility would require the delivery and installation of equipment and materials. This phase of construction would result in a maximum of 6 truck trips per day with an average round trip of 20 miles delivering construction materials and equipment (concrete, steel, pipe, etc.) Calculations assume five workers would each commute 40 miles round-trip to the work site for grading and construction activities.

Emissions from employee commuting and truck deliveries associated with regenerable and/or non-regenerable treatment facilities construction are summarized in Table 4.2-19.

Table 4.2-19
REGENERABLE AND/OR NON-REGENERABLE TREATMENT FACILITIES
2012 ON-ROAD EMISSIONS FROM CREW COMMUTING
AND TRUCK DELIVERIES (pounds/day)

Activity	Miles/day	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Regen Grading - Car and Light Truck	200	0.2	0.2	1.5	0.0	0.0	220.3
Regen Construction – Car and Light Truck	200	0.2	0.2	1.5	0.0	0.0	220.3
Regen Construction – delivery	120	0.3	2.9	1.5	0.0	0.0	419.0

The combined total worst case emissions from unmitigated construction emissions and employee commuting associated with regenerable and/or non-regenerable treatment facilities construction are summarized in Table 4.2-20.

Table 4.2-20
REGENERABLE AND/OR NON-REGENERABLE TREATMENT FACILITIES
CONSTRUCTION AND EMPLOYEE COMMUTING (pounds/day)

Activity	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Grading TOTAL	1.9	15.7	9.0	1.8	0.8	1850.9
Construction TOTAL	1.6	11.6	9.7	0.5	0.5	2007.8
SCAQMD Thresholds	75	100	550	150	55	N/A

Construction Summary

The regional air quality impacts associated with construction equipment activity during project activities are shown to be less-than-significant for every air pollutant while activities occur in discrete phases. However, a worst case scenario was assumed to be where each construction activity for all infrastructure occurs simultaneously in a single year, except for pipeline development would occur over a nine year period. Table 4.2-21 summarizes the cumulative worst case day emissions that would occur if all project elements were under construction at the same time.

Table 4.2-21
MAXIMA DAILY CONSTRUCTION EMISSIONS (lbs/day)

	ROG	NOx	CO	PM-10	PM-2.5	CO_2
ARS Wells	1.9	16.6	7.7	3.2	1.1	2,167.2
Pipelines	4.6	36.2	20.5	6.7	2.6	4,789.7
Reservoir	2.0	15.4	12.3	0.7	0.6	2,460.3
Booster Station	1.6	12.4	9.9	0.5	0.5	2,083.7
Regenerable or Non-regenerable Facilities	1.6	11.6	9.7	0.5	0.5	2,007.8
Total	11.7	92.2	50.4	11.6	5.3	13,508.70
SCAQMD Thresholds	75	100	550	150	55	-

Unmitigated, peak daily emissions for all construction activities, even if simultaneous, would be below the applicable SCAQMD CEQA threshold. Application of recommended mitigation provided below will reduce emissions even further. The dispersed geography of the proposed construction activities would likely prevent any localized violation of the NOx or other standards.

Annualized construction activity emissions were calculated by assuming peak daily activities would occur for the indicated time frame. The calculated emissions were then compared to the EPA *de minimis* emission thresholds that would allow for a federal conformity finding with Section 176c of the Clean Air Act. Table 4.2-22 summarizes the assumed annual distribution of project construction activity and associated unmitigated annual emissions.

Table 4.2-22
ANNUAL CONSTRUCTION-RELATED AIR POLLUTION EMISSIONS (tons/year)

Activity	*Days*	*ROG*	*NOx*	*CO*	*PM-10*	*PM-2.5*	*CO_2*
ARS Wells (4 per year)	45	0.17	1.49	0.69	0.29	0.10	195.05
Pipeline	40	0.09	0.72	0.41	0.13	0.05	95.79
Reservoir Grading	10	0.04	0.31	0.15	0.05	0.02	35.23
Reservoir Construction	30	0.03	0.23	0.18	0.01	0.01	36.90
Booster Grading	5	0.01	0.05	0.03	0.01	0.00	6.14
Booster Construction	90	0.07	0.56	0.45	0.02	0.02	93.77
Regenerable (or Non) Facility Grading	5	0.00	0.04	0.02	0.00	0.00	4.63
Regenerable (or Non) Facility Construction	30	0.02	0.17	0.15	0.01	0.01	30.12
Total	**-**	0.44	3.58	2.07	0.53	0.21	497.62
De Minimis	-	10	10	n/a	70	100	-

Emissions from project construction activities would be well below the EPA *de minimis* thresholds; therefore, the proposed project construction activities are in conformance with the SIP and a formal SIP consistency analysis is not required.

Long-Term Operation Emissions

The proposed IWA Recycled Water Project would require increased electrical consumption to process wastewater to meet recyclable standards. Because electrical power is derived from the regional grid, there is no direct correlation between consumption and the location of where power-generating emissions would be released. Electricity is generated by a combination of fossil fuel combustion and renewable resources (hydro, wind, etc.). There is therefore some unquantified air pollution impact from increased electrical demand, but that impact is regionally cumulative.

The proposed IWA Recycled Water Project would also result in minor amounts of exhaust pollution from the delivery of treatment chemicals, filtration media and disposal of wastes and from employee commutes. Operational mobile source emissions attributable to the project-related employment were calculated assuming five new employees would be hired to operate the project components and that each would commute 20 miles round trip, five days a week. Mobile source emissions from an estimated annual vehicle mile traveled (VMT) generation of 26,000 miles were calculated for the year 2012 as provided in Table 4.2-23.

Table 4.2-23
OPERATIONS EMPLOYEE COMMUTING ATTRIBUTED TO THE PROJECT (tons/year)

ROG	*NOx*	*CO*	*SO_2*	*PM-10*	*PM-2.5*
0.03	0.40	0.13	<0.01	0.02	0.01

Annual project-related construction and operational air pollution emissions relative to federal standard attainment designations and appropriate *de minimis* thresholds are provided in Table 4.2-24.

Table 4.2-24
ANNUAL CONSTRUCTION AND OPERATIONS EMISSIONS RELATIVE TO FEDERAL ATTAINMENT STATUS

Pollutant	Status* (Attainment, Non-Attainment or Unclassified)	Threshold of Significance for the Area	Construction Emissions (Tons/year)	Operation Emissions (Tons/year)
Ozone (1-hour)	n/a	-	-	-
Ozone (8-hour)	Extreme	10 (ROG) 10 (NOx)	0.44	0.03
PM-10	Serious	70	0.53	0.02
PM-2.5	Non-Attainment	100	0.21	0.01
CO	Attainment	100	2.07	0.13
NO_2	Attainment**	10 (NOx)	3.58	0.40
SO_2	Attainment	100	<0.01	<0.01

*Federal Standards
**May be redesignated non-attainment for the recently adopted 1-hour federal NO_2 standard

Construction and operational emissions do not exceed the *de minimis* thresholds established in 40 CFR 93.153.

Local Significance Thresholds

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance. These analysis elements are called Local Significance Thresholds (LSTs). LSTs were developed in response to Governing Board's Environmental Justice Enhancement Initiative 1-4 and the LST methodology was adopted 2005.

Use of an LST analysis for a project is optional because they were derived for economically or socially disadvantaged communities. For this project, LSTs are only applicable to construction activities. LSTs are only applicable to the following criteria pollutants: oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM-10 and PM-2.5). LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

Project activity occurring on the Valley Sanitation District site is not adjacent to any sensitive receptor. The proposed pump stations and treatment facilities on Avenue 42 were the only project components that were found to potentially affect adjacent sensitive uses.

LST pollutant concentration data is currently only published for 1, 2 and 5 acre sites for varying receptor distances. The local disturbance area for the proposed treatment plant and pump stations is approximately 2 acres. The closest residential receptors are approximately 50 feet from the nearest site boundary. Pollutant concentrations for a 2-acre disturbance area and for the minimal source-receptor distance of 25 meters are provided in Table 4.2-25.

Table 4.2-25
LOCAL SIGNIFICANCE THRESHOLDS AND POLLUTANT CONCENTRATIONS AT ADJACENT SENSTIVE RECEPTORS (pounds per day)

Coachella Valley	CO	NOx	PM-10	PM-2.5
Local Significance Threshold	1,229	191	7	2
Proposed Project				
Site Preparation	10	21	3	1
Construction	10	12	1	1

All emissions are below LST thresholds for construction with or without the application of mitigation measures.

Toxic Air Contaminants (TACs)

Construction equipment exhaust contains carcinogenic compounds within the diesel exhaust particulates. The toxicity of diesel exhaust is evaluated relative to a 24-hour per day, 365 days per year, 70-year lifetime exposure. Public exposure to heavy equipment operating in the distance for limited periods of time would be an extremely small fraction of the above dosage assumption. The sensitive receptors along the project alignment would be exposed to a much greater amount of diesel particulates over a much longer period of time by routine roadway operations. Based on the short-term of potential diesel exhaust emissions at any given location

for the project components outlined above, future construction-related heavy equipment operations exhaust would not pose a significant public health risk.

During project operations, the only sources of emissions are worker commutes and electrical consumption. Electricity consumption does not result in localized toxic emissions from any sources within the SSAB, and worker commutes, typically in non-diesel vehicles, pose less of a health risk than the construction equipment exhaust, which was already found to have no significant impact. Therefore, no significant TAC emissions are forecast to occur from project implementation, and no adverse long-term public health impacts are forecast to result from such emissions.

Summary

In summary, with or without the use of mitigation measures to control air pollutant emission, peak daily construction activity emissions for the proposed project would be below CEQA SCAQMD thresholds. However, the non-attainment status of the SSAB requires that best management practices be employed to minimize dust and equipment exhaust emissions. Construction emissions of air contaminants would be temporary and cease when each project is fully constructed. Mitigation measures to reduce temporary impacts of construction are included in Section 4.2.4 below.

- **Would the proposed project result in a cumulatively considerable net increase in any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

As discussed in the previous section, the SSAB exceeds ambient air quality standards for ozone, PM-10 and PM-2.5. The SSAB air quality problems are caused by: unpaved road travel; construction activities; agricultural operations; meteorological conditions and topographical constraints that slow down dispersal of pollutants out of the basin and transport pollutants from the SCAB into the SSAB; a low ability to disperse pollutants vertically in the atmosphere; and a sunny climate that provides the photochemical energy that increases creation of ozone and other pollutants. Primary pollutants such as carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide, sulfate, and lead do not exceed allowable levels and the SSAB is in attainment for these criteria pollutants.

As detailed above in Tables 4.2-6 through 4.2-20, emissions associated with construction of the individual project components fall below the SCAQMD CEQA significance thresholds for all criteria pollutants, with or without the use of mitigation. Tables 4.2-21 and 4.2-22 demonstrate that even if all construction activities were to occur simultaneously, construction emissions would fall below the SCAQMD CEQA significance thresholds for all criteria pollutants, with or without the use of mitigation.

As a worst case, Table 4.2-24 summarized combined total worst case unmitigated emissions from construction emissions and employee commuting, assuming that all projects are under simultaneous construction. Emissions would fall below the appropriate federal “de minimis” thresholds, thereby demonstrating conformance with the SIP, even with all projects overlapping in time, with the majority of construction occurring in a single year (pipeline construction would still occur over multiple years) and all construction beginning at the same time.

Because of the non-attainment status of the air basin, best management practices for control of air pollutant emissions are required to be employed to minimize dust and equipment exhaust

emissions. Mitigation measures are identified below to reduce emissions to the lowest achievable levels.

Regarding operations, operational impacts would result from increased regional electrical consumption and increased vehicle trips. As previously stated, these impacts are forecast to result in negligible air quality impacts and are not projected to exceed the regional significance thresholds.

- **Would the proposed project expose sensitive receptors to substantial pollutant concentrations?**

There are "sensitive receptors," including residences, schools, and recreational facilities that are located within 1/4 mile of the proposed IWA Recycled Water Project facilities. The only predictable short-term toxic emissions associated with the proposed project would be those associated with diesel fuel consumed by construction equipment. Long-term emissions would include those associated with electricity consumption, and vehicle trips associated with material transportation and worker trips. As discussed above, TAC emissions for the proposed project are considered less than significant during both construction and operational activities associated with the Project.

- **Would the proposed project generate vehicle trips that cause a CO hot spot?**

The proposed project does not include generation of substantial traffic in conjunction with any of the proposed IWA Recycled Water Project facilities. The SSAB is classified as an attainment area for CO. In addition, the local air quality monitoring station in Palm Springs indicates that CO thresholds were not exceeded in the previous six years for which data was available. If the more urbanized Palm Springs monitoring station has not recorded violations of CO, there would not be violations expected in the project area.

The SCAQMD has demonstrated in the CO attainment redesignation request to EPA that there are no "hot spots" anywhere in Southern California, even at intersections with much higher volumes, much worse congestion, and much higher background CO levels than anywhere in the project area. If the worst-case intersections in the SoCAB have no "hot spot" potential, any local impacts near the project site in the SSAB will be well below thresholds with an even larger margin of safety.

- **Would the proposed project alter air movement, moisture, or temperature, or cause a change in climate, either locally or regionally?**

In response to the requirements of SB97, the state Resources Agency developed guidelines for the treatment of GHG emissions under CEQA in March, 2010. Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to "select the model or methodology it considers most appropriate". The most common practice for infrastructure/combustion GHG emissions quantification is to use a computer model such as URBEMIS2007, as was used in the following analysis.

The SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold for industrial projects of 10,000 metric tons of CO_2-equivalent annual emissions. As of the time of this writing, April 2011, no final action on a quantitative significance threshold has been

taken. Wastewater reclamation is not strictly an "industrial" process; however, IWA concludes that this is an appropriate screening level for use in the following analysis.

GHG Impact Analysis
GHG emissions would be potentially significant if the project would:

- Generate greenhouse gas emissions either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

During project construction, the URBEMIS2007 computer model predicts that the grading and construction activities will generate 498 "short" tons or 453 "metric" tons of CO_2 emissions. Equipment exhaust also contains small amounts of methane and nitric oxides which are also GHGs. Non-CO_2 GHG emissions represent approximately a one percent increase in CO_2-equivalent emissions from diesel equipment exhaust. For screening purposes, the temporary construction activity GHG emissions were compared to the chronic operational emissions in the SCAQMD's interim threshold of 10,000 tons per year. Worst year annual construction activities generating a total of 498 metric tons are well below this threshold. For construction activity emissions, SCAQMD GHG guidelines recommend that one-time construction emissions be amortized over the useful lifetime of the project. For a 30-year assumed project life, amortized GHG construction emissions would be 17 tons per year.

The project is anticipated to increase electrical consumption as follows:

ASR Wells:	Operate by gravity flow, no pumping
Booster Stations:	2.3 MW per booster station (assume 4)
Regenerable or Non-regenerable Facilities:	1.1 MW per day per treatment (assume 2)
Tertiary Treatment-VSD Plant Upgrade:	8 MW/day

Electricity use would result in GHG emissions from the fossil fueled fraction of Southern California's electrical resource. The California Climate Action Registry estimates that Southern California contributes 0.331 metric tons (MT) of GHG per megawatt hour (MWH) of electrical consumption.

Annual increased project electrical consumption and associated GHG generation was calculated as follows assuming full system operation for 365 days/year:

19.4 MW/day or 7,081 MW/year
7,081 MW/year x 0.331 MT/MW = 2,344 MT/year

The project is assumed to require 5 additional employees for which on-road travel would increase CO_2 by 28,640 lbs/year or 14.3 "short" tons or 13.0 "metric" tons per year. This is added to the 2,344 MT per year of CO2 increase from electrical consumption for a total operational increase of 2,357 MT/year. The SCAQMD screening threshold of 10,000 metric tons per year of CO_2-equivalent GHG emissions will not be exceeded. Both the construction and operations GHG emissions are far below the 10,000 MT per year advisory threshold for impact significance.

GHG emissions are implicated in the acceleration of global warming experienced in the last several decades. Climatic impacts are global in scale. Any project-specific contribution to the global issue is miniscule. In the absence of any definitive thresholds of significance, the GHG emphasis on a project-specific level is to incorporate project design features that reduce energy consumption and reduce vehicular travel as much as is reasonably feasible. The project generates limited levels of GHG emissions. The project would create reclaimed water and groundwater recharge of the underlying aquifer. The provisions and use of recycled water is considered GHG positive because it offsets groundwater pumping and import of water. Transport of imported water over long distances is very energy intensive. Therefore, the overall project is expected to result in a net decrease in GHG emissions to meet current water demand for the project service area.

It is highly improbable that any measurable change in air movement, moisture, temperature, or climate change would occur as a direct result of future project implementation since none of the activities, construction or operation, is of a scale that could adversely impact these climate/weather parameters.

- **Would the proposed project create objectionable odors affecting a substantial number of people or otherwise have a substantial, demonstrable negative aesthetic effect?**

During construction and operation, the proposed project would include vehicle operation with odors associated with exhaust emissions from the consumption of petroleum products (gasoline, diesel, etc.). During construction, odors associated with paving could also occur, but would be very short-term. None of these odors are normally considered so offensive as to cause sensitive receptors to complain. Both based on the short-term nature of some of these emissions and the characteristics of all of these emissions, no significant short-term odor impacts are forecast to result from implementing the proposed project.

Wastewater treatment plants have potential odor issues. Odor emissions derive primarily from sewage solids handling and processing. The only proposed new treatment facility locations, the satellite treatment facilities, would treat wastewater that has already been processed to remove solids. No new sources of odors or new locations of processing of potentially odiferous components are proposed. The proposed IWA Recycled Water Project is not forecast to affect sensitive receptors located within the vicinity of the proposed facilities with respect to odors.

- **Would the proposed project result in population increases within the regional statistical area which would be in excess of that projected in the AQMP and in other than planned locations for the project's build-out year?**

The Initial Study found that the proposed IWA Recycled Water Project would have a less than significant impact with respect to causing or contributing to population increases, either directly or indirectly. The Initial Study found that implementation of the proposed project would not contribute to significant growth, specifically growth beyond that permitted by the general plans of land use jurisdictions in the project area as allocated in regional planning documents. The purpose of the proposed project is to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area. The Initial Study also found that no displacement of housing, which might necessitate an increase in housing in another location, would be expected to occur as a result of the Project. A full discussion of this topic can be found in Section XII, Population and Housing, of the Initial Study. Because the potential for the project to result in population growth

or displacement has already been addressed and found to be less than significant, no significant adverse impact is projected with respect to the Air Quality Management Plan. No further analysis is warranted with respect to induced population and the Air Quality Management Plan. No mitigation is required under this item.

4.2.4 Mitigation Measures

With or without the use of mitigation measures to control air pollutant emission, peak daily construction activity emissions for the proposed project will be below CEQA SCAQMD thresholds. However, the non-attainment status of the SSAB requires that best management practices be employed to minimize dust and equipment exhaust emissions. The Air Quality Impact Analysis identifies mitigation measures that comply with the requirement to employ best management practices.

4.2-1 Using best available control measures during soil disturbance. The menu of enhanced dust control measures includes the following:

- ***Limit the disturbance "footprint" to as small an area as practical.***
- ***Water all active construction areas at least twice daily.***
- ***Cover all off-site haul trucks or maintain at least 2 feet of freeboard.***
- ***Pave or apply water four times daily to all unpaved parking or staging areas.***
- ***Sweep or wash any site access points within 30 minutes of any visible dirt deposition on any public roadway.***
- ***Cover or water twice daily any on-site stockpiles of debris, dirt or other dusty material.***
- ***Suspend all operations on any unpaved surface if winds exceed 25 mph.***

4.2-2 Limit allowable idling to 5 minutes for trucks and heavy equipment before shutting the equipment down.

4.2-3 Utilize equipment whose engines are equipped with diesel oxidation catalysts if available.

4.2-4 Utilize diesel particulate filter on heavy equipment where feasible.

4.2-5 Utilize Tier 3 rated diesel engines for heavy equipment.

Implementation of the above measures will assist the SSAB in achieving attainment status with respect to the criteria pollutants that are currently in non-compliance.

4.2.5 Cumulative Impacts

A portion of the air pollution in the SCAQMD is directly caused by human activities in the SSAB, and a substantial portion of the pollution is transported into the basin from upwind sources within the South Coast Air Basin. The human activities within the SSAB that generate air pollutant emissions include motor vehicle use, industrial emissions, and fugitive dust from disturbing native soil cover or other soil. The proposed project is located within an air basin with poor air quality for ozone and particulates. However, the proposed project does not propose any uses, or intensity of uses, that are not already authorized and anticipated under the existing AQMP and local and regional growth management plans.

As detailed above in Tables 4.2-7 through 4.2-21, emissions associated with construction of the individual project components fall below the SCAQMD CEQA significance thresholds for all

criteria pollutants, with or without the use of mitigation. Tables 4.2-22 and 4.2-23 demonstrate that even if all construction activities were to occur simultaneously, construction emissions would fall below the SCAQMD CEQA significance thresholds for all criteria pollutants, with or without the use of mitigation.

As a worst case, Table 4.2-25 summarized combined total worst case unmitigated emissions from construction emissions and employee commuting, assuming that all projects are under simultaneous construction. Emissions would fall below the appropriate federal "de minimis" thresholds, thereby demonstrating conformance with the SIP, even with all projects overlapping in time, with the majority of construction occurring in a single year (pipeline construction would still occur over multiple years) and all construction beginning at the same time.

The proposed IWA Recycled Water Project would require increased electrical consumption to process wastewater to meet recyclable standards. Because electrical power is derived from the regional grid, there is no direct correlation between consumption and the location of where power-generating emissions would be released. Electricity is generated by a combination of fossil fuel combustion and renewable resources (hydro, wind, etc.). There is therefore some unquantified air pollution impact from increased electrical demand, but that impact is regionally cumulative.

The project proposes to use recycled water for irrigation of large-scale landscaping areas and for groundwater recharge of the underlying aquifer. The provisions and use of recycled water is considered GHG positive because it offsets pumping of groundwater and import of water. Transport of imported water over long distances is very energy intensive. Therefore the overall project is expected to result in a net decrease in GHG emissions to meet current water demand for the project service area.

Because of the non-attainment status of the air basin, best management practices for control of air pollutant emissions are required to be employed to minimize dust and equipment exhaust emissions. Mitigation measures have been identified to minimize future emissions during construction and operation of the IWA Recycled Water Project.

Based upon the above analysis, the proposed project would not generate cumulatively considerable criteria pollutant emissions within the SSAB, and would not result in cumulatively significant unavoidable adverse air quality impacts.

4.2.6 Unavoidable and Adverse Impacts

With or without mitigation measures, the individual construction projects are not forecast to result in significant adverse impacts on air quality. Even if all construction activities were to occur simultaneously, construction emissions would fall below the SCAQMD CEQA significance thresholds for all criteria pollutants, with or without the use of mitigation. Short-term impacts of construction are unavoidable but with mitigation, and due to their short duration, would not be considered significant. Long-term impacts of the project, as previously analyzed, would not be considered significant with or without implementation of mitigation. As a worst case, Table 4.2-25 summarized combined total worst case unmitigated emissions from construction emissions and employee commuting, assuming that all projects are under simultaneous construction. Emissions would fall below the appropriate federal "de minimis" thresholds, thereby demonstrating conformance with the SIP, even with all projects overlapping in time, with the majority of construction occurring in a single year (pipeline construction would still occur over

multiple years) and all construction beginning at the same time. The emission forecasts in the analysis above indicate that air quality impacts would not be considered an unavoidable and significant adverse impact.

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4.3 BIOLOGICAL RESOURCES

4.3.1 Introduction

Information presented in this subchapter is taken from the *Biological Resources Assessment and Survey Report* prepared by Tom Dodson & Associates dated November 2010, City and County General Plans and supporting documents, the California Natural Diversity Database (CNDDB) for the project area and species specific documents from state and federal agencies.

Both the California and Federal endangered species acts provide legislation to protect the habitats of listed species as well as the species itself. If a state or federally listed endangered species were determined to be present within the project area, the proposed project may be constrained to avoid, minimize or offset (compensate for) effects to the species. Species specific mitigation measures would need to be agreed upon and implemented to the satisfaction of all jurisdictional agencies. These jurisdictional agencies may include some or all of the following: U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), the Regional Water Quality Control Board (RWQCB), and/or U.S. Army Corps of Engineers (ACOE).

No substantive comments were received at the scoping meeting held for this proposed project that focused on biological resource impacts. Several comments on general biology issues were submitted in response to the Notice of Preparation. The State Water Resources Control Board identified concerns regarding potential impacts of the project to the Beneficial Uses of the Coachella Valley Stormwater Channel (CVSC) and the Salton Sea, and identified concerns with respect to impacts on the wetlands in the CVSC, calling attention to the EPA and State of California's policies of "No Net Loss of Wetlands." Information is provided in this section to address the general concerns expressed regarding species and wetland impacts. Refer to the summary list of comments in Chapter 2 and also to copies of the comment letters themselves in Appendix 8.2 of this Volume of the Draft EIR. Although the CDFG received the Notice of Preparation, the CDFG did not submit a comment letter on the project.

One of the issues identified in the Land Use/Planning category asks if the proposed project would: "Conflict with any applicable habitat conservation plan or natural community conservation plan?" Because this issue is so closely related to the biology resources evaluation contained in this subchapter, the Land Use & Planning issue quoted above has been integrated into this subchapter, and it will be evaluated in the analysis presented below.

4.3.2 Environmental Setting

TDA was contracted by the IWA to perform general biological resources assessment and surveys for the proposed project. The biological study area encompassed all areas potentially affected by the project which include the constructed wetlands treatment ponds located at the VSD WWTP (Ponds), the CVSC southeast of the VSD outlet downstream for 1.5 miles, the proposed locations of the tertiary treatment system facilities (Treatment Facilities) at the VSD WWTP, the proposed location of satellite treatment facilities at Posse Park, and the proposed pipeline routes. Please note that the biological study area did not include the potential four new ASR well sites because their exact location or configuration had not been determined at the time of the biological evaluation. The biological study also did not include the possible satellite treatment facility locations north of the Coachella Canal or adjacent to Indio Municipal Golf

Course. The ASR well sites, the satellite treatment facility alternatives and RO brine treatment evaporation ponds and agricultural field sites must meet mitigation measures identified below or a second tier environmental evaluation will be required in a future, follow-on document. Please refer to Figure 4.3-1a through 4.3-1c for the pipeline alignment and the satellite treatment facility (referred to as "potential groundwater recharge") surveyed. Please refer to Figure 4.3-2 for the portion of the Coachella Valley Stormwater Channel surveyed.

TDA Biologist, Shay Lawrey conducted general biological surveys in the project area on April 5, May 9, and May 19 2010 by noting habitat types, disturbance levels, and animal species. Ms. Lawrey walked the proposed tertiary treatment facilities locations, proposed satellite treatment facility at Posse Park, and around each of the constructed wetlands ponds within the VSD WWTP. For the pipeline routes, Ms. Lawrey drove the proposed alignments and conducted pedestrian surveys in adjacent areas that contained open and accessible land. In addition to the general biological surveys, Ms. Lawrey conducted habitat suitability evaluations in accordance with the relevant, species specific, habitat evaluation guidelines for burrowing owl *(Athene cunicularia*). Based upon the presence of suitable habitat, Ms. Lawrey surveyed 1.5 miles of riparian habitat within the Channel downstream from the VSD outlet between April 15 and July 17, 2010 for the least Bell's vireo [*Vireo bellii pusillus* (LBVI)] and southwestern willow flycatcher [*Empidonax trallii extimus* (SWWF)] pursuant to her USFWS Permit (TE-094308-0) and according to the recommended guidelines provided by the USFWS. On April 5, 2010, botanist C.J. Fotheringham PhD, conducted botanical surveys around the constructed wetlands ponds located at the VSD WWTP and within the Channel 1.5 miles downstream (southeast) of the VSD outlet. Please refer to Figure 4.3-3 for the pond area surveyed. The field surveys were conducted within an appropriate spring-summer survey window when most species would be readily detectable.

Wildlife species were detected during field surveys by sight, calls, tracks, scat, or other sign were recorded. In addition to species actually observed, expected wildlife usage of the site was determined according to known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. The floral and faunal species surveys focused on a number of primary objectives: (1) identify potential suitable habitat for special status wildlife within the Project area; (2) identify special status wildlife and/or plants within the Project area; and (3) identify protected resources such as streams and drainages.

A copy of the General Biological Resources Assessment is provided as Appendix 2 in Volume 2, Technical Appendices, of the EIR for those interested in the more detailed evaluation of these resources. Portions of the text from this Assessment are incorporated in the following findings and analysis.

Existing habitat conditions and species observations are described below for each area of proposed improvements: the proposed locations of the tertiary treatment system facilities at the VSD WWTP, the proposed location of satellite treatment recharge facility at Posse Park, the proposed pipeline routes, the constructed wetlands treatment ponds located at the VSD WWTP and the Coachella Valley Stormwater Channel southeast of the VSD outlet downstream for 1.5 miles.

<u>Treatment Facilities</u>
The tertiary treatment system facilities are proposed at several alternative locations within the existing VSD WWTP. The WWTP is a maintained site that contains various buildings, water treatment facilities, introduced landscaping plants, and paved, gravel and/or compacted dirt

access roads and parking areas. The locations of the proposed facilities consist of disturbed bare ground and/or disturbed ruderal vegetation. No suitable habitat capable of supporting any sensitive species exists on site. No sensitive species or evidence of sensitive species was observed during the survey. The results show that no sensitive biological resources occur in the areas proposed for the tertiary treatment system facilities.

Satellite Treatment Facility

The potential satellite treatment facility locations that were surveyed for biological resources are proposed near Posse Park, north of 42nd street, east of the Indio Municipal Golf Course and west of the Terra Lago Golf Club. Please refer to Figure 4.3-1b for the satellite treatment facility area that was surveyed. The proposed locations contain open, previously disturbed ground and compacted dirt access paths. The ground cover in these locations consists of disturbed bare ground and/or disturbed ruderal vegetation. No sensitive species or evidence of sensitive species was observed during the survey. There is a potential for burrowing owl to move into one of these areas and set up a territory. No other sensitive species have the potential to occur within the proposed recharge locations due to the lack of suitable habitat and level of disturbance.

Pipelines

The pipeline routes generally extend from Dillon Road on the northeast to Adams Street on the west and Avenue 48 on the south. Most of the proposed pipeline routes lie within the pavement of existing rights-of-way of various public roadways and parking lots. There a few small segments of the pipeline routes that occur in dirt access roads and undeveloped fields. Existing land uses along the pipeline routes include retail businesses and residential neighborhoods. Portions of the pipeline routes (along 42nd Avenue and from Van Buren Street east along 44th Avenue and north along Dillon Road) lie adjacent to open land that primarily contains patches of Sonoran creosote bush scrub and desert saltbush scrub habitats and randomly scattered pockets of desert sink scrub and stabilized desert sand field habitats.

Sonoran creosote bush scrub is the most widespread vegetation type in the Colorado Desert. It is co-dominated by creosote bush (*Larrea tridentata*) and burrobush (*Ambrosia dumosa)*. The transition to desert saltbush occurs as the soil becomes heavier and the salt content increases. Sonoran creosote bush scrub has low species diversity and the broad spacing of the shrubs, usually with bare ground between.

Desert saltbush scrub includes various species of saltbush in a nearly uniform stand of shrubs, forming a more complete cover than in creosote bush scrub. This community occupies areas where fine-textured, poorly drained soils with high salinity and/or alkalinity occur. One or more species of *Atriplex* are dominant in this community, including allscale (*Atriplex polycarpa)* and four-winged saltbush (*Atriplex canescens* var. *linearis*).

Desert sink scrub occurs at lower elevations on poorly drained moist to wet soils with high alkalinity and/or salinity. Desert sink scrub appears to displace desert saltbush scrub in areas of a high water table and a salt crust at the surface. Pickleweed (*Salicornia virginica*), iodine bush (*Allenrolfea occidentalis*), and bush seepweed (*Suaeda moquinii)* are characteristic of this community.

A stabilized sand field is located west of Dillon Road and east of the Terra Lago Golf Club. This sand accumulation is characterized by consistent cover of vegetation stabilized by shrubs, scattered low annuals, and perennial grasses. This community intergrades with the sandier

phases of adjacent creosote bush scrub and includes perennial plant species such as creosote bush, four-wing saltbush, California croton, and indigo bush.

According to Figure 4-20b of the September 2007 Re-circulated Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP), the pipeline route along Dillon Road traverses part of the East Indio Hills Conservation Area which includes Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel conserved habitat. The adjacent habitats described above provide suitable habitat for Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel and for burrowing owl and crissal thrasher. None of these species or evidence of these species was observed during the survey. The project information provided at the time of survey indicated that the construction envelope for pipeline installation would occur entirely within paved and/or dirt road rights-of-way and that no aspect of construction, including side casting, would go beyond the existing developed road ways and encroach into open land.

Constructed Wetlands

The constructed wetland treatment ponds were surveyed to assess the potential biological impacts of changes to the quantity of water discharged to the ponds. Figure 4.3-3 shows the location of the constructed wetlands. Coastal and valley freshwater marsh habitat (Holland community 52410) occurs around the constructed wetland treatment pond margins. The habitat surrounding the open water of the ponds is largely dominated by *Bolboschoenus (Scirpus) maritimus* (>90% of the vegetation cover) with some *Salix sp., Atrriplex sp.* and *Heliotropium curassavicum* near the edges. The ponds provide open water and marsh habitats that support nesting and foraging for a diverse avian fauna. The ponds constitute an environmentally rich area that functions as a secluded wetland ecosystem in the middle of the desert and provide a small link in the Pacific Flyway as birds migrate along the coastal corridor. Due to the inviting expanse of habitat, the ponds also function as a public bird viewing area. Several species of resident, migratory, and special status birds visit or live at the ponds. The most common birds observed at the ponds during the survey include eared grebes, ruddy ducks, black-necked silts, lesser yellow legs, common loons, Canada geese, cinnamon teals, greater scaups, common goldeneyes, common moorhens, western gulls, common terns, brown pelicans, snowy egrets, Wilson's phalarope, least bitterns, and mallards.

Four individuals of the plant *Abronia villosa,* potentially a special status variety, were found near the raptor houses located adjacent to the ponds. It could not be determined whether the *Abronia villosa* was the special status variety *aurita* or the more common variety *villosa* due to lack of seeds at the time of the survey.

Coachella Valley Stormwater Channel

Coachella Valley Stormwater Channel was surveyed from the VSD outlet downstream for 1.5 miles to assess the potential biological impacts of changes to the quantity of water discharged to the Channel. Figure 4.3-3 shows the location of the surveyed portion of the Channel. The apparent extensive and ongoing mechanical disturbance on the banks of the channel is attributed to flood control maintenance, which appears to be the primary cause of disturbance within the channel. The center flow line of the channel within the survey area supports Sonoran cottonwood-willow riparian forest (Holland community 61810) in a multi-canopy layer habitat that varies in width from 30 to 75-feet. The under story consists of cattail and other native herbaceous riparian plants. The shrub and tree canopy are primarily composed of arroyo, black and sandbar willow (*Salix lasiolepis, S. gooddingii* and *S. exigua*), cottonwood (*Populus fremonti*), Scirpus (*Bolboschoenus maritimus),* saltcedar (*Tamarix*

ramosissima), and *Arundo donax.* Flowing and pooled water was present during the survey, and based upon the extensive riparian growth and presence of fish in the water, this section of stream appears to flow year round.

Higher on the channel banks, the survey area may have once supported mesquite bosque (Holland community 61820) or desert dry wash woodland (62200), but the characteristic *fabaceae* shrub species is currently missing from the on-site habitat. The vegetation along the upper sides of the channel is typical of desert dry washes and other disturbed, sandy areas. Dominant species include arrowweed (*Pluchea sericea*), inkweed (*Suaeda moquinii*), saltcedar (*Tamarix ramosissima*) and Russian thistle (*Salsola spp.*).

The vegetation upstream of the VSD outlet is markedly different from that downstream with no apparent permanent wetlands upstream. Species upstream of the outlet in the channel were those found higher on the sides of the channel downstream of the outlet, with *T. ramosissima*, *P. sericea*, and *S. moquinii* being the most dominant by cover.

A total of 42 plant species were encountered within the channel survey area, 19 (45%) of which were non-native. One species encountered within the Channel survey area is potentially a special status variety. Of the 18 special status plant species identified in the CNDDB, potential habitat exists within the channel for 15 special status plant species. Five individuals of *Abronia villosa* were found scattered on higher areas of the bank. Again, whether it was the special status variety *aurita* or the more common variety *villosa* could not be determined due to lack of seeds at the time of the survey. Regardless of which variety is present on the site, it is unlikely that changes in channel water flow would have any effect on this species as it is not a wetland species and responds to seasonal rains.

Ninety bird species were detected during the 2010 focused surveys. The most frequently detected species were birds typical of lowland riparian habitats in southern California such as the mourning dove (*Zenaida macroura*), black-chinned hummingbird (*Archilochus alexandri*), black phoebe (*Sayornis nigricans*), bushtit (*Psaltriparus minimis*), house wren (*Troglodytes aedon*), yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), and lesser goldfinch (*Spinus psaltria*).

No LBVI or SWWF were detected during the survey and no aspect of the survey limited the results. The focused survey results show that LBVI and SWWF do not currently occupy the Channel from the VSD outlet downstream for 1.5 miles. No LBVI or SWWF were seen or heard over the course of the 12 week survey period and according to the CNDDB (September 2010 update), these species have not been documented in the Indio, Myoma, La Quinta or West Berdoo Canyon quads. Given the absence of LBVI and SWWF within the study area, there is no risk of taking individuals of either species in conjunction with implementing the proposed project. A nesting pair of burrowing owl was observed on the south side of the channel bank. Figure 4.3-2 shows the location of the burrowing owls.

4.3.3 Regulatory Aspects

4.3.3.1 Federal Endangered Species Act

The USFWS administers the federal Endangered Species Act (ESA) of 1973. The ESA provides a legal mechanism for listing species as either threatened or endangered, and a process of

protection for those species listed. Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include adverse modification of habitats used by a threatened or endangered species during any portion of its life history. Under the regulations of the ESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act. Take authorization can be obtained under Section 7 or Section 10 of the ESA.

This project will not result in, and there is no risk of, take of a federally listed species.

The ESA requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species, or destroy or adversely modify its critical habitat, if any is designated.

According to Figure 4-22d, and 6-2 of the CVMSHCP, no aspect of the project falls within the desert tortoise and linkage conservation area or within the Coachella Valley fringe-toed lizard preserve.

4.3.3.2 Migratory Bird Treaty Act

The USFWS also affords protection to migratory birds through the Migratory Bird Treaty Act (MBTA). The MBTA protects all resident and migratory wild birds found in the United States, except the house sparrow, starling, feral pigeon, and resident game birds. Resident game birds are managed separately by each state. The MBTA makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import or export any migratory bird including feathers, parts, nests or eggs.

4.3.3.3 Waters of the United States and Streambeds

Portions of the pipeline routes cross or follow along the Coachella Valley Stormwater Channel the Whitewater River and Coachella Canal, which are jurisdictional channels. If the project results in alterations to the bed, bank or channel of any of these, the following regulatory framework may apply.

The U.S. Corps of Engineers (Corps) regulates discharges of dredged or fill material into *waters of the United States*. These *waters* include wetlands and non-wetland bodies of water that meet specific criteria. The Corps' regulatory jurisdiction pursuant to Section 404 of the Federal Clean Water Act (CWA) is founded on a connection, or nexus, between the water body in question and interstate commerce. This connection may be direct through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce, or may be indirect, through a nexus identified in the Corps regulations. One of the mechanisms adopted by Congress to achieve restoration and maintenance of the chemical, physical, and biological integrity of the Nation's waters is a prohibition on the discharge of any pollutants, including dredged or fill material, into "navigable waters" except in compliance with other specified sections of the Act.

The Regional Water Quality Control Board also regulates discharges of dredged or fill material into *waters of the United States* pursuant to Section 401 of the Federal CWA, however they also have regulatory authority over waste discharges into Waters of the State, which may be isolated, under the Porter-Cologne Water Quality Control Act issued by the State Water

Resources Board. The Regional Board's role is to ensure that disturbances within waterways do not cause water quality degradation.

Unlike the Corps, CDFG regulates not only the discharge of dredged or fill material, but all activities that alter streams and lakes and their associated habitat. The CDFG, through provisions of the California Fish and Game Code (Sections 1601-1603), is empowered to issue agreements for any alteration of a river, stream, or lake where fish or wildlife resources may be adversely affected. Streams (and rivers) are defined by the presence of a channel bed and bank, and at least an intermittent flow of water. The CDFG typically extends the limits of their jurisdiction laterally beyond the channel banks for streams that support riparian vegetation. In these situations the outer edge of the riparian vegetation is generally used as the lateral extent of the stream and CDFG jurisdiction. CDFG regulates wetland areas only to the extent that those wetlands are a part of a river, stream, or lake as defined by CDFG. Seasonal ponds are within the CDFG definition of wetlands.

4.3.3.4 California Endangered Species Act

CDFG also administers the California Endangered Species Act (CESA). The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is likely to become an endangered species in the near future in the absence of special protection or management, and a rare species is one that may become endangered if its present environment worsens. "Species of Special Concern" is an informal designation used by CDFG for some declining wildlife species that are not proposed for listing as threatened or endangered, such as the burrowing owl. This designation signifies that these species are recognized as sensitive by CDFG and may require a special permit for direct impacts.

In coordination with the USFWS the CDFG also administers the MBTA which provides protections for nesting birds that are both residents and migrants, whether or not they are considered sensitive by resource agencies. The CDFG Code 3503 makes it illegal to destroy any birds' nest or any birds' eggs. Code 3503.5 further protects all birds in the orders Falconiformes and Strigiformes (Birds of Prey, such as hawks and owls) and their eggs and nests from any form of take.

4.3.4 <u>Project Impacts</u>

4.3.4.1 Significance Thresholds

The impact evaluation presented below focuses on the proposed physical changes to area landscape and any potential adverse impacts these changes may have on the biological resources. Implementation of this project has the potential to have a significant impact on biological resources within the project area.
The biological resource issues of concerns that would cause impacts to biological resources to be considered significant according to CEQA Guidelines (§15064 and Appendix G) are if the direct, indirect or cumulative effects of the proposed project would:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional

plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? A comparable threshold is expressed in the following language in the "Land Use and Planning" section of the Initial Study Environmental Checklist Form. It reads: "Conflict with any applicable habitat conservation plan or natural community conservation plan?"

The California Native Plant Society (CNPS) publishes and regularly updates the "Inventory or Rare and Endangered Vascular Plants of California." CNPS gathers information from the CNDDB, the CDFG, and amateur and professional botanists throughout the state. Plants listed by CNPS, but not officially listed by the State, nevertheless receive protection under CEQA: that is, impacts to CNPS listed species may be considered significant.

Comments received in response to the NOP included the California Regional Water Quality Control Board (RWQCB) statement that the EIR should consider potential impacts of the project to the Beneficial Uses of the Coachella Valley Storm Water Channel and the Salton Sea as well as impacts of the project to wetlands in the CVSC with respect to the EPA and State of California's policy of "No Net Loss of Wetlands," including providing alternatives and/or mitigation if necessary.

Finally, the State CEQA Guidelines also incorporate the following threshold for determining significant biological resource impacts. Section 15065, "Mandatory Findings of Significance," states that a project having the following impacts shall be considered significant. "The project has the potential to: substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species;…" These issues are addressed as part of the general discussion under issues below.

Each of these issues will be evaluated in the detailed impact analysis presented below. These thresholds of significance will be utilized in this EIR to evaluate the potential impacts associated with implementation of this project.

a. Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

There are 40 special status species documented within the Indio, Myoma, La Quinta and West Berdoo Canyon Quadrangles (CNDDB 2008 updated September 2010). Of these 40 sensitive species, suitable habitat exists adjacent to the eastern pipeline routes and to the Channel for 10 species which include the Palm Springs pocket mouse, chaparral sand-verbena, burrowing owl, flat-tailed horned lizard, American badger, Crissal thrasher, Le Conte's thrasher, Coachella Valley fringe-toed lizard, Palm Springs round-tailed ground squirrel, and Mecca-aster. Each of these species has been documented within 2 miles of the study area boundaries which are bounded by the pipeline routes. As described under Section 4.3.2 Environmental Setting, site specific surveys were conducted to assess biological resources that could be impacted by the proposed project. Results of the surveys with respect to sensitive species are provided below.

Treatment Facilities

No suitable habitat capable of supporting any sensitive species exists on the tertiary treatment system facilities sites. No sensitive biological resources occur in the areas proposed for the tertiary treatment system facilities. Therefore, this aspect of the project will not result in direct or indirect impacts to threatened or endangered species, species of concern or species proposed for listing. Installation of the treatment system facilities will not result in the loss of a listed species and will not result in the modification of sensitive habitat. Further study or analysis is not warranted or required.

Satellite Treatment Facilities

The proposed satellite treatment facility locations consist of disturbed bare ground and/or ruderal vegetation. Although no sensitive species were found and none are expected to occur at the proposed satellite treatment facility locations evaluated, these locations should be re-evaluated for burrowing owl prior to construction. Mitigation is provided to ensure that no adverse impact would occur if burrowing owl were to occupy the recharge facilities prior to initiating construction activities. Mitigation is also provided that establishes minimum standards for biological evaluations that will be conducted if satellite treatment facility locations that have not been evaluated are selected for development. The same mitigation could be applied to ASR well site selection and RO brine discharge treatment sites.

Pipelines

Pipeline installation will occur entirely within paved and/or dirt road rights-of-way and no aspect of construction, including side casting, would go beyond the existing developed road ways and encroach into open land. Although Figure 4-20b of the CVMSHCP indicates that the proposed pipeline route along Dillon Road traverses part of the East Indio Hills Conservation Area, no adverse direct impact will result to Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel conserved habitat since the construction envelope lies entirely within paved roadways. No direct, adverse impacts to biological resources are expected to result from installing the pipelines.

However, considering that portions of the pipeline routes (along 42nd Avenue and from Van Buren Street east along 44th Avenue and north along Dillon Road) lie adjacent to open land that contain patches of native habitat (such as Sonoran creosote bush scrub, desert saltbush scrub, desert sink scrub, and stabilized desert sand field), mitigation is provided to avoid and/or

minimize potential indirect adverse impacts to biological resources. Mitigation would provide for preconstruction surveys that would ensure no sensitive species have inhabited the project area of impact since completion of the biological survey, would minimize the potential for inadvertent introduction of exotic species, would minimize the potential for accidental construction impacts to areas outside of the identified construction areas and would provide construction workers with the information necessary to comply with biological regulatory requirements for the project.

Constructed Wetlands

The possible elimination of the constructed wetland treatment ponds would result in an adverse impact on the migrating and resident water fowl that currently utilize the ponds for resting, foraging and nesting. While no special status species were observed at the ponds during the surveys conducted in the late spring, it is possible that special status species depend upon the ponds at other times of the year, either during migration or in the winter. The biological assessment recommends that elimination of the ponds be avoided, and that if total avoidance is not possible, it recommends that at least half of the pond system be retained and remain functional. The constructed wetlands treatment capacity is 1.0 MGD. If the constructed wetland treatment ponds were completely removed, it would result in significant adverse biological impacts.

Four individuals of the plant *Abronia villosa,* potentially a special status variety, were found near the raptor houses located adjacent to the ponds. It could not be determined whether the *Abronia villosa* was the special status variety *aurita* or the more common variety *villosa* due to lack of seeds at the time of the survey. If the area where the *A. villosa* occurs will be impacted by the project (Figures 4.3-4a and 4.3-4b show where A. villosa is in the vicinity of the ponds), mitigation is provided to ensure that adequate measures are taken with respect to this species.

Coachella Valley Stormwater Channel

The riparian habitat in the channel contains a dense mixture of native and non-native vegetative components that have grown into a multi layered canopy with intricate structure. This habitat is considered suitable for LBVI and SWWF and as such focused surveys were conducted to determine their presence or absence. No LBVI or SWWF were detected during the 2010 focused surveys. However, a burrowing owl pair was detected on the south side (dry side) of the south bank of the channel approximately 0.8 miles downstream from the outfall. Additionally, five individuals of *Abronia villosa* were found scattered on higher areas of the north side (wet side) of the south bank. The variety (special status variety *aurita* or the more common variety *villosa*) could not be determined due to lack of seeds at the time of the survey. Regardless of which variety is present along the Channel, any proposed changes in the water discharge regime are unlikely to affect *Abronia villosa* or burrowing owl because neither is a wetland or riparian obligate species. Mitigation is provided that will reduce impacts to the burrowing owl in the event that construction activities would be planned in the vicinity of the owl burrows.

Neotropical migrants such as the yellow-rumped warbler *(Dendroica coronata),* orange-crowned warbler *(Vermivora celata),* blackthroated gray warbler *(Dendroica nigrescens),* MacGillivray's warbler *(Oporornis tolmiet),* white-crowned sparrow *(Zonotrichia leucophrys),* golden-crowned sparrow *(Zonotrichia atricapilla),* song sparrow *(Melospiza melodia),* common yellowthroat *(Geothlypis trichas),* yellow warbler *(Dendroica petechia),* yellow-breasted chat *(Icteria virens),* and ruby-crowned kinglet *(Regulus calendula)* depend on the deciduous riparian trees and shrubs growing in the Channel for foraging during migration. The mature trees provide numerous cavities for cavity-dependent wildlife and the tall trees are used by nesting raptors.

Currently, up to 6.5 MGD of effluent is discharged into the Channel from the VSD WWTP. The project proposes to reduce discharges to 0.5 MGD and according to the water balance study prepared for this project by Thomas Harder and Company (THC, 2009) available in Volume 2 Technical Documents of this DEIR, discharges of 0.5 MGD are forecast to be sufficient to maintain the riparian vegetation growing in the center flowline of the channel. Under this assumption, the habitat will remain unaffected. However, to ensure that the riparian habitat is not adversely impacted following reductions in effluent discharge, mitigation is provided.

The mitigation requires the IWA, in coordination with the Cabazon Indian Reservation, to implement a long-term habitat and wildlife monitoring plan that includes either payment into an existing exotic species control and management program or implementation of such a program. Rehabilitation of the survey area could restore the degraded habitat (with approximately half non-native plant species) back to its previous native habitat condition and enhance the function of the existing habitat by converting scattered “pockets” of nonnative vegetation to native vegetation. IWA would be responsible for funding and implementing this measure as part of its management responsibilities under this EIR. Restoration and enhancement of this area would increase the habitat continuity and ecological integrity of the area and would provide more functional habitat.

Restoration should include nonnative species removal, maintenance and monitoring and might include active re-vegetation following nonnative species removal to replace lost tree canopy cover as soon as possible to prevent temporal habitat loss for migratory birds and local resident wildlife and to prevent the colonization of the area by noxious species. Implementation of these recommendations would be contingent upon the cooperation of and concurrence by the Cabazon Indian Reservation.

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game of U.S. Fish and Wildlife Service?

According to Figure 4-22d, and 6-2 of the CVMSHCP, no aspect of the project falls within the desert tortoise and linkage conservation area or within the Coachella Valley fringe-toed lizard preserve. Although Figure 4-20b of the CVMSHCP indicates that the proposed pipeline route along Dillon Road traverses part of the East Indio Hills Conservation Area, no adverse direct impact will result to Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel conserved habitat since the construction envelope lies entirely within paved roadways. Mitigation is provided that reduces the potential for indirect adverse impacts to sensitive habitats to a less than significant level.

The potential impacts to the riparian/wetland habitat Coachella Valley Stormwater Channel due to reductions in IWA discharges is discussed herein and in greater hydrologic detail in the hydrology section of this report. Currently, up to 6.5 MGD of effluent is discharged into the Channel from the VSD WWTP. The project proposes to reduce discharges to 0.5 MGD. The water balance study prepared for this project expects that discharges of 0.5 MGD would be sufficient to maintain the riparian vegetation growing in the center flowline of the channel. Under this assumption, the habitat will remain unaffected. However, to ensure that the riparian habitat is not adversely impacted following reductions in effluent discharge, mitigation is provided that would ensure that the reduction in effluent would not adversely impact riparian and wetland habitat in the Channel.

The possible elimination of the constructed wetland treatment ponds would result in an adverse impact on the migrating and resident water fowl that currently utilize the ponds for resting, foraging and nesting. While no special status species were observed at the ponds during the surveys conducted in the late spring, it is possible that special status species depend upon the ponds at other times of the year, either during migration or in the winter. The biological assessment recommended that elimination of the ponds be avoided, and further stated that if total avoidance is not possible, then the biological assessment recommended that at least half of the pond system be retained and remain functional.

Based on the analysis in the Biological Resources Assessment, the proposed project has the potential to have direct adverse impacts on riparian habitat in the Channel and on the wetland habitat in the constructed wetlands. The implementation of the mitigation provided in this section can reduce the potential for adverse impacts to the Channel to a less than significant level. Adverse impacts to the wetland habitat in the constructed wetland ponds remains significant and adverse even with implementation of the proposed mitigation measures if the wetland area is reduced by more than half.

c. Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The pipeline routes may affect the Coachella Valley Stormwater Channel/ Whitewater River and the Coachella Canal. If the bed, banks or channel are to be altered by the project, then permits from the Corps, RWQCB, and CDFG may be required. Permits potentially required include CWA Sections 404 and 401 permits, and a Fish and Game Code, Section 1602, Streambed Alteration Agreement. Mitigation is outlined which can be implemented to offset or compensate for both the temporal and permanent loss of riparian habitat in the Stormwater Channel that will occur as a result of the proposed project. Adverse impacts to the wetland habitat in the constructed wetland ponds remains significant and adverse even with implementation of the proposed mitigation measures if the wetland area is reduced by more than half. If the constructed wetlands are reduced in size by less than 1/2, the proposed project would result in a net loss of wetland habitat, but this would not be considered a significant adverse impact.

d. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The primary treatment facilities are proposed within existing developed wastewater treatment compounds and have no potential to impact wildlife movements. The satellite treatment facilities would be small scale facilities located on ruderal sites adjacent to developed properties. Development of satellite treatment facilities on the proposed locations would have no significant impact on wildlife movements. The pipelines proposed as part of the project would be located below the ground surface, and thus would have no potential to impact wildlife movements after completion of construction. The constructed wetland ponds function as a secluded wetland ecosystem in the middle of the desert and provide a small link in the Pacific Flyway, as birds migrate along the coastal corridor. The Coachella Valley Stormwater Channel serves as a wildlife movement corridor for resident species and as habitat for migratory birds. Both the habitat provided by the constructed wetland ponds and the riparian habitat downstream of the VSD outlet in the Coachella Valley Stormwater Channel have the potential to be adversely impacted by the proposed project.

To ensure that the riparian habitat remains in form and function within the Coachella Valley Stormwater Channel following reductions in effluent discharge proposed by the project, specific actions are recommended. These actions include: 1) exotic plant removal; 2) botanical monitoring; and 3) wildlife monitoring. In addition, any habitat loss of greater than 20 percent in spatial extent or quality, as determined by the vegetation monitoring is recommended to be offset by habitat restoration or replacement. Mitigation is incorporated to ensure that no adverse impact to the quantity or quality of riparian habitat within the Channel occurs as a result of the project.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The City of Indio Municipal Code 98.09 and 97.022 prohibit impacts to public trees and shrubs unless a permit has been procured from the City. Construction of segments of the IWA Recycled Water Project pipelines has the potential to impact public trees and shrub. Therefore, mitigation will be required that conforms to the local jurisdiction requirements. No other local policy or ordinance protecting local biological resources was found, and no other impacts are expected.

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? Or Conflict with any applicable habitat conservation plan or natural community conservation plan?

The project occurs within the CVMSHCP Planning area. According to Figure 4-22d, and 6-2 of the CVMSHCP, no aspect of the project falls within the desert tortoise and linkage conservation area or within the Coachella Valley fringe-toed lizard preserve.

According to Figure 4-20b of the CVMSHCP, the pipeline route along Dillon Road traverses part of the East Indio Hills Conservation Area which includes Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel conserved habitat. The adjacent habitats described above provide suitable habitat for Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel and for burrowing owl and crissal thrasher. None of these species or evidence of these species was observed during the survey. Although Figure 4-20b of the CVMSHCP indicates that the proposed pipeline route along Dillon Road traverses part of the East Indio Hills Conservation Area, no adverse direct impact will result to Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel conserved habitat since the construction envelope lies entirely within paved roadways.

After careful review of the project details as they relate to the CVMSHCP, the biological resources assessment determined that the project is consistent with the goals and policies of the CVMSHCP. No other HCP or natural community conservation plan is known to occur within the project area of impact. No impact is expected, and no mitigation is required.

g. Plants listed by CNPS, but not officially listed by the State, nevertheless receive protection under CEQA: that is, impacts to CNPS listed species may be considered significant.

Based on the botanical survey conducted for this project, the only possible special status plant species located within the area of impact is *Abronia villosa.* Individuals of the plant *Abronia villosa,* potentially a special status variety, were found near the raptor houses located adjacent to the ponds and along the upper banks of the Coachella Valley Stormwater Channel. It could not be determined whether the *Abronia villosa* was the special status variety *aurita* or the more

common variety *villosa* due to lack of seeds at the time of the survey. Regardless of which variety is present along the Channel, any proposed changes in the water discharge regime are unlikely to affect *Abronia villosa* because it is not a wetland or riparian obligate species, but rather responds to seasonal rains. Mitigation is provided to reduce impacts to a less than significant level if impacts to the constructed wetlands will include disturbance of the area around the raptor houses where *Abronia villosa* was observed.

Mitigation is also provided that can reduce the potential for the introduction of nonnative plant seeds to a less than significant level.

Native plant populations may be indirectly impacted as a result of increases in dust which may negatively impact pollinator activity. This type of indirect impact can be mitigated by implementing standard "Best Management Practices" (BMPs) that include dust control measures. BMPs for dust control are provided in the Air Quality section of this document. No additional mitigation for this issue is required under this item.

Specific Issues Raised in Response to the Notice of Preparation and at the Scoping Meeting

Several specific questions regarding biological resource impacts of the potential IWA Recycled Water Project were raised in the comment letter from the Regional Water Quality Board. Copies of this letter are reproduced, with comment bracketing, in Appendix 8.2 of this DEIR. Summaries of comments relevant to the Biological Resources section, and responses to these comments, are presented in the following text.

Comment: The EIR should consider potential impacts of the project to the Beneficial Uses of the Coachella Valley Storm Water Channel and the Salton Sea.

Response: Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Coachella Valley Stormwater Channel are freshwater replenishment; warm freshwater habitat; wildlife habitat; protection of rare, threatened or endangered species, and contact and non-contact water recreation (although recreation uses are listed as unauthorized uses). Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Salton Sea (to which the Coachella Valley Stormwater Channel is tributary) are aquaculture; contact and non-contact water recreation; warm freshwater habitat; wildlife habitat; protection of rare, threatened or endangered species, and potentially for industrial service supply.

The potential impacts of the proposed project on the water quality-related beneficial uses of the effected waterways are addressed in greater detail in Section 4.5 Hydrology of this document. Extensive mitigation outlined in this Subchapter requires ongoing monitoring and mitigation that ensures the maintenance of the riparian habitat in the Channel immediately downstream of the VSD outlet. As is discussed in detail in Section 4.5 Hydrology, the effluent discharged by the VSD appears to be primarily responsible for maintaining the riparian habitat in the first 1.5 miles downstream of the outlet, but becomes a progressively negligible proportion of Channel flows thereafter where agricultural runoff and other flows dominate. USGS gauges provide historical data that Channel flows upstream of VSD are 2,700 AF/yr and flows near the Salton Sea are 79,000 AF/yr. VSD WWTP discharges approximately 7,000 AF/yr of treated effluent. The VSD effluent accounts for less than 10% of the Channel

contribution to the Salton Sea, which is only one of many surface and subsurface waters that flow to the Sea a volume of inflow estimated at 1,346,000 AF/yr (Tetra Tech 2000 as cited in THC, 2009.) As proposed, reduction in VSD effluent discharged to the Channel could result in a reduction of less than one-half of 1 percent of the total flow in the Sea (this assumes that VSD discharges all reach the Sea) and would not have an impact on beneficial uses of the Salton Sea with the possible exception of water quality related impacts.

According to the Basin Plan, the Salton Sea water quality is primarily constrained by rising salinity, which adversely impacts the recreationally important fisheries that have been introduced into the Sea from the Gulf of California. The salinity levels of the Salton Sea already exceed the levels at which the fisheries are adversely impacted, and salinity levels in the Sea will continue to rise because inflow is primarily high salinity agricultural flows and there is no outflow from the Sea other than by evaporation. While the reduction in VSD effluent would constitute a very small percentage of flow reduction into the Sea, the reduced VSD flows would contribute to a cumulative decrease in total flows into the Sea that has the potential to increase salinity levels more rapidly than would otherwise occur. The Basin Plan identifies several alternatives that could mitigate rising salinity levels and thereby perpetuate the fisheries that have been developed and identified as beneficial uses.

Comment 2: The EIR should consider impacts of the project to wetlands in the CVSC with respect to the EPA and State of California's policy of "No Net Loss of Wetlands," including providing alternatives and/or mitigation if necessary.

Response: As discussed above, this EIR includes extensive mitigation outlined in this chapter that requires ongoing monitoring and mitigation to ensure the maintenance of the riparian habitat in the Channel immediately downstream of the VSD outlet. The discussion in the previous comment illustrates that the VSD flows contribute a very small portion of the total flows into the Salton Sea, and no significant impact on the size of wetland habitat at the Salton Sea is expected to occur as a result of the project. The proposed project has the potential to result in a loss of wetland habitat if the wetland ponds that were constructed by VSD to treat effluent are reduced in size or removed. While the constructed wetlands may not qualify as jurisdictional areas, their loss would contribute to a net loss of wetlands and reduced habitat for resident and migratory birds that depend on wetland habitat.

4.3.5 Mitigation Measures

Burrowing owls are protected by applicable State and/or federal laws. As such, if any of these species are found on-site at the time of construction, all activities likely to affect the animal(s) should cease and the IWA and regulatory agencies should be contacted to determine appropriate management actions. Such actions may range from avoidance of nests during nesting season, closure of abandoned active nests, creation of new nests, and other measure that may be approved by the regulatory agencies. Importantly, nothing given in this report, including recommended mitigation measures, is intended to authorize the incidental take of any protected species during project construction. Such authorization must come from the

appropriate regulatory agencies, including CDFG (i.e., authorization under section 2081 of the Fish and Game Code) and USFWS.

Burrowing owls were observed during the focused surveys along the Coachella Stormwater Channel and have the potential to occupy the area proposed for satellite treatment facilities. The proposed project activities are not expected to impact the owls located on the channel. The following contingency mitigation measures shall be implemented to ensure that construction activities do not result in significant adverse impacts on this or any other sensitive species, either in the location where they have been documented to occur or in the event that an individual of the species enters another portion of the project area of impact prior to construction.

4.3-1 Within 30 days of the start of any land disturbance activities at the satellite treatment facilities location, a qualified biologist shall conduct focused surveys to determine if burrowing owl have migrated into the project area of potential effect (APE). If the species is encountered, land disturbance activities shall not commence until the biologist has implemented appropriate measures according to the CDFG and USFWS to clear the site for construction.

4.3-2 Following the pre-construction survey the biologist will make a determination: (1) if a biological monitor should be present at the site during all land disturbance activities; or (2) if no further action is required. The biologist/monitor should remain on-call during construction activities. If by chance a sensitive species is encountered during construction following the initial phases of ground disturbance, construction activities shall be halted in the vicinity of the find and the biologist/monitor called to the site. The contractor shall implement the recommendations of the biologist/monitor.

4.3-3 All personnel associated with the construction on the site shall attend a worker education class. This class shall include general information regarding sensitive species that may be found within the project area, including the burrowing owl; relevant Federal and State laws; and worker responsibilities when working in Coachella Valley desert habitat.

The following mitigation can reduce the impact to the native plant community to a less than significant level by reducing the potential for the introduction of nonnative plant seeds.

4.3-4 Whenever feasible, equipment shall be washed prior to reaching the site if it has been working at another job site.

The following mitigation is proposed to reduce the potential for inadvertent adverse construction impacts to adjacent natural areas and organisms outside of the survey areas identified by the proposed project.

4.3-5 All project activities will be limited to a well-defined and visually delineated area. Prior to grading and construction activities, the limits of disturbance will be clearly marked with flagging, stakes, or fencing to prevent accidental intrusion into and degradation of adjacent undisturbed habitat areas.

The following mitigation is proposed to ensure that the riparian habitat remains in form and function within the Coachella Valley Stormwater Channel following reductions in effluent discharge by the proposed project.

4.3-6 A qualified biologist shall conduct qualitative habitat monitoring for a minimum of five (5) years, beginning in the spring prior to the reduction in effluent discharge to the

Coachella Valley Stormwater Channel in order to provide baseline data and to document any habitat changes over time. Annual monitoring, including focused protocol LBVI and SWWF surveys, habitat mapping and general botanical and wildlife surveys, will be conducted to help identify short-term changes in the habitat conditions.

Habitat mapping shall be performed in the spring, between April and July, to document the extent and quality of habitats (including structure, recruitment rates and geographic limits), species diversity, and any significant disease or pest problems. Annual vegetation monitoring shall include the establishment of sampling grids and/or transects with permanent photo stations should be set within the grids and/or transects to provide a visual photo log to track of the changes in habitat over time. Invasive exotic species shall be mapped and removed while minimizing impacts to existing native plants and wildlife species. All wildlife species detected by sight, track, or sign within the monitoring areas should be recorded. More intensive protocol level, LBVI and SWWF surveys should also be conducted by a permitted biologist.

Monitoring for this project would involve the collection and interpretation of biological resource data for five consecutive years and documentation of the effects of the action on the biological resources of concern. Any habitat loss of greater than 20 percent in spatial extent or quality, as determined by the vegetation monitoring is recommended to be offset by habitat restoration or replacement.

Regarding active bird nests, the following mitigation measure will be applied to this program.

4.3-7 To avoid an illegal take of active bird nests, any grubbing, brushing or tree removal will be conducted outside of the State identified nesting season of February 15 through September 1. Alternatively, project impact areas will be evaluated by a qualified biologist prior to initiation of ground disturbance to determine the presence or absence of nesting birds. If an active nest is located in the project construction area it will be flagged and a 300 foot buffer placed around it. No activity will occur within the 300 foot buffer until the young have fledged the nest.

The following mitigation can reduce the impact to rivers, streambeds or wetlands to a less than significant level.

4.3-8 Prior to discharge of fill or streambed alteration of either of the channels along the project alignment, the IWA shall obtain regulatory permits from the U.S. Army Corps of Engineers, Santa Ana Regional Water Quality Control Board and the California Department of Fish and Game, where required. Mitigation can be provided by purchasing into any authorized mitigation bank; by selecting a site of comparable acreage near the site and enhancing it with a native riparian habitat or invasive species removal in accordance with a habitat mitigation plan approved by regulatory agencies; or by acquiring sufficient compensating habitat to meet regulatory agency requirements. Typically, regulatory agencies require mitigation for jurisdictional waters without any riparian or wetland habitat to be mitigated at a 1:1 ratio. For loss of any riparian or other wetland areas, the mitigation ratio will begin at 2:1 and the ratio will rise based on the type of habitat, habitat quality, and presence of sensitive or listed plants or animals in the affected area. A revegetation plan using native riparian vegetation common to the project area shall be prepared and reviewed and approved by the appropriate regulatory agencies. The agencies can impose greater mitigation requirements in their permits, but the IWA will utilize the ratios outlined above as the minimum required to offset or compensate for impacts to jurisdictional waters, riparian areas or other wetlands.

The following measures will be implemented to address plant protection ordinances.

4.3-9 ***In the event that impacts to the constructed wetland treatment ponds will impact the area around the raptor houses, subsequent botanical surveys will be conducted to determine if the Abronia species present is a special status variety. If a sensitive plant species identified in the CNDDB is positively identified on site the plant will be flagged and avoided during construction until the CDFG is notified and takes their opportunity to salvage the plant.***

4.3-10 ***As required by the City or County plant protection ordinances, the project proponents shall avoid City or County street trees and shrubs or procure a permit prior to impacts.***

The following mitigation measures will be incorporated to ensure that project design and site selection reduce impacts to the sensitive biological resources to the extent feasible.

4.3-11 ***Where future project-related impacts will impact undeveloped land, future surveys shall be conducted by a qualified biologist/ecologist. If any sensitive species have the potential to occur on the site where facilities are proposed, or if previous environmental studies have not been conducted, IWA will conduct all surveys in accordance with all established state, federal and generally accepted biological survey protocols for each potential species that may be located onsite. If sensitive species are identified as a result of the survey for which mitigation/compensation must be provided in accordance with regulatory requirements, the following subsequent mitigation actions will be taken:***

a. IWA shall provide compensation for sensitive habitat acreage lost by acquiring and protecting in perpetuity (through property or mitigation bank credit acquisition) habitat for the sensitive species at a ratio of not less than 1:1 for habitat lost. The property acquisition shall include the presence of at least one animal or plant per animal or plant lost at the development site to compensate for the loss of individual sensitive species.

b. An endowment, to be determined at the time the impact is proposed, shall be provided by the project proponent and this endowment shall be adequate to fund ongoing management requirements for the property purchased.

c. The final mitigation may differ from the above values based on negotiations between the project proponent and USFWS and CDFG for any incidental take permits for listed species. The project proponent shall retain a copy of the incidental take permit as verification that the mitigation of significant biological resource impacts at a project site with sensitive biological resources has been accomplished.

4.3-12 ***Where future project-related impacts will impact undeveloped land, site selection shall place primary emphasis on the preservation of large, unbroken blocks of natural open space and wildlife habitat area, and protect the integrity of habitat linkages. As part of this emphasis, IWA shall cluster of development to decrease habitat fragmentation, where relevant. Further, whenever feasible, IWA shall avoid impacts and disturbances to individuals and species considered sensitive by jurisdictional agencies.***

4.3-13 ***Require facility designs to be planned to protect habitat values and to preserve significant, viable habitat areas and habitat connection in their natural conditions.***

a. Within designated habitat areas of rare, threatened or endangered species, prohibit disturbance of protected biotic resources.

b. Within riparian areas and wetlands subject to state or federal regulations, riparian woodlands and habitat linkages require that the vegetative resources which contribute to habitat carrying capacity (vegetative diversity, faunal

resting sites, foraging areas, and food sources) are preserved in place or replaced so as not to result in an measurable reduction in the reproductive capacity of sensitive biotic resources.

c. Within habitats of plants listed by the CNDDB or CNPS as "special" or "of concern," require that new facilities not result in a reduction in the number of these plants, if they are present.

With implementation of the above mandatory and contingency mitigation measures, all potential adverse impacts to biological resources can be reduced to a less than significant impact level.

4.3.6 Cumulative Impacts

Based on field studies, a direct impact on riparian/wetland habitat is forecast to occur. However, contingency measures have been identified to reduce any loss of riparian/wetland habitat associated with the Coachella Valley Stormwater Channel to a less than significant level. Thus, any impact to the Coachella Valley Stormwater Channel habitat resources cannot result in a cumulatively considerable impact to the individual species or to the regional habitat supporting these species. Cumulative biological resource impacts occur when such resources are not avoided, protected or mitigated as outlined above. Based on the mitigation requirements outlined to ensure that biological resources are avoided or otherwise protected or mitigated, no cumulative significant adverse biological resource impacts are forecast to occur if the IWA Recycled Water Project is implemented as analyzed in this section except with respect to the constructed wetland ponds. The loss or significant reduction in size of the constructed wetland ponds would be a significant adverse impact of the project that would result in the loss or diminished ability of the site to serve as resting and foraging stop for migrating waterfowl or as nesting or wintering habitat. Therefore, its loss has no potential to contribute to a cumulatively considerable loss of sensitive habitat.

4.3.7 Unavoidable and Adverse Impacts

The biological resource evaluation presented above indicates that, with implementation of appropriate mitigation measures, the IWA Recycled Water Project will not cause any significant unavoidable adverse biological resource or land use/planning conflict impact other than the reduction in area of the constructed wetland treatment ponds. Mitigation has been incorporated that would reduce all potential adverse biological impacts of the proposed project to a less than significant impact level except for with respect to the constructed wetland treatment ponds. The loss or significant reduction in size of the constructed wetland ponds would be a significant adverse impact of the project that would result in the loss or diminished ability of the site to serve as a resting and foraging stop for migrating waterfowl or as nesting or wintering habitat. Therefore, its loss has a potential to contribute to an unavoidable and adverse impact on sensitive habitat. Mitigation can offset loss of up to one-half acre of the constructed wetland ponds, but beyond this amount the impact is concluded to be an unavoidably significant adverse impact that cannot be mitigated.

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FIGURE 4.3-1a
Western Portion of the Study Area

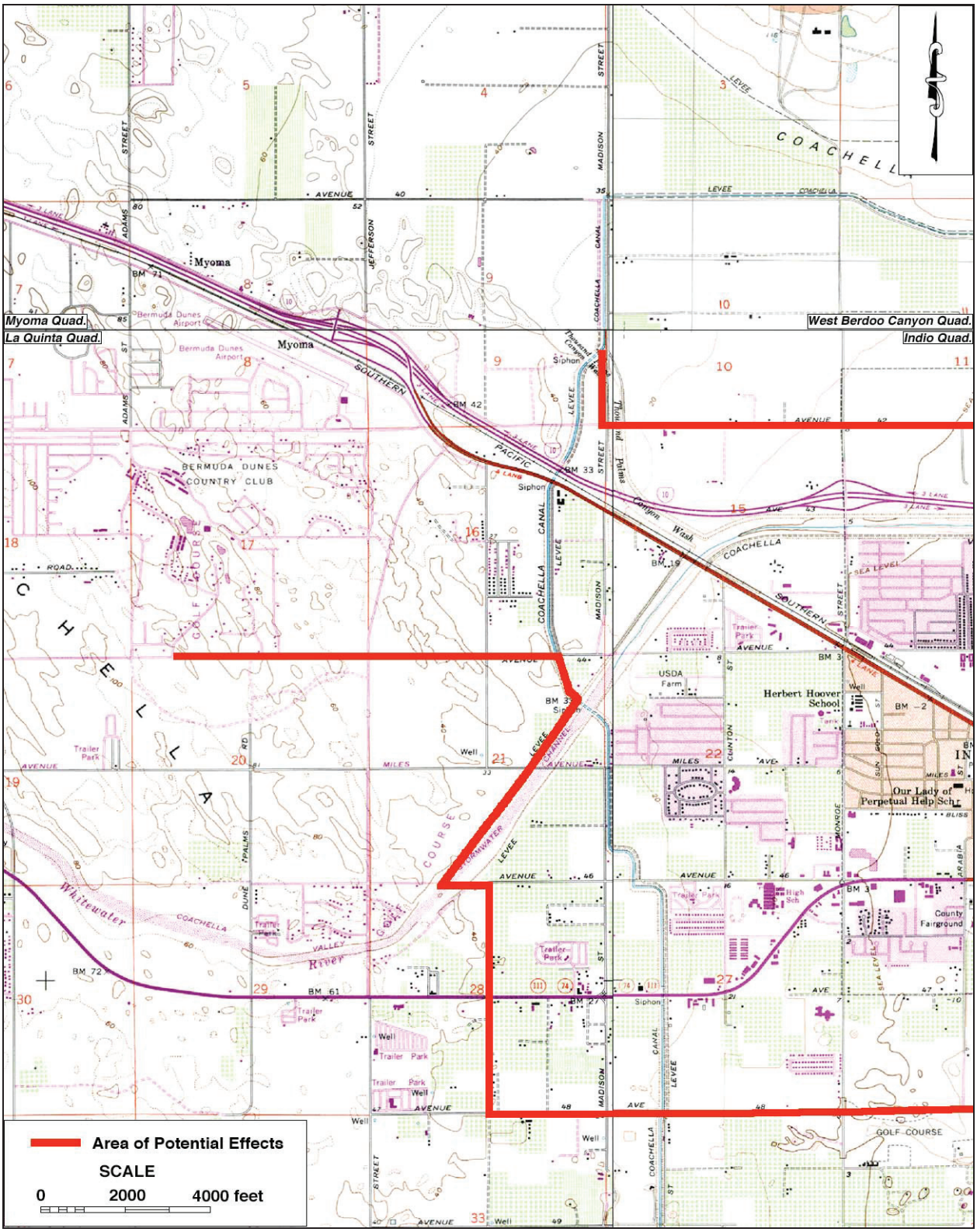


FIGURE 4.3-1b
Eastern Portion of the Study Area

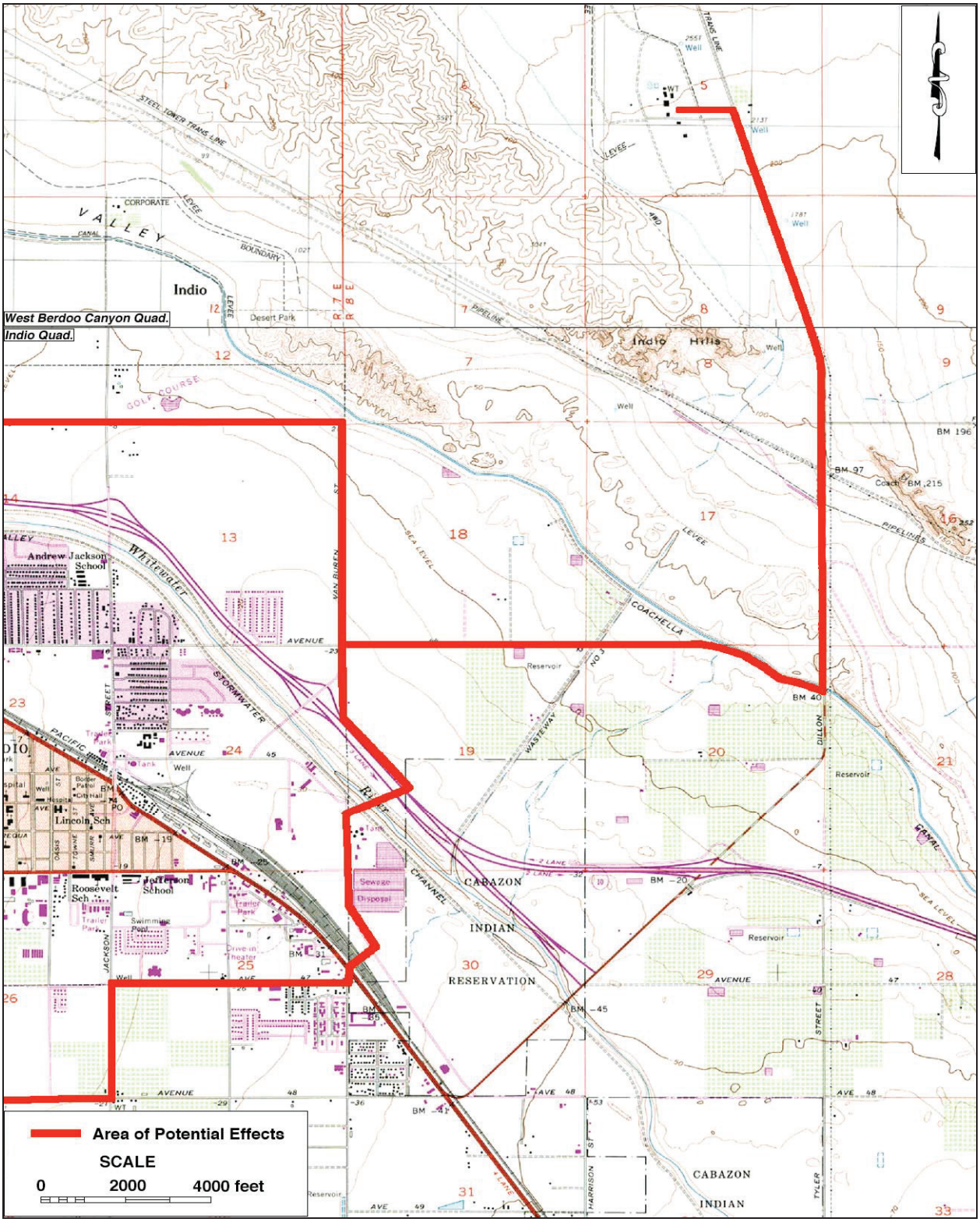
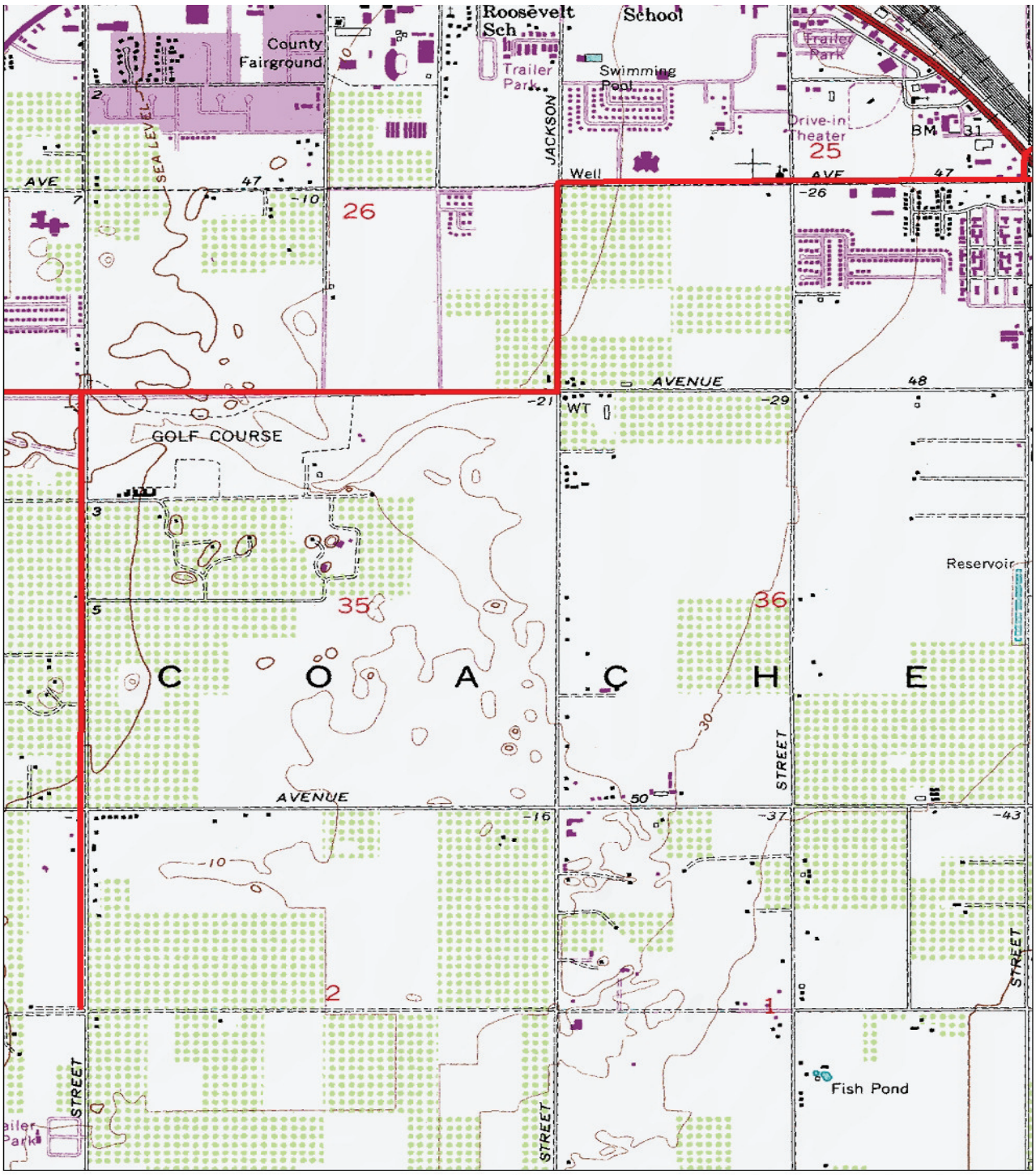


FIGURE 4.3-1c
South Part of Eastern Portion of Study Area



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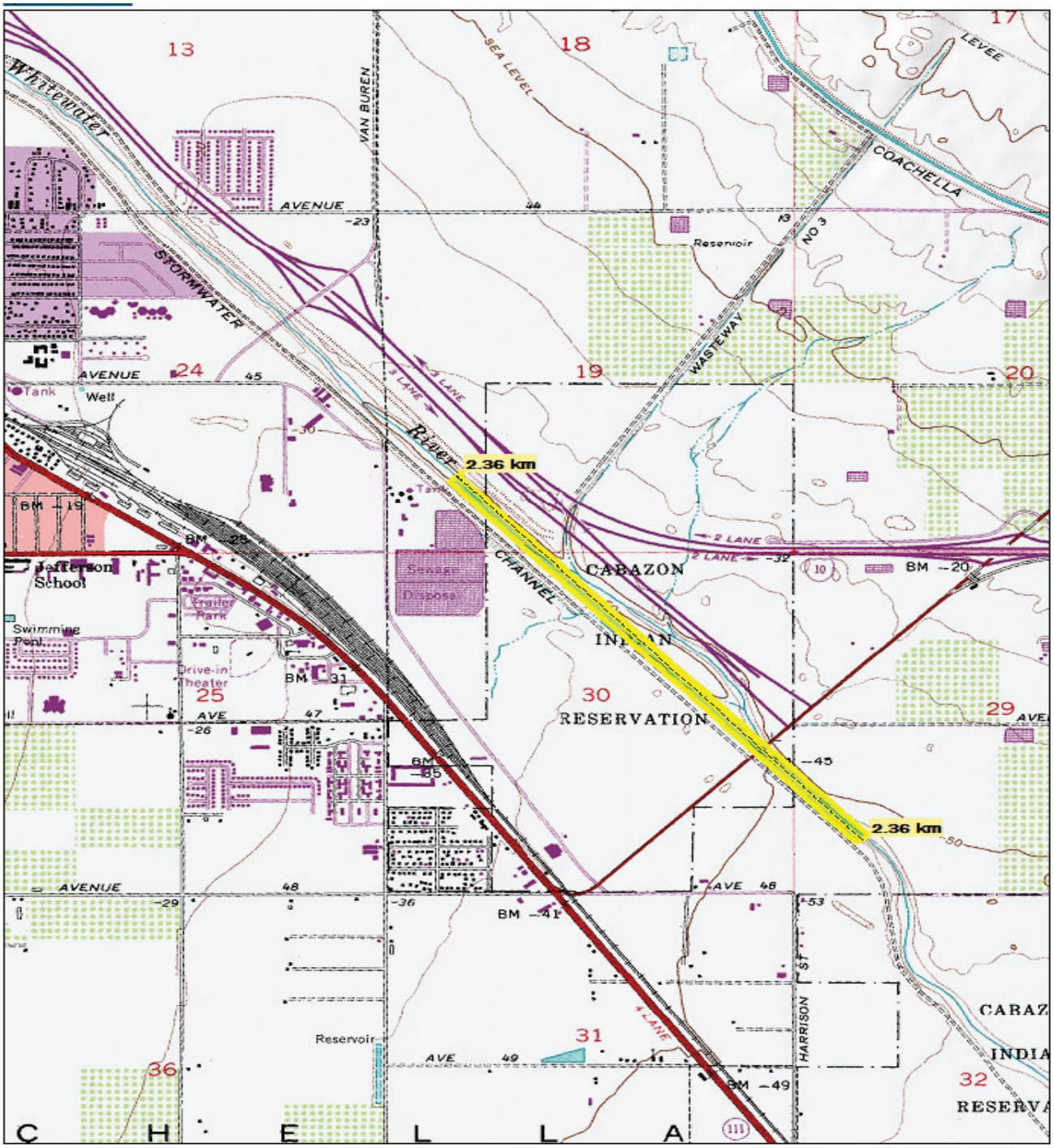
MN (12.2° E)

0 180 360 540 720 900 m

Data Zoom 13-4

FIGURE 4.3-2
LBVI and SWWF Survey Area in the Channel & Location of Burrowing Owl



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MN (12.2° E)

0 500 1000 m

Data Zoom 12-6

FIGURE 4.3-3
Habitat Map for the Channel and Pond Survey Areas

4.4 CULTURAL RESOURCES

4.4.1 Introduction

Cultural resources are the physical remains of past human activities that are addressed in the CEQA process in a manner similar to natural resources. The term "cultural resources" encompasses archaeological resources of historic and prehistoric origin. Such resources include artifacts, refuse, and features in both surface and subsurface contexts, that are greater than 50 years in age and/or meet other established criteria to qualify as historic in nature. Prehistoric resources differ from historic resources in that they date from before written records were kept by a culture. Prehistoric and historic resources may occur together on the same site. Paleontological resources, the fossil remains or traces of past life forms, are also addressed in this section because both archaeological and paleontological resources can be exposed during grading, trenching or other ground disturbing activities. A brief explanation of each type of resource follows.

1. Prehistoric archaeological resources in California typically include the remains of villages and campsites, food processing locations, lithic (stone) resource procurement and tool-making locations, and burial and cremation areas. They may also consist of trails, rock art and geoglyphs (ground figures) and isolated artifacts. Prehistoric archaeological resources are the result of activities of the ancestors and predecessors of contemporary Native Americans who occupied the area of potential effect (APE) prior to European recordation of history for the area. In many cases, these resources retain special traditional and sacred significance for contemporary Native Americans.

2. Historic archaeological resources include refuse deposits such as can and bottle dumps, filled-in privy pits and cisterns, melted adobe walls and foundations, collapsed structures and associated features, and roads and trails. They may relate to mission activities, travel and exploration, early settlement, homestead activities, cattle and sheep herding, lumbering, and mining, among other themes. In southern California, historical archeological resources date from the earliest Spanish Mission activities (ca. 1770) when the first Europeans arrived and began to record historical activities in the project area.

   Historic resources are intact structures of any type that are 50 years or more of age. These resources are sometimes called the "built environment" and include houses or other structures, irrigation works, and engineering features, among other items.

3. Paleontological resources are the fossil remains or traces of past life forms, including both vertebrate and invertebrate species, as well as plants. These resources are found in geologic strata conducive to their preservation, typically sedimentary formations. All vertebrate fossils are considered to be significant because they provide information about past environments that occurred at the project location. Other kinds of paleontological resources must be evaluated individually for significance depending on their potential scientific value.

Known cultural resources are those which have been identified through formal recognition on one or more of the following inventories: National Register of Historic Places, California Archaeological Inventory, California Historic Resources Inventory, California Historical Landmarks, Points of Historic Interest and others.

No substantive comments were received at the scoping meeting held for this proposed project that focused on cultural resource impacts. Several comments on cultural resource issues were submitted in response to the Notice of Preparation. The California Native American Heritage Commission (NAHC) recommended consultation with area tribes (a list of Native American contacts was provided), use of Native American monitors where appropriate and consultation with the Office of Historic Preservation. The NAHC provided guidelines for identifying and preserving cultural resources if encountered. In addition NAHC stated that Lead Agencies should consider avoidance of significant cultural resources and provided Code sections regarding the requirements for handling accidental discovery of any human remains. Information is provided in this section to address the general concerns expressed regarding cultural resource impacts. Refer to the summary list of comments in Chapter 2 and also to copies of the comment letters themselves in Appendix 8.2 of this Volume of the Draft EIR. The cultural resources report prepared for the project by CRM Tech, which details the correspondence initiated by the firm with Native American Tribes, is provided in the Technical Appendices. CRM TECH contacted a total of 19 Native American representatives in the region both in writing and by telephone between June 11 and August 19, 2010 to solicit local Native American input regarding any possible cultural resources concerns over the proposed undertaking. For detailed information regarding the correspondence, please refer to the Technical Appendices.

The purpose of this DEIR is to provide the necessary information and analysis to determine whether the proposed project would have any adverse effects on archaeological resources, as defined by the National Historic Preservation Act (NHPA) Section 106 and CEQA, that may exist within the project “area of potential effect” (APE), or on paleontological resources; collectively termed “cultural resources” in this document. The following analysis relies upon the CRM TECH cultural resources evaluation for the project dated November 10, 2010 and the Addendum to the Report dated March 16, 2011 (Appendices 3a and 3b in Volume 2, Technical Appendices).

4.4.2 Environmental Setting

4.4.2.1 Prehistoric Period

The Coachella Valley, in which the project is proposed, was occupied by villages of Takic-speaking Cahuilla Indians (estimates suggest between 3,600 and 10,000 individuals pre-European contact) through about the middle of the 19th century. Indigenous populations were decimated by European diseases during the 19th century. Today, Indians with Cahuilla heritage are mostly affiliated with one or more of the Indian reservations in and near the Coachella Valley, including Cabazon, Torres Martinez, Augustine, Agua Caliente, and Morongo. (CRM Tech, 2010)

4.4.2.2 Historic Period

The Coachella Valley was largely avoided by non-Indians during the Mexican and early American periods, with the exception of those traveling along established trails. In 1823-1825, José Romero, José Maria Estudillo, and Romualdo Pacheco led a series of expeditions in search of a route to Yuma, becoming the first noted European explorers to travel through the Coachella Valley. The Cocomaricopa Trail, also known as the Bradshaw Trail, was an ancient Indian trading route that was "discovered" in 1862 by William David Bradshaw and became an important wagon road between coastal southern California and the Colorado River, until it was

overshadowed by the completion of the Southern Pacific Railroad in 1876-1877. The Trail traversed a similar course to that of present-day Highway 111. Non-Indian settlement in the Coachella Valley began with the establishment of railroad stations, including the origin of modern-day Indio, and accelerated in the 1880s after public land was opened for claims under federal land laws including the Homestead Act and the Desert Land Act. Development of underground water sources allowed farming, particularly of date palms during the early 1900s, to become the dominant economic activity in the valley. In the 1920s, the precursors to the modern economic model of the valley based on country clubs and resorts were established. (CRM Tech, 2010)

4.4.2.3 Paleontologic Resources

According to Riverside County General Plan Figure OS-8, the Paleontological Sensitivity Resources map, portions of the project area of impact are located within lands with a high probability to yield paleontological resources. According to the City of Indio Figure 4.8-12 Sensitive Paleontological Resources map, the majority of the City has a high potential for paleontological resources, with the exception of the western edge of the City.

4.4.3 Environmental Impacts

4.4.3.1 Thresholds of Significance

The purpose of this analysis is to identify any cultural resources within or adjacent to the project area, and to assist the IWA in determining whether such resources meet the official definitions of “historic resources,” as provided in the California Public Resources Code or would otherwise be considered significant resources.

According to PRC §5020.1(j), “historical resource’ includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.” Specifically, CEQA guidelines state that the term “historical resources” applies to any such resources listed in or determined to be eligible for listing the California Register of Historical Resources, included in the local register of historical resources, or determined to be historically significant by the Lead Agency (Title 14 CCR §15064.5(a) (1-3)).

Regarding the proper criteria for the evaluation of historical significance, CEQA guidelines mandate that “a resource shall be considered by the lead agency to be ‘historically significant’ if the resource meets the criteria for listing on the California Register of Historical Resources” (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

A significant cultural resource impact would be any one impact that resulted in the damage, disturbance or destruction of an archeological, paleontological, or other historic/cultural resource.

4.4.3.2 Project Impacts

Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

The CRM Tech Identification and Evaluation of Historical Properties Report dated November 10, 2010 evaluated the historical significance of resources within the project areas. Because the proposed satellite treatment facility locations were not considered in the initial evaluation, an Addendum to the Report was prepared evaluating the possible future satellite locations, dated March 16, 2011. The evaluation included a search of available historical records through the Eastern Information Center (EIC), located at the University of California, Riverside and review of historical maps, photos and literature. CRM TECH archaeologist Daniel Ballester surveyed the proposed area of impact on June 10 and November 9, 2010 and on January 31 and February 1, 2011. Most of the land that would be impacted by the project was found to be highly disturbed, with much of the area located within paved roads and parking lots. Areas of the proposed project impacts would occur where native soil is visible include the Whitewater River channel, vacant parcels on Avenue 42 and Landmark Golf Parkway, at the proposed tertiary filtration system sites and at the proposed satellite treatment facility locations. The CRM Tech technical study and addendum is provided in Volume 2, Technical Appendices for review by the public.

According to the EIC, a large portion of the proposed IWA Recycled Water Project facilities were evaluated for historical resources in approximately 20 previous cultural resources studies; however, the project area in its entirety had not been previously surveyed. The westernmost portion of the proposed project area of impact lies across one of the densest concentrations of prehistoric archaeological sites to be found in Riverside County, a direct reflection of the location of that area along the former shoreline of Holocene Lake Cahuilla and along the Whitewater River. A total of 335 historical/archaeological sites, historic-period buildings and isolates were previously identified within a one mile radius of the project area. Of these, more than 150 of the sites were prehistoric, recorded predominantly as multi-use sites with associated artifacts such ceramic sherds, lithic flakes, fire-affected rock, and groundstone implements, while the remaining sites and isolates dated to the historic period. The historic-period sites in the vicinity consisted primarily of refuse deposits, while the historic-period buildings were mostly residences constructed in the early and mid-20th century. The vast majority of recorded sites have been removed after proper archaeological treatment, including subsurface testing and mitigative excavations.

The Historic Properties Report found that twenty-one of the previously recorded cultural resources were located partially within, adjacent to, or in close proximity to the project area of impact. Summary information regarding these resources is listed in Table 4.4-1. Of the 18 cultural resources recorded adjacent or in close proximity to the APE, 15 dated to the prehistoric period, including habitation sites and ceramic scatters, and the other three dated to the historic period, including an agricultural complex and a 1960s farm labor center. As stated previously, most of the cultural resource sites within the scope of the records search have been

removed since they were recorded. None of the 18 cultural resources are or were found to be located immediately adjacent to the boundaries of the project area of impact as evaluated in the original Report. (The satellite treatment facility locations addressed in the addendum to the report will be addressed in a subsequent paragraph.) For example, the Fred Young Farm Labor Center is located on a parcel that is adjacent to the roadways in which a pipeline is proposed. Such resources, if present today, would have no potential to be affected by the trenching operations proposed for the placement of pipeline facilities.

Table 4.4-1
PREVIOUSLY RECORDED CULTURAL RESOURCES WITHIN OR ADJACENT TO THE APE

Site No.	Recorded by / Date	Description
33-000159	Various 1960-1993	Prehistoric habitation site; destroyed by construction
33-001540	Townsend 1976	Prehistoric camp site with ceramic and bone
33-001769	Desautels 1982	Small prehistoric ceramic scatter
33-005330	Love and Moffit 1994	Large prehistoric ceramic scatter
33-005331	Love and Moffit 1994	Prehistoric ceramic sherds, lithics, and groundstone
33-005354	Love and Moffit 1994	Historic-period agricultural complex
33-005705*	Foulkes 1983	Coachella Canal
33-007425	Collins 1995	Prehistoric habitation site with historic-period refuse
33-008142	Love 1997	Prehistoric ceramic and lithic scatter; removed
33-008144	Love 1997	Prehistoric ceramic scatter; removed
33-008729	Alexandrowicz and Krautkramer 1999	Prehistoric habitation site
33-008741	Alexandrowicz and Krautkramer 1999	Prehistoric lithic and ceramic scatter
33-009498*	Ashkar 1999; Taniguchi 2005	Former Southern Pacific (now Union Pacific) Railroad
33-010993	Harm 2000	Concrete wall
33-011114	Ballester 2001	Prehistoric ceramic and lithic scatter with fire-affected rock and groundstone artifacts
33-011116	Ballester 2001	Prehistoric ceramic scatter with fire-affected rock
33-011414	Ballester 202	Prehistoric ceramic scatter with one lithic flake
33-012298	Smith et al. 1999	Prehistoric ceramic scatter with fire-affected rock and bone awl tip
33-013528	O'Neil and Brown 2004	Bedrock milling feature
33-017259*	Ballester 2008	Coachella Valley Stormwater Channel
33-017933	Jacquemain and Ballester 2009	Fred Young Farm Labor Center, ca. 1966

Note: * Recorded partially within the APE

The three sites located partially within the APE were linear features from the historic period: the Coachella Canal, the former Southern Pacific (now Union Pacific) Railroad, and the Coachella Valley Stormwater Channel.

During a study completed in 2005, **the Coachella Canal** (Site 33-005705) was determined to be eligible for listing in the National Register of Historic Places because of its close association with "the enormous public works effort arising from the Boulder Canyon Act" and as an example of the "state-of-the-art construction methods and innovative approaches to working in extreme desert temperatures" (Schaefer et al. 2003:5.5-5.6 as quoted in CRM Tech 2010). Since all properties found eligible for the National Register are automatically considered eligible for the California Register, Site 33-005705 clearly meets the definitions of a "historic property" under Section 106 and a "historical resource" under the CEQA.

Under current regulatory guidelines, however, in most cases cultural resources studies for linear infrastructure projects that simply cross irrigation canals may exclude them from the APE because there is generally little potential for their historical characteristics and significance to be

affected (JRP and Caltrans 2000:1 as quoted in CRM Tech 2010). There are two locations where the proposed project would cross the Coachella Canal at nearly perpendicular angles. In light of the minimal potential for the proposed project to affect the overall characteristics and physical attributes of the Coachella Canal, it was determined that the above referenced provision applies. Therefore, the proposed project would have no significant adverse affect on the Coachella Canal and requires no further consideration.

The former Southern Pacific Railroad (Site 33-009498) once played a crucial role in the development of the region and state, and demonstrates the basic potential to meet Criterion A for the National Register and/or Criterion 1 for the California Register. However, this railway is a working element of modern transportation infrastructure (Union Pacific Railroad system), which has been repeatedly replaced and upgraded over the years, resulting in a rail line that is characterized by physical components that are mostly modern in age and in appearance. Therefore, due to the lack of remaining historic integrity, the former Southern Pacific Railroad does not appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources, and does not constitute a "historic property" or a "historical resource." Impacts to this feature will not result in a significant adverse affect on a “historic property or resource.”

The Coachella Valley Stormwater Channel (Site 33-017259) was determined to be ineligible for the California Register of Historical Resources during a 2008 study (Tang and Quinn 2008:5 as quoted in CRM Tech 2010). That study found that while the channel played a historically significant role in the development of the region through the supply and distribution of water, similar in nature to that of the Coachella Canal, the Stormwater Channel was the result of limited human alterations to the existing Whitewater River channel and is not an example of notable design or engineering. Like the former Southern Pacific Railroad, the Stormwater Channel is a component of working infrastructure, which has been continually updated and does not retain features historic in appearance.

Therefore, based upon the lack of any specifically historical characteristics and the questionable historic integrity as well as the undistinguished design and construction, it was determined that the channel retains little data potential for the study of regional history or the history of engineering. It was concluded therefore that the Stormwater Channel does not appear eligible for listing in the National Register of Historic Places and does not qualify as a "historic property" or a "historical resource." Impacts to this feature will not result in a significant adverse affect on a “historic property or resource.”

The satellite treatment facility locations, with the exception of the western portion of Posse Park, were not evaluated in the original historical evaluation and were addressed in the Addendum to the Report dated March 16, 2011. Please refer to Figures 4.4-1a and 4.4-1b for the area covered in the original report evaluation and to Figure 4.4-2 for the area covered in the Addendum. The sites adjacent to the Indio Municipal Golf Course were surveyed in 1998 and archaeological test excavations were conducted in 2002. Historic resources found on the sites included pottery sherds, pieces of lithic debitage, rocks and fire-affected rocks, cores, hammerstones, pieces of groundstone, pestles, projectile points and a possible human cremation. The resources were determined to qualify as “historical resources” according to CEQA guidelines.

Mitigative data recovery excavations were conducted on the sites adjacent to the Indio Municipal Golf Course in 2003, in which all surface resources were collected and numerous shovel test pits and excavations were conducted, resources were analyzed and important data was preserved. However, it is typical for artifacts to remain undiscovered at a site despite the surface recovery and pit testing, and particularly likely given the windblown sand habitat in which the site is located. During the field survey conducted in 2011 as part of the Addendum to the original report for this project, no cultural resources of historic nature were found at the Posse Park site; however, multiple artifacts were found at the site adjacent to Indio Municipal Golf Course where previous resources are recorded from. Historic artifacts observed in 2011 included ceramic potsherds, a groundstone fragment, lithic flakes and fire-affected rocks. Some of the artifacts were located within the boundaries of the previously documented historic resource "site", but others were found in a location that would extend the boundaries of one of the historic resource sites further to the west. Although data recovery excavations and archaeological monitoring have been conducted on the sites at and in the vicinity of the possible satellite facility locations, additional cultural resources are present and there is a high potential for buried cultural deposits, including the possibility of human cremations. As such, an archaeological monitoring program detailed in the mitigation measures below will be required for any earth-moving activities that will occur on the satellite treatment facility sites as shown on Figure 4.4-2.

Based on the findings and analysis of potential effects from implementing the proposed project, no adverse historical resource impacts are forecast to result from implementing the IWA Recycled Water Project with implementation of the proposed archaeological monitoring program at the possible satellite treatment facility locations. Although no mitigation is required to address potential for any known significant historical resources at other locations within the project area of impact, contingency mitigation measures are provided below to address the exposure of unknown subsurface resources from installation of the proposed facilities, particularly pipelines which may be trenched below previous disturbances along roadway alignments.

Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

The CRM Tech *Identification and Evaluation of Historical Properties* Report dated November 10, 2010 and Addendum to the Report dated March 16, 2011 evaluated the historical significance of resources within the project areas. The westernmost portion of the proposed project area of impact lies across one of the densest concentrations of prehistoric archaeological sites to be found in Riverside County, a direct reflection of the location of that area along the former shoreline of Holocene Lake Cahuilla and along the Whitewater River. More than 150 archaeological sites and isolates, predominantly multi-use sites with associated artifacts such ceramic sherds, lithic flakes, fire-affected rock, and groundstone implements, were previously identified within a one mile radius of the project area. The vast majority of recorded sites have been removed after proper archaeological treatment, including subsurface testing and mitigative excavations.

The majority of proposed project impacts would occur within already disturbed road rights-of-way, parking lots and wastewater infrastructure compounds. Due to the already disturbed nature of these locations, construction of these facilities is not forecast to result in significant impacts to archaeological resources. Portions of the proposed project that would be located outside of highly disturbed areas were systematically surveyed by a qualified archaeologist, and

no archaeological resources were identified with the exception of the resources encountered at the proposed satellite treatment facility site located adjacent to the Indio Municipal Golf Course.

Based upon the disturbed nature of the proposed project facilities locations, the historic resources report determined that the construction of the IWA Recycled Water Project would not result in significant impacts to archaeological resources. The Addendum to the Report determined that impacts the proposed satellite treatment facility locations would require implementing an archaeological monitoring program during any earth-moving activities that may occur on the satellite treatment facility sites as shown on Figure 4.4-2. Mitigation is also recommended in the event that buried cultural materials are encountered during construction activities at other locations along the area of potential effect.

Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

As previously stated, both the Riverside County General Plan and the City of Indio General Plan identify most of the project area of impact as within lands with a high probability to yield paleontological resources. The historical resources analysis found that the vast majority of project impacts would occur within highly disturbed land areas where native soils have been covered with pavement and structures. However, the project will involve trenching that may expose soils below the depth of previous development. Therefore, there is a potential for encountering paleontological resources, and mitigation measures are provided that will require monitoring, collection and curation of paleontological resources.

Would the project disturb any human remains, including those interred outside of formal cemeteries?

The project, particularly the western portion of the project, is located in an area with very high density of recorded cultural remains. There is a potential for encountering previously undocumented human remains. The mitigation measures outlined below will ensure that any human remains exposed will be treated with dignity and propriety.

4.4.4 Mitigation Measures

Based on the findings and analysis presented above, the following mitigation measures will be implemented prior to and during project construction.

4.4-1 ***If unknown buried cultural resources are discovered during project construction, all work in the area of the find shall cease, and a qualified archaeologist shall be retained by the project sponsor to investigate the find, and to make recommendations on its disposition. A professional report detailing findings shall be prepared and retained under IWA direction. The IWA shall implement the archaeologist's recommendations as long as the cost does not exceed professional norms.***

4.4-2 ***IWA shall arrange to have a professional archaeologist monitor all trenching, excavation and other earth-moving activities at the satellite treatment facility sites shown on Figure 4.4-2. If archaeological resources are discovered, excavation activities in the area of the find shall be halted until the qualified archaeologist can evaluate the nature and significance of the finds. The archaeologist will be able to assess the resource, determine its significance, and make recommendations for appropriate mitigation measures within the guidelines of the California Environmental Quality Act, if necessary. The IWA and/or contractor shall implement the management recommendations of the archaeologist for any resource exposed during construction activities. The***

archaeologist shall ensure proper and timely evaluation and treatment of any cultural resource materials unearthed in this area. If any cultural resources are encountered during construction monitoring, a professional report detailing findings shall be prepared and retained under IWA direction.

4.4-3 When excavations extend below ten feet or encounter older alluvial sediments, the contractor shall have a qualified paleontologist conduct a review of the sediments and determine whether monitoring during additional initial ground disturbance is required during continuing excavation activities. Monitoring may be periodic or continuous during excavation activities in sensitive paleontological areas. If paleontological resources are discovered, excavation activities in the area of the find shall be halted until the qualified paleontologist can evaluate the nature and significance of the finds. The paleontologist will be able to assess the resource, determine its significance, and make recommendations for appropriate mitigation measures within the guidelines of the California Environmental Quality Act, if necessary. The IWA and/or contractor shall implement the management recommendations of the paleontologist for any resource exposed during construction activities. A professional report detailing findings shall be prepared and retained under IWA direction.

4.4-4 If human remains are encountered during construction, all work shall cease pursuant to procedures set forth in Section 7050.5 of the State Health and Safety Code and no further disturbance shall occur until the county coroner has made a determination of origin and disposition pursuant to State Public Resources Code Section 5097.98. If the coroner determines that the burial is prehistoric, the Native American Heritage Commission must be contacted and appropriate disposition of the human remains determined. The IWA shall be notified and actions to manage the remains shall be documented in a report to the IWA.

4.4-5 The proposed well sites and the RO brine treatment facilities have not yet been assigned a specific location, only a general location. Therefore, prior to final site selection for these facilities, a site specific cultural resources survey shall be conducted. If archaeological resources are discovered during these surveys, excavation activities in the area of the find shall not be initiated until the qualified archaeologist can evaluate the nature and significance of the finds. The archaeologist will be able to assess the resource, determine its significance, and make recommendations for appropriate mitigation measures within the guidelines of the California Environmental Quality Act, if necessary. The IWA and/or contractor shall implement the management recommendations of the archaeologist for any resource identified as a result of the surveys.

With implementation of the above mandatory and contingency mitigation measures, all potential adverse impacts to cultural and paleontological resources can be reduced to a less than significant impact level.

4.4.5 Cumulative Impacts

Mitigation measures have been identified that will be implemented to control potential cultural and paleontological resource impacts for the proposed project to a less than significant impact. Based on these measures, the proposed project is not forecast to cause or contribute to cumulatively considerable impacts to cultural and paleontological resources in the project area.

4.4.6 Unavoidable Adverse Impacts

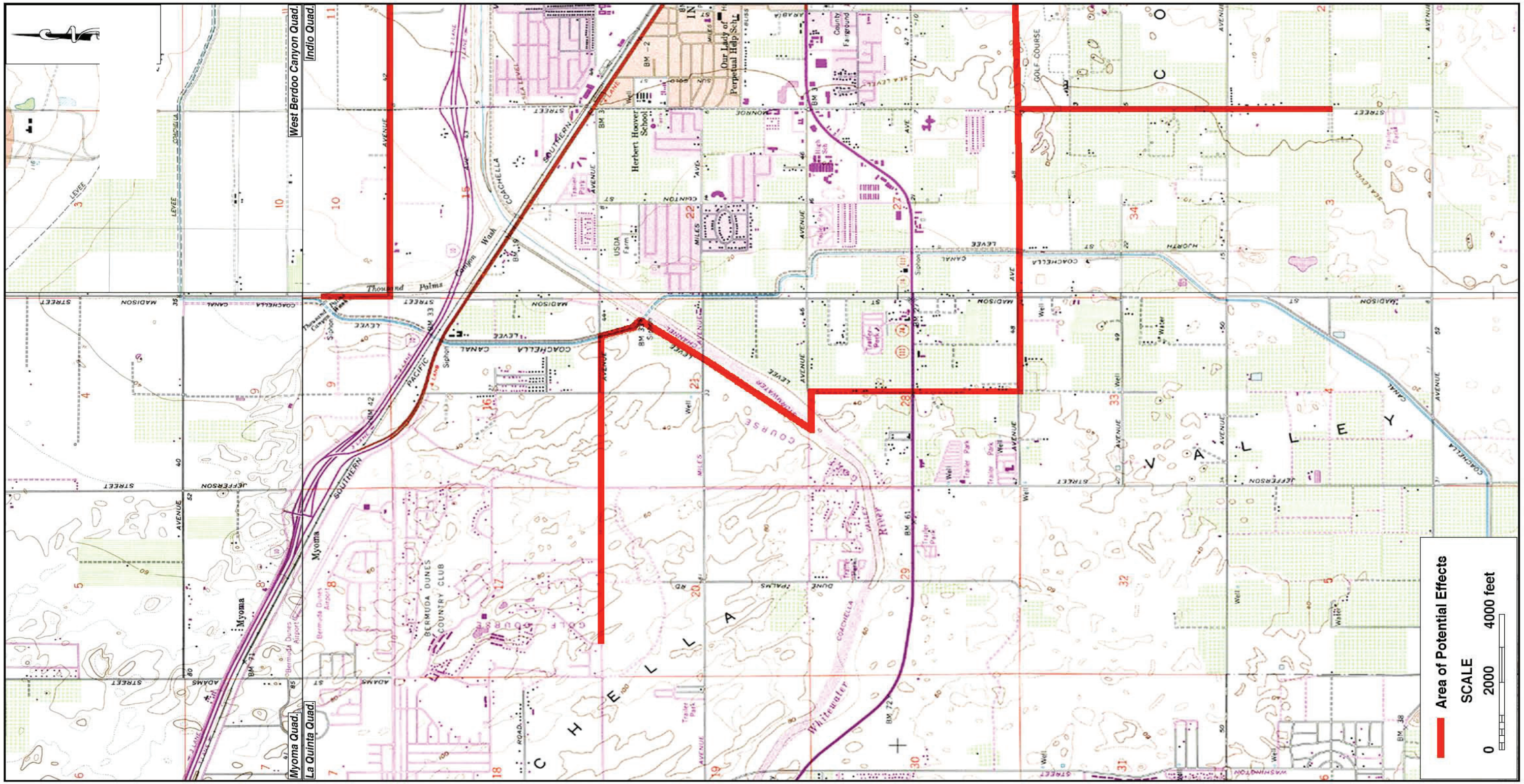
The construction to be carried out for the proposed project will disturb surface areas and subsurface areas within the Cities of Indio and La Quinta and in unincorporated portions of Riverside County. The construction to be carried out for the proposed project would disturb

surface and subsurface areas within the Cities of Indio and La Quinta and in unincorporated portions of Riverside County. The westernmost portion of the proposed project area of impact lies across one of the densest concentrations of prehistoric archaeological sites to be found in Riverside County.

The vast majority of project impacts would occur within highly disturbed land areas where native soils have been covered with pavement and structures. However, the project will involve trenching that may expose soils below the depth of previous development even in developed areas. Impacts to the previously recorded Coachella Canal, Southern Pacific Railway and Coachella Valley Stormwater Channel were determined to be less than significant in accordance with regulatory guidelines based upon the minimal impacts to the resource (crossings of a linear feature) that would occur or the lack of historical integrity for the infrastructure to qualify as a historical resource. Several of the proposed satellite treatment facility locations are within the boundaries of known cultural sites and historic resources were found during survey of these sites.

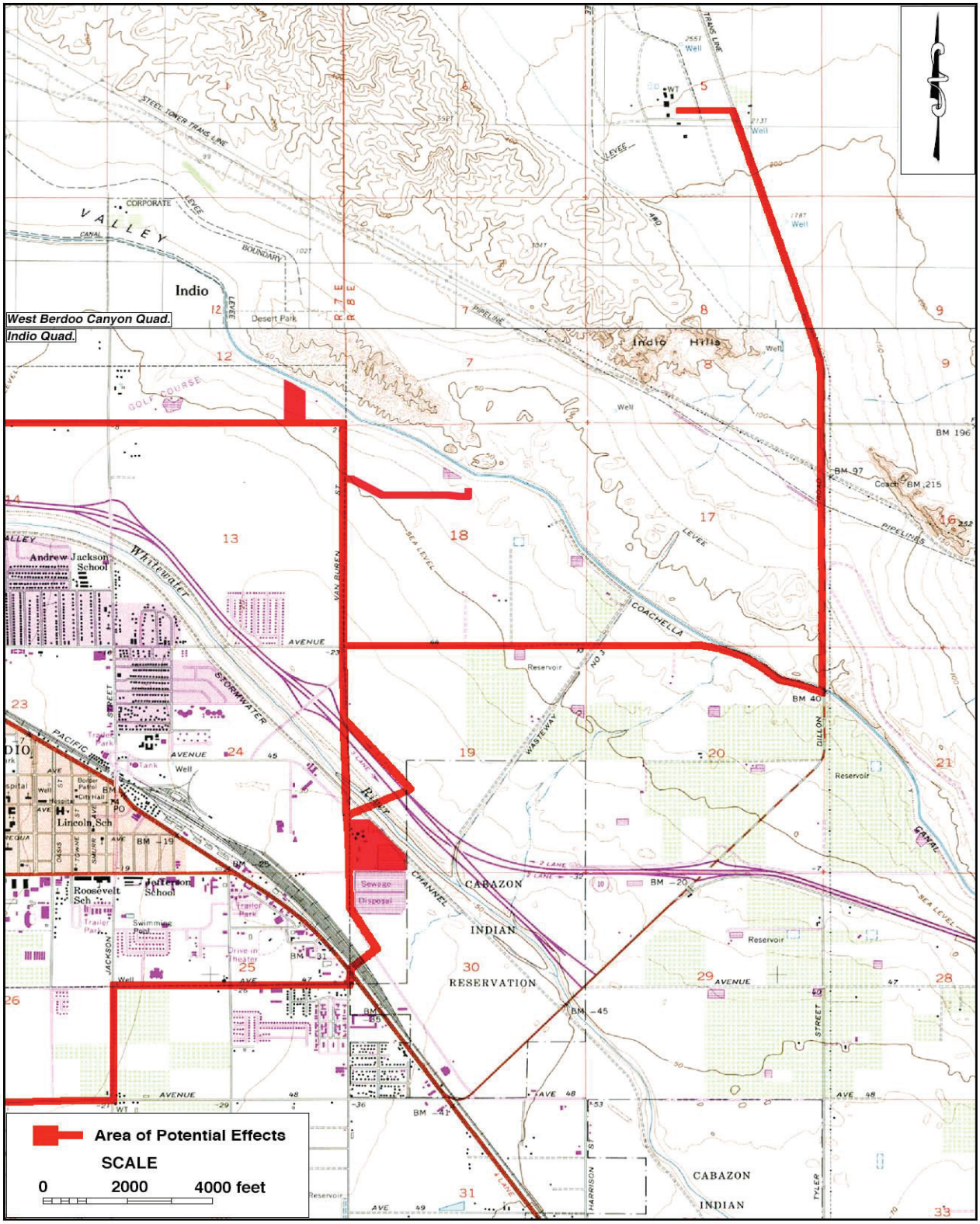
Testing and data recovery programs conducted as part of an archaeological monitoring program during earth-moving at the satellite treatment facility locations is required to lessen the level of impact to a less than significant level. Contingency measures are provided in the event that cultural resources are discovered at developed locations that do not require construction monitoring. Procedures have been established to require avoidance or recordation of cultural and paleontological resources and retain the knowledge that discovery and recordation of these resources will provide. Implementation of the mitigation measures presented above will serve to reduce potential unavoidable significant effects on cultural and paleontological resources to a less than significant level. No unavoidable significant adverse cultural resource impacts are forecast to result from project implementation.

FIGURE 4.4-1a
Area of Potential Effects, Western Portion



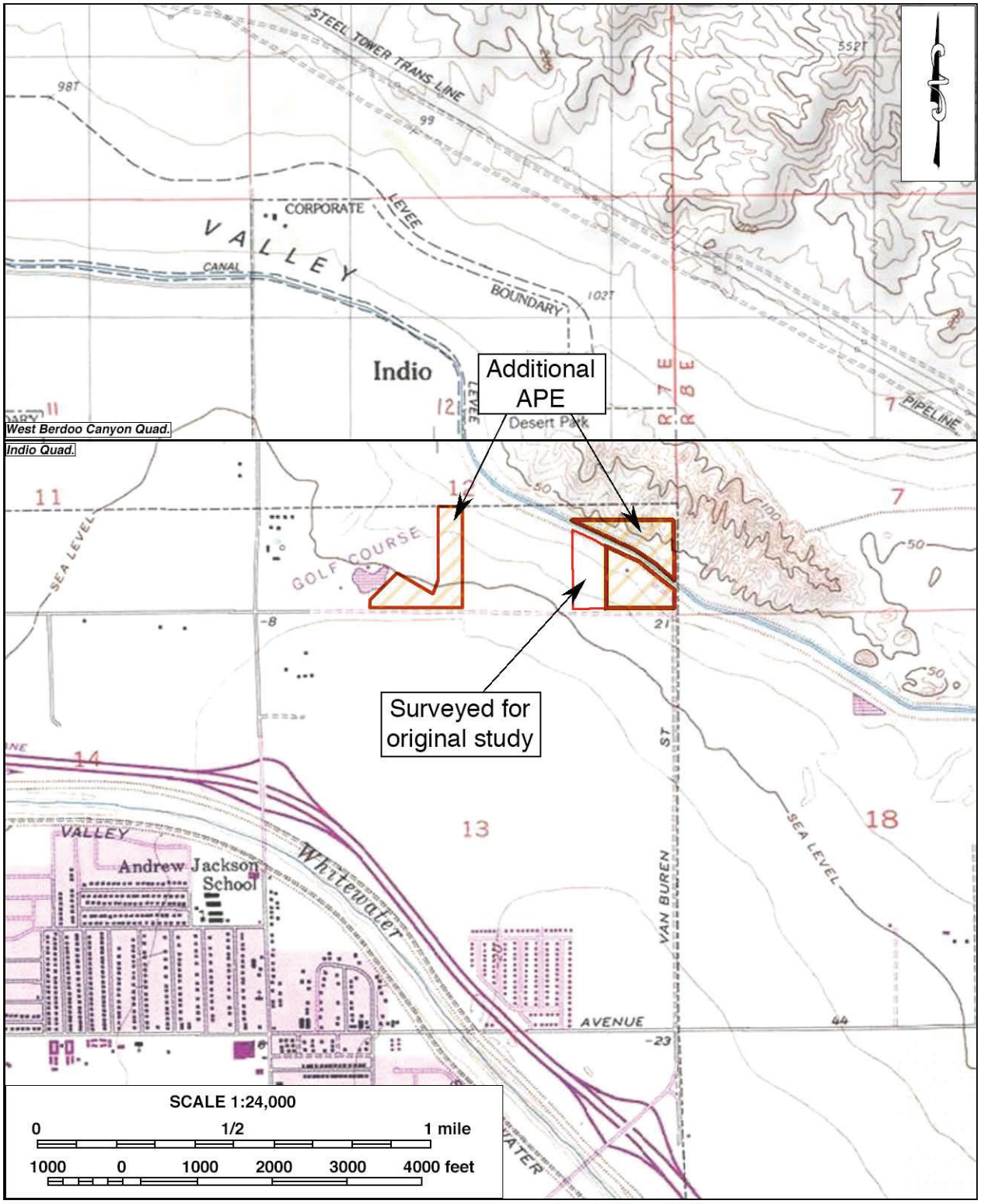
Source: CRM TECH (Based on USGS Indio, Myoma, La Quinta and West Berdoo Canyon, California, 1:24,000 quadrangles)

FIGURE 4.4-1b
Area of Potential Effects, Eastern Portion



Source: CRM TECH (Based on USGS Indio and West Berdoo Canyon, Calif., 1:24,000 quadrangles

FIGURE 4.4-2
Additional Areas of the APE (Covered in Addendum)



Source: CRM TECH (Based on USGS Indio and West Berdoo Canyon, Calif., 1:24,000 quadrangles)

4.5 HYDROLOGY / WATER QUALITY

4.5.1 Introduction

The analysis in this section focuses on potential hydrology and water quality impacts associated with implementing the IWA Recycled Water Project. This section will evaluate the available information about the background hydrology and water quality and forecast the type of impacts that may occur, including identification of mitigation measures that can ensure potential impacts from constructing and operating the IWA Recycled Water Project are minimized to the extent feasible. This Subchapter also addresses the environmental issues in the Utilities/Service Systems section that focus on wastewater treatment facilities and disposal of waste associated with the tertiary treatment facilities and in the Geologic/Soils section that address liquefaction hazards. Refer to Subchapter 8.1, which contains a copy of the Initial Study for the proposed project.

In addition to the standard hydrology and water quality issues that are addressed in this Subchapter of the DEIR, a number of specific issues were raised in two comment letters provided by the California Regional Water Quality Control Board and the California Department of Health. These comment letters are reproduced in Appendix 8.2 of this DEIR and are summarized in detail in Chapter 2 of the DEIR. Specific responses are also provided to the issues raised in these comment letters. The responses are provided in the same manner as the analysis for the other topical evaluations presented below. An abbreviated summary of comments relevant to the hydrology and water quality discussion is provided below.

The comment letter from the California Regional Water Quality Control Board (RWQCB), dated July 16, 2010, states that the EIR should consider potential impacts of the project to the Beneficial Uses of the Coachella Valley Storm Water Channel (CVSC) and the Salton Sea. The RWQCB cites Code that requires that any change in the point of discharge, place of use or purpose of use of treated wastewater associated with implementation of the proposed project be approved by the Division of Water Rights of the RWQCB.

The comment letter from the California Department of Public Health, dated July 29, 2010, states that DPH has standards for engineering, design, operational and administration of the proposed recycled water project including regulations and requirements for different wastewater treatment systems.

IWA has compiled water quality studies of the project area. The analysis in the following text relies extensively on these five reports:

- The Water Balance Study prepared by Thomas Harder and Company dated December 2009
- Evaluation of Potential Groundwater Impacts by Thomas Harder and Company, dated March 9, 2011
- Water Reclamation Facilities for Reuse and Groundwater Recharge – Phase I Environmental Program – Technical Memorandum No. 1 Market and Demand Assessment by Carollo Engineers dated January 2010
- IWA 2005 Urban Water Management Plan Addendum by Black & Veatch, dated September 2008
- IWA 2007 Water Master Plan Update by Dudek, dated May 2008

4.5.2 Environmental Setting

The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of approximately 22 linear-miles pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

4.5.2.1 Existing Wastewater Management

VSD provides wastewater collection, treatment and disposal services within its approximately 195 square mile service area, which includes 98 percent of the City of Indio (UWMP, 2008). Under the existing conditions, the VSD WWTP treats wastewater to secondary treatment standards, manages and disposes of resulting sludge, and disposes treated wastewater effluent. VSD operates three parallel treatment processes: an activated sludge treatment process with a capacity of 7.5 MGD, an oxidation pond treatment process with a capacity of 2.5 MGD, and a constructed wetlands treatment process with a capacity of 1.0 MGD, for a total treatment capacity of 11.0 MGD (12,300 AFY). Sludge from the ponds is dewatered and hauled to farming operations in the Arizona where it is applied as fertilizer, soil conditioner or compost.

Currently, approximately 80 percent of the plant effluent is discharged to the Coachella Valley Storm Channel and approximately 20 percent is provided to adjacent tribal lands for irrigation purposes (UWMP, 2008). The 1.0 MGD of effluent that is treated through the 15-acre constructed wetlands, located just south of the WWTP, is discharged to the Coachella Valley Storm Channel. The constructed wetlands have also become the site for an educational program for the Coachella Valley Wild Bird Center. VSD discharges (NPDES permit – CA00104477/Order No R7-2010-0010) approximately 7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel, which terminates at the Salton Sea approximately 13 miles downstream of the VSD outlet.

4.5.2.2 Existing Coachella Valley Stormwater Channel Hydrology

The Channel northwest of the VSD WWTP discharge is dry except during periods of intense rainfall, which are rare given that the area averages only 3 inches of rain per year. The Channel southeast of the VSD outlet supports riparian vegetation by the combined flows from stormwater runoff, VSD WWTP, Coachella Valley Water District (CVWD) WWTP, the City of Coachella Sanitary District and irrigation flow returns from agricultural fields. The Water Balance Study prepared by Thomas Harder & Company (hereafter THC, December 2009) for the proposed project details the flows into the Channel (please refer to Appendix 4) which are summarized as follows. USGS gauges provide historical data as to the flows upstream of VSD (2,700 AF/yr) and near the Salton Sea (79,000 AF/yr). As mentioned previously, VSD WWTP discharges approximately 7,000 AF/yr of treated effluent, and CVWD WWTP treats over 5,000 AF/yr of effluent but discharges an undefined quantity into the Channel because much is diverted to

other uses. At most, approximately 15,000 AF/yr of Channel flows are attributable to the combined flows from VSD and CVWD WWTP's and stormwater with the remaining 64,000 AF/yr of Channel flows passing the gauge near the Salton Sea attributable to the City of Coachella Sanitary District and unmetered irrigation returns.

The Water Balance Study estimated that approximately 3 percent (2,200 AF/yr) of total surface water flows are lost due to evapotranspiration between the VSD outlet and the Salton Sea and that only 16 AF/yr of VSD flows percolate into the groundwater aquifer.

4.5.2.3 Proposed Reduced Effluent Discharge Impacts on Channel

As proposed, a large portion of the tertiary treated effluent from the VSD WWTP would ultimately be diverted for recycled water projects leaving 0.5 MGD to maintain riparian vegetation supported by the VSD WWTP discharge flows in the Channel. Under existing conditions the constructed wetlands treatment system located at the WWTP site currently processes approximately 1 MGD of treated effluent which is mixed with effluent from the pond system and discharged to the Channel. With implementation of the proposed tertiary treatment facilities to the VSD WWTP, the existing wetlands treatment facility could be eliminated.

The closest downstream agricultural irrigation return flow into the Channel occurs approximately 1.5 miles downstream from VSD based upon a review of aerial photos. VSD treated effluent comprises the primary flows supporting riparian vegetation in the first 1.5 miles downstream from the outlet, but these flows contribute a progressively smaller portion of Channel flows with increasing distance as the majority of downstream Channel flows are attributed to irrigation return flow or City of Coachella Sanitary District flows. The minimum quantity of VSD flows that will be required to maintain riparian vegetation in the Channel has not been firmly established, but has been estimated at about 0.5 MGD. It is therefore estimated that the current average flow rate of treated effluent available for recycled water use is 3.3 MGD with peak flow rates estimated to be as high as 4 MGD.

4.5.2.4 Recycled Water Demand Assessment

The Market and Demand Assessment Technical Memorandum prepared by Carollo Engineers dated January 11, 2010 (please refer to Appendix 6 of Technical Appendices, Volume 2) assessed large scale irrigation sites within or adjacent to the City of Indio and estimated the potential market demand for recycled water. The Assessment concluded that the potential customer demand from parks, golf courses, polo clubs, schools and home owner associations would exceed the supply of recycled water even with the projected increased effluent flows expected at build-out. The Market and Demand Assessment queried potential recycled water users on their interest in receiving recycled water and regarding current water sources and consumption. Most of the golf courses in the regions use private well water or Coachella Canal water (Colorado River Water from the All-American Canal) or a mixture of the two sources. Indio Municipal Golf Course receives irrigation water from IWA as do most of the city parks and local schools.

While not all large scale water consumers were reached, and not all that were reached were interested in receiving recycled water, the quantity of potentially available recycled water flows under current conditions (6,722 AF/yr) is much less than the potential demand (15,387 AF/yr) if all large water users were to switch to recycled water if available, as shown in Table 3-1 in the

project description. However, irrigation demand varies seasonally, and there may be more recycled water available during the winter than demand. The project proposes to use recycled water for which there is no irrigation demand to recharge the groundwater basin.

4.5.2.5 Groundwater Recharge

The project proposes to recharge of the groundwater basin with excess recycled water. The groundwater levels in the Indio Subbasin of the Coachella Valley Groundwater Basin, within which the project area is located, are declining at rates of 0.5-1.5 feet per the Evaluation of Potential Groundwater Impacts by THC (March 2011). According to the IWA Water Master Plan, the Basin has been in overdraft since the 1930's, resulting in groundwater level decline of more than 60 feet in portions of the Lower Valley. Complications of the overdraft condition of the Basin include ground subsidence and water quality degradation. The Basin consists of a shallow semiperched aquifer, an upper aquifer and a lower aquifer. The IWA supplies water to its service area via groundwater production wells that pump primarily from the lower aquifer. Only two of the 18 IWA production wells (IWA wells 1B and 1C) pump any groundwater from the upper aquifer (THC, 2011).

Groundwater recharge can be accomplished by spreading basins or by injections wells, termed aquifer storage and recovery (ASR) wells when they are constructed such that they can be used as either injection or production wells, subject to regulatory requirements. Spreading basins require large areas of land, suitable sediments and hydrologic connectivity with the aquifer in the portion of the basin targeted for recharge. Injection wells can be used where any of the conditions necessary for spreading basins are not met. Because the IWA produces groundwater primarily from the lower aquifer, this is the aquifer that is targeted for recharge. The preliminary determination is that spreading basins would not benefit the lower aquifer as desired because a layer or low permeability strata separates the upper aquifer from the lower aquifer (THC, 2011). For this reason, the project proposes to use injection wells to recharge the lower aquifer.

4.5.3 Regulatory Requirements for Recycled Water Recharge

The following text outlining the regulatory requirements for recycled water recharge is extracted from the THC Evaluation of Potential Groundwater Impacts from the IWA Recycled Water Program report dated March 9, 2011. Extracted language is presented in italics. Heading numbers have been changed to be consistent with this document.

Federal and State policies that apply to the use of recycled water for artificial recharge of aquifers include Federal and State Anti-degradation policies and State of California Department of Public Health (DPH) regulations for recycled water reuse. Federal anti-degradation policy, as specified in 40 CFR 131.12, requires individual states to adopt anti-degradation policies to ensure that water quality is maintained and protected. As it is up to the individual states to develop the policy and methods of implementation, further discussion of anti-degradation policy is focused on the policies adopted by California, as described below.

4.5.3.1 California Anti-Degradation Policy

The basic tenets of California's anti-degradation policy are outlined in State Water Resources Control Board (SWRCB) Resolution 68-16, which states:

1. *Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.*

2. *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.*

Implementation of California's anti-degradation policy is delegated to the individual Regional Water Quality Control Boards (RWQCBs) through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. SWRCB guidance for implementation of the antidegradation policy is outlined in Administrative Procedure 90-04, which outlines different levels of analysis that RWQCBs can require in order to evaluate a proposed project's impact on existing water quality. For projects where the potential impacts on water quality are anticipated to be minor, a "simple" anti-degradation analysis may be required. For projects that have the potential to significantly increase pollutant loadings to existing water, the RWQCBs can require a "complete" anti-degradation analysis.

For any proposed project that has the potential to alter the existing water quality, it must be demonstrated that the water quality change is consistent with the maximum benefit to the people of the State, and the change is balanced by significant benefits for economic and social development. Factors for consideration include:

1. *Past, present and probable beneficial uses,*
2. *Economic costs to maintain water quality compared to the benefits,*
3. *Environmental aspects of the proposed discharge, and*
4. *Consideration of feasible alternative control measures which might reduce, eliminate or compensate for negative impacts to water quality.*

4.5.3.2 Groundwater Quality Standards – Colorado River Basin Region

Established groundwater quality standards by the Regional Water Quality Control Board - Colorado River Basin are specified in the latest version of the Water Quality Control Plan (RWQCB, 2006). Beneficial uses of the groundwater for the Coachella Valley area include municipal, industrial and agricultural uses. Specific groundwater quality objectives include the following:

***Taste and Odors** – Groundwater for use as municipal or domestic supply shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses as a result of human activity.*

***Bacteriological Quality** – The concentration of coliform organisms shall not exceed the limits specified in California Code of Regulations (CCR) Title 22, Chapter 15, Article 3.*

Chemical and Physical Quality *– Groundwater shall not contain concentrations of chemical constituents in excess of the limits specified in CCR Title 22, Chapter 15, Article 4, Section 64435, Tables 2, 3 and 4 as a result of human activity.*

Brines *– Discharges of water softener regeneration brines, other mineralized wastes, and toxic wastes to disposal facilities which ultimately discharge in areas where such wastes can percolate to groundwater useable for domestic and municipal purposes is prohibited.*

Radioactivity *– Groundwater shall not contain radioactive material in excess of the limits specified in CCR Title 22, Chapter 15, Article 5, Sections 64441 and 64443.*

Table 4.5-1 summarizes the Applicable Water Quality Objectives and/or Criteria for Constituents of Concern. This table presents the water quality objectives determined necessary to protect the most sensitive beneficial use (MUN) of the Indio Subbasin of the Coachella Valley Groundwater Basin. The constituents of greatest concern are total dissolved solids (TDS), total Trihalomethanes (THMs), and nitrate. These constituents are of concern because the increased discharge from the treatment plant to the ASR wells is most likely to affect the concentrations of these constituents in the groundwater at the point of injection and down-gradient of the ponds. Additional constituents of concern are also included in Table 4.5-1.

Table 4.5-1
APPLICABLE WATER QUALITY OBJECTIVES AND/OR CRITERIA FOR CONSTITUENTS OF CONCERN

Constituent	Value / Range	Unit	Reference
pH	NA	Units	----------
TSS	NA	mg/L	----------
TDS	500 - Recommended 1000 - Upper 1500 - Short Term	mg/L	Title 22 (Secondary MCL)
Chloride	250 - Recommended 500 - Upper 600 - Short Term	mg/L	Title 22 (Secondary MCL)
MBAS	0.5	mg/L	Title 22 (Secondary MCL)
Ammonia-N	NA	mg/L	----------
Total Nitrogen	NA	mg/L	----------
Nitrate-N	10	mg/L	Title 22 (Primary MCL)
Arsenic	0.01	mg/L	Title 22 (Primary MCL)
Copper	1000	ug/L	Title 22 (Secondary MCL)
Zinc	5000	ug/L	Title 22 (Secondary MCL)
Cyanide	150	ug/L	Title 22 (Primary MCL)
bis(2-ethylhexyl)phthalate (1)	4	ug/L	Title 22 (Primary MCL)
Total THMs	80	ug/L	USEPA Stage 1 Disinfectants and Disinfection Byproducts Rule

NA: No Applicable Objective
(1) Also called di(2-ethylhexyl)phthalate

4.5.3.3 California State Regulations for Groundwater Recharge Using Recycled Water

Regulations for the use of recycled municipal wastewater for groundwater recharge are specified in CCR Title 22, Chapter 3 Recycling Criteria. The regulations are prepared by the DPH and are currently in draft form (the latest version is dated August 5, 2008). The regulations address artificial recharge by both surface spreading and injection wells. Recycled water to be

used for artificial recharge must be treated by either filtration or to disinfected tertiary standards as defined in Title 22 Chapter 3. The Project proposes to use advanced treatment including Reverse Osmosis (RO) for the recycled water, which meets the strictest interpretation of filtration as defined in the Recycling Criteria regulations. Further discussion of recycled water recharge requirements are related to this level of treatment.

For general requirements, the draft regulations stipulate that recycled water for a groundwater recharge project must be from a wastewater management agency that administers an industrial pretreatment and source control program. The source control program must include:

1. *An assessment of the nature and fate of DPH-identified contaminants;*
2. *Monitoring programs for DPH-identified contaminants of concern;*
3. *An outreach program to entities within the agency service area that contribute industrial, municipal and residential wastewater as an effort to control and manage contaminants in the wastewater; and*
4. *An up-to-date inventory of contaminants discharged into the wastewater collection system so that new contaminants can be readily evaluated.*

Prior to implementation of the recycled water recharge program, the responsible agency will be required to conduct a public review and hearing process to specify the details of the project and allow for public comment. The responsible agency will also be required to develop an Operation Plan for the recharge project that describes the operations, management and monitoring that will be required to implement the project. Finally, the agency will be required to develop an engineering report that describes the design of the reclamation project and demonstrates how it will comply with the regulations.

The DPH addresses the control of potential contaminants in the source water for recycled water recharge and down gradient receptors via a number of different engineering and analytical methods. The general categories of contaminants addressed include pathogenic micro-organisms, nitrogen compounds, other regulated chemicals and physical characteristics, and potential other contaminants. Monitoring will be required of both the treated recycled water and the groundwater from monitoring wells that will need to be constructed in the vicinity of the recharge facilities.

Control of Pathogenic Microorganisms
Control of pathogenic microorganisms is addressed through a combination of treatment and residence time in the aquifer system. Treatment can either consist of disinfected tertiary effluent or filtration. The minimum residence time for recycled water in the subsurface is six months. For the purpose of siting artificial recharge facilities (either injection wells or spreading basins), the locations of the facilities must be a distance from existing production wells satisfactory to ensure 12 months' residence time (as analyzed using a calibrated numerical groundwater flow model) or 24 months' residence time (as analyzed using an analytical approach).

Upon construction of injection wells or spreading grounds, the 6-month residence time is assessed through tracer tests and monitoring as outlined in the DPH-approved Operation Plan.

Control of Nitrogen Compounds
Control of nitrogen concentrations in the groundwater near a recycled water recharge facility is accomplished through monitoring and analysis of total nitrogen in the recycled water prior to injection or spreading. Samples must be collected twice a week and analyzed for total nitrogen.

Average weekly concentrations exceeding 5 mg/L must be addressed through reduction of nitrogen in the source water. Recycled water recharge would have to be suspended if average total nitrogen concentrations in the recycled water exceed 5 mg/L for four consecutive weeks.

Control of Other Regulated Chemicals and Physical Characteristics
For recycled water treated by RO, samples must be collected weekly for analysis of total organic carbon (TOC). The maximum allowable TOC in the recycled water would be determined based on the recycled water contribution, described below.

Recycled water must be analyzed quarterly for selected inorganic chemicals, radionuclides, organic chemicals, disinfection byproducts, lead and copper. In addition, a sample must be collected annually and analyzed for secondary drinking water constituents. Concentrations exceeding established Maximum Contaminant Levels (MCLs) require confirmation through resampling and analysis. Recycled water recharge must be suspended if the running 4-week average concentration of any constituent exceeds its respective MCL.

Required Monitoring for Other Contaminants
Based on recommendations from the State Water Resources Control Board's Science Advisory Panel, recycled water recharge projects may be required to collect and analyze recycled water samples from a number of chemicals of emerging concern (CECs). The recommendations include monitoring for health-based indicators such as caffeine, NDMA, 17b-estradiol, and others. It is unclear if and when these recommendations will be added to the monitoring requirements for artificial recharge projects.

Diluent Requirements/Recycled Water Contribution
Recycled water must be blended with another source of potable water prior to introduction into the subsurface via injection wells or spreading facilities. The blend water is referred to as "diluent" water and can come from a number of sources (e.g. imported water) as long as it meets certain water quality criteria. Underflow through the area is also considered a diluent water source. The percentage of recycled water in the blend is referred to as the recycled water contribution (RWC). The maximum initial RWC for recharge projects utilizing surface spreading basins and injection wells is 0.5 (50 percent) if the recycled water is treated with RO.

This RWC is calculated as a 60 month rolling average. The RWC can be increased over time as long as certain monitoring requirements and analytical results are met.

Required Reporting
The DPH and RWQCB will require submittal of analytical results of recycled water monitoring on a monthly basis. Water quality results exceeding MCLs or total coliform requirements must be reported within 48 hours of receiving the results. Annual reports of recycled water recharge operations must be submitted to the DPH and RWQCB. In addition, the engineering report for the project must be updated every five years.

4.5.4 Project Impacts

4.5.4.1 Significance Criteria

The following hydrology and water quality issues were carried over to the EIR from the Initial Study and are the proposed thresholds for assessing and determining significant drainage or water quality impacts from implementing the proposed project.

Would the proposed project:

a. Violate any water quality standards or waste discharge requirements?

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation onsite or offsite?

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?

e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, such as from areas of material storage, vehicle or equipment maintenance (including washing or detailing), waste handling, hazardous materials handling or storage, delivery areas, loading docks, or other outdoor areas?

f. Otherwise substantially degrade water quality?

g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

i. Expose people or structures to significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

j. Inundation by seiche, tsunami, or mudflow?

The following issues were identified in the Utilities/Service System category of the Initial Study as having potentially significant impacts and have been carried forward into this DEIR for review and analysis.

> Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?
>
> Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
>
> Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Because these issues are so closely related to the Hydrology/Water Quality evaluation contained in this Subchapter, the Utilities/Service System issues quoted above have been integrated into this subchapter, and they are proposed as thresholds for assessing and determining the potential impacts of the proposed project.

The following issues were identified within the Geology/Soils category of the Initial Study as having potentially significant impacts and have been carried forward into this DEIR for review and analysis.

> Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related liquefaction?

Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite liquefaction?

Because these issues are so closely related to the Hydrology/Water Quality evaluation contained in this Subchapter, the Geology/Soils issues quoted above have been integrated into this subchapter, and they are proposed as thresholds for assessing and determining the potential impacts of the proposed project.

In addition to the broad scope threshold criteria summarized above, several specific questions posed in comments received in response to the Notice of Preparation will be addressed in this Subchapter. These comments were referenced in the Introduction (Section 4.5.1) and the actual comment letters are provided in Appendix 8.2 for those persons interested in reviewing the detailed comments.

4.5.4.2 Project Impact Analysis

a. Violate any water quality standards or waste discharge requirements?

Based on the Initial Study and the comments received on the Notice of Preparation, there are two key water issues that must be addressed in order to consider implementation of the IWA Recycled Water Project. The first issue requiring evaluation and resolution is whether the proposed recycled water project can be installed and operated and not violate any water quality standards or waste discharge requirements? This issue can be analyzed from two perspectives: water quality antidegradation requirements relative to the adopted Regional Water Quality Board's "Basin Plan"; and potential effects on groundwater quality and potable water supply within the Indio Subbasin. The second issue that must be addressed is the proposed project's potential effects on beneficial uses of the Coachella Valley Stormwater Channel downstream of VSD's discharge.

As discussed previously, the water supply in the project area relies primarily on groundwater from the Indio Subbasin of the Coachella Valley Groundwater Basin. The Basin, which is not adjudicated, is in an overdraft condition. Water reclamation will help to reduce the burden upon the groundwater supply by increasing the efficiency at which the groundwater is used by offsetting some non-potable water demands. Providing recycled water for irrigation will also make more Canal water available for other uses, including the possibility of treating the Canal water for potable uses.

It is important to understand that the use of ASR wells for groundwater recharge is the last option for use of the recycled water generated by the IWA Recycled Water Project. In other words fully disinfected recycled water from the WRPs will first be used for consumptive purposes, primarily landscape irrigation. Any excess flows, primarily during the winter, will be delivered to the ASR well(s) where the additional treatment (MF/RO) will be implemented prior to injecting the recycled water through the wells into the regional aquifer.

Treatment requirements for groundwater recharge are more stringent than those required for irrigation. The project alternatives propose tertiary treatment that complies with Title 22 Standards for recycled irrigation water to be installed at VSD WWTP. Supplemental advanced treatment required for groundwater recharge water would be located near the potential ASR injection wells, currently proposed for Posse Park, the Indio Golf Course or one of several other potential sites within the City. Through this design only the effluent destined for groundwater

recharge would be treated through the costlier groundwater recharge treatment system. DPH requires monitoring of treated recycled water and from monitoring wells required to be located in the vicinity of recharge facilities. Analysis is required that demonstrates recycled water would not reach production wells within 12 or 24 months or recharge (depending upon assessment method) prior to construction of recharge facilities, and tracer tests and monitoring are required after construction that verify a minimum 6-month residence time. The maximum initial portion of recharge water that can consist of reverse osmosis treated recycled water is 50%. The remaining 50% of "recharge water" may consist of imported and/or "underflow" water. Underflow refers to the flow of groundwater in the aquifer beneath the recharge location. If regulatory requirements are met, the portion of recharge that consists of recycled water can be increased over time.

Groundwater recharge of recycled water must be analyzed regularly in accordance with DPH guidelines and must be suspended if the running 4-week average concentration of any constituent exceeds its respective Maximum Contaminant Level (MCL). Groundwater recharge of recycled water is prohibited if average weekly concentrations of nitrogen exceed 5 mg/L for four consecutive weeks, based upon twice weekly testing. Table 4.5-2 summarizes the pertinent water quality data for each of the water sources for certain pollutants, including MCLs, measured water quality for the aquifers, and the recycled water.

Table 4.5-2
WATER QUALITY OF THE AQUIFER AND RECYCLED WATER

Water Quality Constituent	Maximum Contaminant Level (MCL) for Drinking Water (mg/L)	Upper Aquifer (IWA Wells 1B and 1C)	Lower Aquifer	Recycled Water	
				For Irrigation Purposes (mg/L)	For Groundwater Recharge (mg/L)
pH	6.5 – 8.5	8.0	8.0	7.0 – 8.5	6.5 – 8.5
TDS	500 (1)	~300	160 – 240	< 600	< 100
Nitrate (as N)	10 (2)	0.7 – 1.0	0.55 – 5.3	< 10	< 1.0
THMs (4)	0.08 (5)	< 0.005	< 0.005	N/A	< 0.08

Notes:
1. Secondary standard
2. TDS has a Secondary MCL with a recommended limit of 500 mg/L.
3. Nitrate has a Primary MCL with a limit of 45 mg/L as NO_3.
4. THMs = sum of four trihalomethanes: chloroform, bromoform, bromodichloromethane, dibromochloromethane
5. THMs have a Primary MCL

An analytical groundwater flow model was constructed to evaluate the impact to groundwater levels and potential travel times for recycled water using four hypothetical ASR well sites (THC, 2011). The model assumed that all of the water diverted from VSD would be diverted to ASR wells, which very likely overstates the potential impacts of the recharge efforts as it is expected that a considerable quantity of recycled water made available would be applied as irrigation. Based upon the model, the maximum groundwater elevation change in the immediate vicinity of the injection wells would be a 4-foot rise. Maximum groundwater elevation change at production wells in the project area would be between one and three feet. The model of conceptual recycled water travel time within the aquifer estimated that water injected at the conceptual well sites would not reach any down gradient production wells within two years of injection. The California Department of Public Health (DPH) requires that recycled water not reach production wells for 24-months for the control of pathogenic organisms.

The project proposes to use RO to treat the recycled water that would be injected into the groundwater basin. RO is a pressure driven membrane process that is able to remove soluble species (including TDS, chloride, calcium, sulfate, hardness, nitrate and microconstituents) from water at high efficiencies; typically 90 to 98 percent for most compounds. Table 4.5-3 presents typical removal efficiencies for selected water constituents. Accordingly, RO results in a low TDS produce water (typically less than 100 mg/L) with a low overall mineral content and very low concentration of dissolved organic compounds.

Table 4.5-3
RO REMOVAL EFFICIENCIES

Constituent	MF/RO Removal Efficiency(1)
TSS	100%
TDS	95%
Chloride	95%
MBAS	90 – 95%(2)
Ammonia - nitrogen	90 - 95%(3)
Total Nitrogen	90 - 95%(3)
Nitrate	95%
Arsenic	89%
Copper	85%
Zinc	70%
Cyanide	90%
bis(2-ethylhexyl) phthalate	98%
Total THMs	85 - 98%(4)

(1) From a technical memo prepared for the City of Los Angeles (Damon S. Williams, LLC, 2005)
(2) Estimate based on typical RO removal efficiency for organic compounds
(3) Based on pilot testing by Carollo Engineers, Inc., 2001
(4) Estimated from literature values

Source: Victor Valley Wastewater Reclamation Authority "Cumulative Impact Analysis, Final Draft," September 2010, Larry Walker Associates, Inc.

State and Federal water quality laws require that discharges not result in an exceedance of water quality standards. Discharges from proposed IWA Recycled Water Project are not expected to result in either near-field or far-field exceedances of applicable water quality objectives, including nitrate and TDS. As shown in Table 4.5-2, the expected values of recycled water from the treatment plant and the ASR treatment facilities meet drinking water standards for TDS, and nitrate. The expected TDS concentration is slightly higher than the range of water quality from the Upper and Lower Aquifers in the Indio Subbasin. The expected nitrate values are also greater than the range of nitrate values in all of the water suppliers.

The advanced treatment processes proposed for the recycled water destined for injection wells is expected to remove undesirable constituents from the water and result in water quality that is superior to the native groundwater, thereby satisfying both SWRCB anti-degradation policy and RWQCB basin plan objectives (THC, 2011).

The exact location and configuration of the proposed ASR wells has not been determined. Final selection of ASR well location would be required to ensure a minimum distance and travel time for recharged water prior to encountering production wells in accordance with regulatory requirements.

Beneficial Uses

Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Coachella hydrologic subunit, the groundwater basin within which the project is proposed, are: municipal and domestic water supply; industrial service supply; and agriculture supply. The impact of the proposed IWA Recycled Water Project and groundwater quality is evaluated under Issue a. of this Subchapter. The analysis of potential groundwater impacts conducted for the project (THC, 2011) indicates that the recharge water will be superior in quality to the native groundwater, and as such will have no adverse impacts on the beneficial uses of the groundwater in the basin.

Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Coachella Valley Stormwater Channel are freshwater replenishment; warm freshwater habitat; wildlife habitat; protection of rare, threatened or endangered species, and contact and non-contact water recreation (although recreation uses are listed as unauthorized uses). Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Salton Sea (to which the Coachella Valley Stormwater Channel is tributary) are aquaculture; contact and non-contact water recreation; warm freshwater habitat; wildlife habitat; protection of rare, threatened or endangered species, and potentially for industrial service supply. The potential impacts of the proposed project on the biological habitat-related beneficial uses of the effected waterways are addressed in Section 4.3 Biological Resources of this document. Based on identified mitigation, the biological resource effects in the Channel were concluded to be a less than significant adverse impact.

USGS gauges provide historical data that Channel flows upstream of VSD are 2,700 AF/yr and flows near the Salton Sea are 79,000 AF/yr. VSD WWTP discharges approximately 7,000 AF/yr of treated effluent. The VSD effluent accounts for less than 10% of the Channel contribution to the Salton Sea, which is only one of many surface and subsurface waters that flow to the Sea. Reduction in VSD effluent discharged to the Channel would not have an impact on beneficial uses of the Salton Sea with the possible exception of water quality related impacts.

According to the Basin Plan, the Salton Sea water quality is primarily constrained by rising salinity, which adversely impacts spawning of the recreationally important fisheries that have been introduced into the Sea from the Gulf of California. The salinity levels of the Salton Sea are already near or exceed the levels at which the fisheries are adversely impacted, and salinity levels in the Sea will continue to rise because inflow is primarily high salinity agricultural flows and there is no loss of water from the Sea other than by evaporation. While the reduction in VSD effluent would constitute a very small percentage of flow reduction into the Sea, the reduced VSD flows would contribute to a cumulative decrease in total flows into the Sea that has the potential to increase salinity levels more rapidly than would otherwise occur. The Basin Plan identifies several alternatives that could mitigate rising salinity levels and thereby perpetuate the fisheries that have been developed and identified as beneficial uses.

The Basin Plan states that “wastewater reclamation and reuse is encouraged by this Regional Board.”

Disposal of Wastewater

The proposed tertiary treatment that complies with Title 22 Standards for recycled irrigation water to be installed at VSD WWTP and supplemental advanced treatment required for groundwater recharge water would cause an increase in the quantity and/or concentration of

wastewater that is separated from the "product" water, that which would be reclaimed for irrigation or groundwater recharge. The incremental increase in wastewater that would result from the treatment process to produce Title 22 irrigation water can be returned to the sewer system and treated along with existing wastewater flows. The supplemental advanced treatment, reverse osmosis process (RO), proposed for the groundwater recharge water would require a different disposal process for the wastewater. The proposed process is described in the following text; however, site locations for the specific infrastructure required have not been selected.

RO processes the water fed into the system for treatment, "feedwater", and produces a product water stream and a brine concentrate stream. The product water is a low salinity permeate stream which is typically about 85-percent of the feedwater flowrate, while the brine or concentrate stream contains constituents in the feedwater that were not able to pass through the RO membranes, primarily dissolved solids. The product water stream would be further treated with an advanced oxidation process to remove pharmaceuticals and personal care products and then used for groundwater recharge.

Several alternatives are under consideration for disposal of the RO concentrate stream, and assuming that the project is phased, the treatment technologies would be enhanced/expanded as the volume of concentrate increases. First, a determination would be made if the reject water could be returned to the VSD treatment plant for processing. If the TDS concentrations are too high, then alternative methods would have to be considered for the reject water. For example, assuming that the capacity of the RO system starts at 1 MGD in a Phase 1 project, the RO concentrate flow rate would be about 168 acre-feet per year (AFY), or about 15-percent of the feed water to the RO. This stream could be discharged directly to about 20-acres of lined ponds for evaporation and disposal. Another alternative for the Phase 1 project would be to irrigate the RO concentrate onto salt tolerant grass (such as Jose Tall Wheatgrass). The irrigation area would be set up with a tile drainage system to recover subsurface drainage and prevent salt intrusion into the groundwater below the farmland. Assuming that about 30-acres of farmland would be planted in Phase I, about 140 AFY of the RO concentrate would be irrigated. Use of the RO concentrate for irrigation in this manner would have the added benefit of reducing the overall volume for final disposal, effectively increasing the water recovery from 85-percent to around 96-percent. The remaining volume and the subsurface drainage returning from the irrigated land would be disposed of in about 5-acres of lined evaporation ponds.

The irrigation area would be increased in size to 75-acres as the RO capacity is expanded to process 3 MGD. As the project increases in capacity, the residual irrigation drainage and excess RO concentrate would require additional treatment to further reduce the volume for pond evaporation. This would be accomplished using a treatment process such as electrodialysis reversal (EDR). Assuming an EDR recovery of 60-percent, the second process would reduce the volume for final disposal to less than 100,000 gallons per day, which would be an increase in the overall water recovery to more than 97-percent. The product stream from the EDR would be returned to the groundwater recharge system while the more concentrated stream would be discharged to about 11-acres of lined evaporation ponds for final disposal.

When the RO plant capacity reaches approximately 6 MGD a third treatment technology would be introduced to increase the overall water recovery. It has been assumed for this analysis that the irrigation area would not be expanded beyond 75-acres. If additional irrigation area is available, then the capacity of the treatment processes could be reduced accordingly. The third treatment technology could be a modification of the EDR system, a spray evaporation system,

or a mechanical vapor compression evaporation system, any of which would be designed to minimize the increase in the final volume of brine for disposal. Introducing one of these treatment approaches would limit the increase in the total evaporation area required to about 13-acres.

When the RO plant reaches its ultimate capacity of 9.6 MGD, all treatment processes would need to be increased in capacity. The third treatment technology (spray evaporation or mechanical vapor compression) would be applied to a larger portion of the flow in order to reduce the final volume that requires solar evaporation. In this case, assuming the use of spray evaporation, the total evaporation area necessary would increase to around 15.5-acres.

The irrigated grassland would be harvested, typically four times per year, and would typically be blended with alfalfa and sold as animal feed. Annual maintenance would be required for the evaporation ponds to remove vegetation growth and maintain the perimeter of the ponds. Periodic maintenance would require ponds to be taken off line in order to remove built-up solids. The solids would be disposed of at a local landfill. Additional pond area beyond 23-acres would be necessary to allow one or more ponds to be taken out of service for maintenance. The lined ponds would prevent leakage of the concentrate to the groundwater system. Leak detector systems would be installed to confirm that the pond liner integrity has not been breached.

Treatment of the concentrate stream would ultimately require 23-acres of lined-evaporation ponds plus additional acreage to allow areas to be off-line for maintenance, 75-acres or more of farmland with subsurface drainage to the lined-evaporation ponds, pipelines to convey the concentrate stream from the RO plan to the irrigation area, EDR, spray evaporation and/ mechanical vapor compression equipment. As mentioned previously, site locations for the specific infrastructure required have not been selected. Therefore, these facilities will have to be evaluated in a subsequent CEQA environmental review process after selection of one or more ASR sites. Prior to installation of the ASR groundwater recharge system, disposal of any excess treated effluent would continue to be to the Whitewater River channel under existing or comparable discharge requirements.

b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

As discussed previously, the water supply in the project area relies primarily on groundwater from the Indio Subbasin of the Coachella Valley Groundwater Basin. The Basin, which is not adjudicated, is in an overdraft condition. Water reclamation would help to reduce the burden upon the groundwater supply by increasing the efficiency at which the groundwater is used by offsetting some non-potable water demands. Providing recycled water for irrigation would also make more Canal water available for other uses, including the possibility of treating the Canal water for potable uses. Further, the project proposes to direct recycled water for which there is not irrigation demand to groundwater recharge.

The proposed groundwater recharge would inject treated recycled water into the lower aquifer. An analytical groundwater flow model was constructed to evaluate the impact to groundwater levels from injection of recycled water using four hypothetical ASR well sites (THC, 2011). The model assumed that all of the water diverted from VSD would be diverted to ASR wells, which very likely overstates the potential impacts of the recharge efforts as it is expected that a considerable quantity of recycled water made available would be applied as irrigation. Based

upon the model, the maximum groundwater elevation change in the immediate vicinity of the injection wells would be a 4-foot rise. Maximum groundwater elevation rise at production wells in the project area would be between one and three feet.

Under existing conditions, VSD discharges (NPDES permit – CA00104477/Order No R7-2010-0010) approximately 7,000 AF/yr of treated effluent to the unlined Coachella Valley Stormwater Channel, which flows towards the Salton Sea approximately 13 miles downstream of the VSD outlet. The proposed project would reduce VSD discharges to the Channel to approximately 0.5 MGD, or roughly 560 AF/yr. The Water Balance Study estimated that approximately 16 AF/yr of VSD flows between the VSD outlet and the Salton Sea percolate into the groundwater aquifer under current conditions. The decrease in flows from VSD to the Channel would likely result in a decrease in the VSD flows that percolate into the groundwater aquifer. In the context of a groundwater basin that is estimated to experience average annual decrease in groundwater storage of approximately 42,000 AF/yr (CVWD 2002 as cited in THC 2011) and the estimated natural recharge to the Indio Subbasin of 49,000 acre-ft/yr (THC, 2009), the impact of reduced flows from VSD to the Channel on groundwater would be negligible.

Further, the vast majority of the effluent that is not discharged into the Channel would be applied as irrigation or injected into the aquifer and so would not all be “lost” from the aquifer. Irrigation uses for the diverted water would result in return flow to the groundwater, which would offset the groundwater recharge beneath the channel and, in some cases, could exceed the current groundwater recharge. Also, artificial recharge of the VSD recycled water via ASR well would substantially increase the groundwater resources of the Indio Area.

The proposed project will have a major beneficial effect on the groundwater resources of this Subbasin by reducing future extractions of groundwater. Based on the facts and findings presented above, the conclusion reached in this analysis is that the proposed project, installation and operation of the IWA Recycled Water Project, can proceed without causing any significant impact on groundwater supplies. No significant adverse environmental effect on groundwater supplies or groundwater recharge is forecast so there would not be a net deficit in aquifer volume as a result of the proposed project. As described in the preceding text, the Indio Subbasin would benefit from the proposed project.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation onsite or offsite?

The pipeline routes may affect the Coachella Valley Stormwater Channel/ Whitewater River and the Coachella Canal. As currently envisioned, pipelines will cross channels by boring and jacking or other method of avoidance, but mitigation is incorporated in Section 4.3 Biological Resources outlining minimum requirements if the project were to result in direct impacts to channel bed and bank or “Waters of the United States” as defined by the Clean Water Act. None of the other project facilities are expected to be located within or immediately adjacent to a stream channel where concentrated surface runoff occurs.

In general, IWA Recycled Water Project facility sites are located in areas that have minimal slopes and that are subject to sheet flow when surface runoff occurs. Most of the pipelines required to support the IWA Recycled Water Project occur within existing roadways. Implementation of the proposed project facilities will cause minor changes to absorption rates and the amount of runoff from the project sites, which include the VSD, satellite treatment

facilities, booster stations and ASR wells. The installation of the RO concentrate evaporation ponds and agricultural field drains would also modify the local drainage, but the ponds would contains any precipitation that falls within their boundaries, and would not contribute additional runoff downstream of a pond site.

Even though the whole of the project area has shallow slopes, the modifications to surface flows at each project site has a potential to concentrate flows downstream and cause downstream erosion and sedimentation. This potential impact is caused by two changes in the landscape: first, the impervious surfaces generate more runoff than the natural soils at each facility site; and second, the upstream flows must be intercepted and diverted around each facility site and then released on the downstream side of a facility, most often as concentrated flow that increases the potential for erosion. As might be expected, the greater the rainfall, the greater the potential for the proposed project facilities to cause significant erosion and sedimentation.

Because the proposed IWA Recycled Water facilities are still in the early stages of engineering design, detailed civil engineering of the specific facility infrastructure has not yet been completed. As a result, the drainage design of each facility is not yet completed. Where a specific design is unavailable for evaluation and a potential exists for significant disruption in the local drainage system, the evaluation shifts to establishment of design requirements for the drainage system, expressed as mitigation measures, in order to control a potential adverse impact to a less than significant impact level. These potential impacts and design requirements can be divided into those potential impacts during construction (short-term drainage design measures) and after construction (long-term drainage design measures)

The process of installing the all of the IWA Recycled Water facilities (VSD treatment facilities, satellite treatment facilities, booster stations, ASR wells, RO concentrate evaporation ponds and agricultural field drains) would result in construction activities that could result in erosion and sedimentation. The State Water Resources Control Board (SWRCB) adopted the General Construction Activity Storm Water NPDES (National Pollutant Discharge Elimination System General Permit) in 1992 thereby regulating construction activity that would result in the disturbance of 5 acres or more. Water Quality Order 99-08-DWQ lowered threshold of regulated activity to one acre in 2002. The proposed IWA Recycled Water facilities will impact more than one acre of land and therefore, must file a Notice of Intent (NOI) with the SWRCB prior to initiation of construction activity. The General Permit requires that the project developer file a NOI with the SWRCB and authorizes discharge of stormwater associated with construction given implementation of a Storm Water Pollution Prevention Plan (SWPPP) that eliminates or reduces non-stormwater discharges to storm sewer systems and other “Waters” as defined by the Clean Water Act.

The General Permit prohibits the discharge of material other than stormwater and all discharges that contain hazardous substances in excess of reportable quantities established at 40 Code of Federal Regulations 117.3 or CFR 302.4, unless a separate NPDES permit has been issued to regulate those discharges. Regardless of the need for a construction NPDES permit, the project must implement “best management practices” (BMP) as part of the SWPPP to reduce the potential for soil erosion or pollutants leaving a construction site and adversely affecting surface water. The Riverside County Flood Control and Water Conservation District, the County of Riverside the Coachella Valley Water District, Cities of Desert Hot Springs, Palm Desert, Banning, Indian Wells, Palm Springs, Cathedral City, Indio, Rancho Mirage, and La Quinta are co-permittees within the Coachella Valley with the Colorado River Basin Regional Water Quality Control Board.

The Stormwater NPDES Permits require implementation of a Standard Urban Stormwater Mitigation Plan (SUSMP)/Water Quality Management Plan (WQMP) with design standards for BMPs, adopted in 2008. The BMPs to infiltrate and/or treat stormwater pollution are required to be incorporated into the design phase of new development and redevelopment in order to minimize the discharge of pollutants of concern. Such design standards ensure that stormwater runoff is managed for water quality and quantity concerns. Mitigation measures must be implemented to reduce the effects of potential impacts from stormwater pollution to a less than significant level. The intent of these measures is to accomplish the following: capture upstream sheet flow and manage it so these flows will be retained or detained on the facilities sites, or alternatively discharged downstream to an existing local/regional drainage facility with sufficient capacity to handle such flows without causing downstream flooding, erosion or sedimentation; and capture increased runoff generated from the facility sites and retain or detain these flows so that discharges will not cause or contribute substantially to downstream flood hazards, treat the discharges to ensure that man-made pollutants are not incorporated into the downstream discharges, and discharge the onsite flows into existing local/regional drainage facility with sufficient capacity to handle such flows without causing downstream flooding, erosion or sedimentation.

The mitigation measures are provided in the Mitigation Measures section below. With implementation of these design requirements on both construction activities/disturbances and the long-term occupancy of the IWA Recycled Water facility sites, the changes in the existing individual facility site drainage systems can be controlled to prevent significant downstream erosion and sedimentation.

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?

Please refer to the discussion under Issue c. above. None of the IWA Recycled Water facility sites is expected to directly impact a stream or river, with the possible exception of the pipelines. All facility sites are located in areas that are essentially flat, and subject to sheet flow, not concentrated surface runoff. The proposed IWA Recycled Water facilities will alter local drainage systems and increase runoff from the individual facility sites. A potential for increased flooding exists, but mitigation measures described in Issue c. above and presented in the Mitigation Measure section below will control runoff from the facility sites in a manner to prevent the proposed project from causing or contributing to significant downstream flood hazards.

e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, such as from areas of material storage, vehicle or equipment maintenance (including washing or detailing), waste handling, hazardous materials handling or storage, delivery areas, loading docks, or other outdoor areas?

For the reasons outlined under Issues c. and d. above, the proposed project will not cause or contribute surface runoff that can exceed the capacity of existing or planned stormwater drainage systems. Further, mitigation requirements to control both short- and long-term sources of water pollution or to treat the stormwater discharged from the project site will ensure that the proposed project is not a substantial source of polluted runoff.

The proposed recycled water project is designed to treat and divert a portion of wastewater flows generated in the IWA service area for reuse as irrigation or groundwater recharge. Because of the type of treatment facility and the backup provided by the existing VSD

wastewater collection system, the potential for an accidental spill that could be discharged to the surrounding environment is considered to be negligible. All effluent leaving the VSD facility would be treated to Title 22 standards. If an accidental spill occurs within the proposed improvements, the delivery of effluent flows to the affected area can be stopped. This management option ensures that the treated effluent leaving the VSD site will not become a substantial additional source of polluted runoff. The RO concentrate stream design will include safeguards to ensure that an accidental spill would not introduce brine waste into the groundwater system and will be evaluated in a subsequent environmental document.

f. Otherwise substantially degrade water quality?

All of the potential sources of pollution and water quality degradation have been evaluated in the previous five sections of this Subchapter. The Evaluation of Potential Groundwater Impacts from the IWA Recycled Water Program (THC, 2011) found that the proposed groundwater recharge would recharge recycled water that is of a higher quality than native groundwater. Use of recycled water for irrigation also does not pose a significant potential to degrade water quality because it will also meet Title 22 requirements and drinking water chemical standards. No other proposed project activity would result in degradation of water quality. Future construction and operation impacts on surface water quality will be controlled through implementation of mandatory best management practices that is required to meet regulatory requirements through the implementation of a Stormwater Pollution Prevention Plan (SWPPP) during short-term construction activities and a Water Quality Management Plan (WQMP) during the long-term operations of all of the IWA Recycled Water Project facilities. No other activities have been identified in conjunction with the proposed project that could otherwise substantially degrade water quality.

g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The proposed project does not include any residential housing. Therefore, it has no potential to expose any residential housing to a 100-year flood hazard zone.

h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

The National Flood Hazard Layer developed by FEMA indicates that most of the City of Indio south of Interstate 10 is within a “Shaded X Zone.” This flood hazard zone is used to indicate areas with a 0.2% annual chance of flood (also referred to as the 500 year flood) or a 1% annual chance (also referred to as the 100 year flood) of sheet flow flooding with an average depth of less than 1 foot. Typically the entire City of Indio is not expected to flood, but rather storm flows may concentrate in low points, particularly roadways, and be conveyed to stormwater channels. The stormwater channels within the project area are expected to flood as they are designed to carry stormwater.

All of the proposed project activities would either avoid impacts within channels or would locate infrastructure below channels by boring and jacking pipelines beneath the surface. The exact location of the ASR wells and brine evaporation ponds and associated infrastructure have not been selected. Subsequent environmental analysis will be required for any facilities for which final locations have not been proposed and evaluated. Design of infrastructure, particularly evaporation ponds, would be required to be constructed such that storm flows would not carry brine or solids out of the pond with a high margin of safety. With implementation of mitigation

measures proposed herein, the proposed project can be implemented without significantly impeding or redirecting flood flows.

i. Expose people or structures to significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Please refer to the discussion under Issue h. above. Figure S-10 Dam Failure Inundation Zones of the Riverside County General Plan Safety Element shows no dam-related hazards in the project area. No mitigation is required.

j. Inundation by seiche, tsunami, or mudflow?

The project area is located 13 miles from the Salton Sea and 75 miles from the Pacific Ocean. There is no significant body of water in the project area that would pose a risk of seiche in the project area of impact. There is no potential for tsunami to reach the project area. There is potential for mudflow, particularly within stormwater channels. All of the proposed project activities would either avoid impacts within channels or would locate infrastructure below channels by boring and jacking pipelines beneath the surface. The exact location of the ASR wells and brine evaporation ponds and associated infrastructure have not been selected. Subsequent environmental analysis will be required for any facilities for which final locations have not been proposed and evaluated. No significant risk of inundation by seiche, tsunami or mudflow is identified, and no mitigation is required.

Utility and Service System Thresholds

Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Issue a. of this Subchapter and the Evaluation of Potential Groundwater Impacts from the IWA Recycled Water Program (THC, 2011) in Appendix 5 of the Technical Appendices (Volume 2) that accompany this DEIR provide a detailed evaluation of the wastewater treatment requirements related to the Colorado River Basin Regional Board and the Colorado River Basin Plan. Based on the facts and findings in this detailed analysis, the proposed IWA Recycled Water Project can be implemented without exceeding any wastewater treatment requirements that may be imposed by the Colorado River Basin Regional Board.

Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

The proposed project includes the construction of new and expanded wastewater treatment facilities designed to meet the fundamental objectives of providing recycled water for large-scale irrigation applications within the IWA service area and of providing recycled water for groundwater recharge. At present the water supply in the project area relies primarily on groundwater. The tertiary treatment and RO wastewater treatment facilities proposed by the project are the subject of this EIR and have been developed as an alternative method for providing supplemental water that will reduce reliance on nonrenewable groundwater from an aquifer in overdraft.

Implementation of the proposed project will not contribute to significant growth, specifically growth beyond that permitted by the general plans of land use jurisdictions in the project area as allocated in regional planning documents. The purpose of the proposed project is to provide

a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area. Based on the analysis in this document, the installation of the IWA Recycled Water Project can be accomplished without causing significant unavoidable adverse environmental impacts.

Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Stormwater flows within the project area may be altered by installation of the pipelines, WWTP facilities or associated infrastructure. However, due to the small areal extent of these facilities and the fact that they will be typically installed in areas that are already impervious or highly compacted, no measurable increase in runoff is forecast to result from installing these new facilities. During construction, the construction/installation of the proposed facilities has a potential to contribute stormwater flows. Because the combined area of impact of all of the project components is larger than one acre, a NPDES general construction permit will have to be filed and a SWPPP and WQMP compiled and implemented with best management practices for short-term and long-term stormwater management. Therefore, based on the mandatory implementation of SWPPP and WQMP components, potential stormwater flows related to installing the proposed facilities will not cause any significant adverse water quality impacts within the project APE. After the pipelines are installed beneath roadways or across channels, no substantial adverse change in stormwater flows is forecast to occur due to operation of the proposed underground facilities.

Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related liquefaction? And/or **Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite liquefaction?**

Figure 5.6-2 Geological Hazard Map of the General Plan shows that the eastern portion of the City of Indio is susceptible to liquefaction due to groundwater levels that are typically within 30 feet of the ground surface. Figure S-3 Generalized Liquefaction of the Riverside County General Plan also depicts the project area as highly susceptible to liquefaction due to shallow groundwater and susceptible sediments. Groundwater recharge could exacerbate liquefaction conditions, or create them due to water mounding near injection wells, if recharge were to raise the shallow groundwater. The Evaluation of Potential Groundwater Impacts by THC indicates that groundwater levels in the upper aquifer have historically been 90 to 100 feet below the ground surface (bgs). It further states that shallow groundwater found at 40 to 60 bgs in the vicinity of the VSD WWTP is attributed to a semi-perched aquifer. The proposed groundwater recharge would inject treated recycled water into the lower aquifer, which is part of the regional aquifer. The regional aquifer is hydrogeologically separated from the semi-perched aquifer by multiple confining layers of low permeability sediments. Any change in groundwater level associated with the proposed groundwater recharge would only occur in the regional aquifer. (Thomas Harder, personal communication, April 6, 2011.) Based upon this information, it is determined that the potential for the proposed project to exacerbate liquefaction-related hazards in the project area is very low.

<u>Specific Issues Raised in Response to the Notice of Preparation and at the Scoping Meeting</u>

Several specific questions regarding potential IWA Recycled Water Project impacts were raised in two of the comment letters, the Regional Water Quality Board and the Department of Public Health. Copies of these letters are reproduced, with comment bracketing, in Appendix 8.2 of

this DEIR. Summaries of comments relevant to the Hydrology and Water Quality section, and responses to these comments, are presented in the following text. Additionally, members of the IWA Board raised questions, which are also included here.

IWA Board

Comment: Is there a contractual obligation to discharge a certain amount of treated effluent into the channel?

Response: As far as is known there is no contractual obligation to discharge a specific volume of treated effluent into the Whitewater Channel.

California Regional Water Quality Control Board

Comment: The California Regional Water Quality Control Board (RWQCB) states that the EIR should consider potential impacts of the project to the Beneficial Uses of the Coachella Valley Storm Water Channel (CVSC) and the Salton Sea.

Response: Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Coachella hydrologic subunit, the groundwater basin within which the project is proposed, are: municipal and domestic water supply; industrial service supply; and agriculture supply. The impact of the proposed IWA Recycled Water Project and groundwater quality is evaluated under Issue a. of this Subchapter. The analysis of potential groundwater impacts conducted for the project (THC, 2011) indicates that the recharge water will be superior in quality to the native groundwater, and as such will have no adverse impacts on the beneficial uses of the groundwater in the basin.

Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Coachella Valley Stormwater Channel are freshwater replenishment; warm freshwater habitat; wildlife habitat; protection of rare, threatened or endangered species, and contact and non-contact water recreation (although recreation uses are listed as unauthorized uses). Beneficial uses identified in the RWQCB 2006 Colorado River Basin Plan for the Salton Sea (to which the Coachella Valley Stormwater Channel is tributary) are aquaculture; contact and non-contact water recreation; warm freshwater habitat; wildlife habitat; protection of rare, threatened or endangered species, and potentially for industrial service supply. The potential impacts of the proposed project on the biological habitat-related beneficial uses of the effected waterways is addressed in Section 4.3 Biological Resources of this document and was found to be a less than significant impact based on continue discharge of up to 0.5 MGD of treated effluent per day.

USGS gauges provide historical data that Channel flows upstream of VSD are 2,700 AF/yr and flows near the Salton Sea are 79,000 AF/yr. VSD WWTP discharges approximately 7,000 AF/yr of treated effluent. The VSD effluent accounts for less than 10% of the Channel contribution to the Salton Sea, which is only one of many surface and subsurface waters that flow to the Sea, a volume of inflow estimated at 1,346,000 AF/yr (Tetra Tech 2000 as cited in THC, 2009.) As proposed, reduction in VSD effluent discharged to the Channel could result in a reduction of less than ½ of 1% of the total flow in the Sea and would not have

an impact on beneficial uses of the Salton Sea with the possible exception of water quality related impacts.

According to the Basin Plan, the Salton Sea water quality is primarily constrained by rising salinity, which adversely impacts spawning of the recreationally important fisheries that have been introduced into the Sea from the Gulf of California. The salinity levels of the Salton Sea are already near or exceed the levels at which the fisheries are adversely impacted, and salinity levels in the Sea will continue to rise because inflow is primarily high salinity agricultural flows and there is no outflow from the Sea other than by evaporation. While the reduction in VSD effluent would constitute a very small percentage of flow reduction into the Sea, the reduced VSD flows would contribute to a cumulative decrease in total flows into the Sea that has the potential to increase salinity levels more rapidly than would otherwise occur. The Basin Plan identifies several alternatives that could mitigate rising salinity levels and thereby perpetuate the fisheries that have been developed and identified as beneficial uses.

The Basin Plan states that "wastewater reclamation and reuse is encouraged by this Regional Board."

Comment: The RWQCB cites Code that requires that any change in the point of discharge, place of use or purpose of use of treated wastewater associated with implementation of the proposed project be approved by the Division of Water Rights of the RWQCB.

Response: Any change in the point of discharge, place of use or purpose of use of treated wastewater associated with implementation of the proposed project will be submitted to the Division of Water Rights of the RWQCB for approval.

Department of Public Health

Comment 1: The Department of Public Health (DPH) summarized the proposed project.

Response: Your summary of the proposed project is accurate.

Comment 2: The DPH further summarized the proposed project, and stated that DPH has standards for regulatory, engineering, design, operational and administration of the proposed recycled water project.

Response: IWA will develop and implement its recycled water program according to the DPH's regulatory, engineering, design, operational and administrative requirements for the protection of public health.

Comment 3: The DPH has regulations and requirements for different wastewater treatment systems that are in Title 22 as well as guidance and professional organization documents.

Response: IWA will develop and implement its wastewater treatment systems in accordance with DPH's regulatory requirements iterated in Title 22 or other regulatory documents.

Comment 4: The DPH recognizes that the requirements for complying with its regulations regarding recycled water are complex and require extensive planning. Draft regulations are provided and assistance is offered in assuring compliance with the regulatory requirements.

Response: IWA has received the *Groundwater Recharge Reuse, DRAFT Regulation, August 5, 2008* document and will reference the document and work closely with the DPH while developing and implementing its recycled water program to ensure the protection of public health.

This concludes the analysis and discussion of potential impacts from implementing the IWA Recycled Water Project.

4.5.5 Mitigation Measures

Based on the analysis in Section 4.5.4 of hydrology and water quality impacts, the following mitigation measures are recommended for implementation. Note that the discussion of regulatory requirements for monitoring groundwater associated with groundwater recharge required monitoring and these requirements are not reiterated in this discussion of mitigation measures.

4.5-1 ***The construction contractor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices that will be implemented to prevent construction pollutants from contacting stormwater with the intent of keeping all products of erosion from moving offsite. The SWPPP shall be developed with the goal of achieving a reduction in pollutants both during and following construction to control urban runoff to the maximum extent practicable based on available, feasible best management practices. The SWPPP and the monitoring program for the construction projects shall be consistent with the requirements of the latest version of the State's General Construction Activity Storm Water Permit and NPDES Permit No. CAS000002, Order No. 2010-0014-DWQ.***

The following items or comparable BMPs shall be included in the SWPPP:

- ***The length of trenches which can be left open at any given time should be limited to that needed to reasonably perform construction activities. This will serve to reduce the amount of backfill stored onsite at any given time.***
- ***Backfill material should not be stored in areas which are subject to the erosive flows of water.***
- ***Measures such as the use of straw bales, sandbags, silt fencing or detention basins shall be used to capture and hold eroded material for future cleanup.***
- ***Rainfall will be prevented from entering material and waste storage areas and pollution-laden surfaces.***
- ***Construction-related contaminants will be prevented from leaving the site and polluting waterways.***
- ***Replanting and hydroseeding of native vegetation will be implemented to reduce slope erosion and filter runoff.***
- ***A spill prevention control and remediation plan to control release of hazardous substances.***

4.5-2 The site design for IWA Recycled Water Project facilities shall prepare and implement a Water Quality Management Plan (WQMP) which specifies Best Management Practices that will be implemented to prevent long-term surface runoff from discharge of pollutants from sites on which construction has been completed. The WQMP shall be developed with the goal of achieving a reduction in pollutants following construction to control urban runoff pollution to the maximum extent practicable based on available, feasible best management practices.

4.5-3 Any future IWA Recycled Water Project facilities that will be installed at a location where flood hazards may occur must be hardened to withstand the defined flood hazard so that the facility can continue to operate or be available to be placed into immediate operation following the flooding.

4.5-4 For long-term mitigation of site disturbances at IWA Recycled Water Project facility locations, all areas not covered by structures shall be covered with hardscape (concrete, asphalt, gravel, etc.), native vegetation and/or man-made landscape areas (for example, grass). Revegetated or landscaped areas shall provide sufficient cover to ensure that, after a two year period, erosion will not occur from concentrated flows (rills, gully, etc.) and sediment transport will be minimal as part of sheet flows.

4.5-5 Within each facility or project associated with the IWA Recycled Water Project that will impact more than one acre, surface runoff from upstream shall be collected and discharged in a manner downstream of the site that does not increase downstream flood hazards. Onsite surface runoff shall be collected and retained (for use onsite) or detained and percolated into the ground on the site such that site development results in no net increase in offsite stormwater flows. Detainment shall be achieved through Low Impact Development techniques whenever possible, and shall include techniques that remove the majority of urban storm runoff pollutants, such as petroleum products and sediment. The purpose of this measure is to remove the onsite contribution to cumulative urban storm runoff and ensure the discharge from the sites is treated to reduce contributions of urban pollutants to downstream flows and to groundwater. If it is not possible to eliminate stormwater flows from leaving a site, the facility shall not be constructed until a drainage study has been conducted that verifies that there will be no adverse impacts to downstream stormwater management from implementation of the site development.

Although the analysis in the DEIR did not identify potential for significant impacts to groundwater resources in the Indio Subbasin, the following measures are identified as contingency measures to be brought forward if the modeling analysis provided (THC, 2011) does not reflect actual future conditions.

4.5-6 Under no circumstance shall discharge of recycled water cause or contribute to a cumulative violation of the Basin Plan maximum benefit objectives or interfere with a designated beneficial use for a water or groundwater body. In addition to monitoring, the IWA will use models to forecast future TDS and Nitrate concentrations pursuant to the Basin Plan and Title 22 permit requirements. IWA will, based on monitoring, begin the planning to develop measures to either protect beneficial uses of groundwater or to treat groundwater to meet beneficial use requirements if a violation appears imminent.

4.5-7 All water recharge operations shall be monitored, and if impacts that were not forecast to occur as a result of recycled water recharge operations cause unexpected significant adverse impact on the groundwater aquifer, the recharge operations shall be terminated or modified to eliminate the adverse impact.

With implementation of the above mitigation measures the potential adverse water quality impacts from implementing the IWA Recycled Water Project can be controlled to a less than significant impact level.

4.5.6 Cumulative Impact

Based on the evaluation contained in this subchapter, implementation of the proposed project is not forecast to cause any cumulatively considerable adverse environmental impacts on hydrology and water quality resource issues with implementation of the required mitigation measures. The use of recycled water with some return to the Indio Subbasin groundwater aquifer is forecast to benefit groundwater resources, and it is not forecast to cause a cumulatively considerable adverse change in groundwater quality in the areas where it may be utilized. Because proposed project will be required to implement the above measures and comply with low impact development requirements of the Regional Board's MS4 permits, future projects implemented under the Subregional WRP Project are not forecast to substantially increase stormwater runoff within the project area or cause significant degradation of surface water quality. The findings of the cumulative evaluation provided in the The Water Balance Study (THC, 2009) and the Evaluation of Potential Groundwater Impacts (THC, 2011) indicate that the proposed recycled water management activities will not cause a cumulatively considerable, or significant adverse impact to the groundwater resources of the Indio Subbasin if managed in accordance with the assumptions and mitigation measures outlined in this Subchapter of the DEIR.

4.5.6 Unavoidable Adverse Impacts

Implementing the proposed IWA Recycled Water Project is not forecast to cause any direct or indirect significant adverse hydrology or water quality impacts with implementation of the required mitigation measures and the contingency measures, if required. The proposed project would have a positive impact on the aquifer both because it would reduce the degree of overdraft that the aquifer would otherwise experience and because the recycled water injected into the aquifer would be of a superior quality to the native groundwater. Long-term (permanent) changes in storm flows at IWA Recycled Water Project facility sites would be controlled to a less than significant level.

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4.6 NOISE

4.6.1 Introduction

The purpose of the IWA Recycled Water Project is to produce recycled water that can be used for landscape irrigation and/or groundwater recharge of the underlying aquifer. The proposed project would provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area.

This section of the DEIR focuses on the assessment of potential noise impacts on the environment resulting from the implementation of the project. Implementation of the proposed project could result in increased noise levels over both the short and long term. Short-term noise increases will be caused by construction activities and the long-term noise increases could be associated with facilities and operational activities in support of the IWA Recycled Water Project.

No substantive comments with respect to noise were received on the NOP or at the scoping meeting held for the project.

4.6.2 Noise Characteristics

Noise is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is easily measured with instruments, but the human variability in subjective and physical responses to sound complicates the understanding of its impact on people. People judge the relative magnitude of sound by subjective terms such as “loudness” or “noisiness.”

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The unit of sound pressure ratioed to the faintest sound detectable by a keen human ear is called a decibel (dB), and is the standard unit of measurement of the loudness of sound. Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquake intensity. In general, a 1 dB change in the sound pressure levels of a given sound is detectable only under laboratory conditions. A 3 dB change in sound pressure level is considered a "just detectable" difference in most ambient situations. A 5 dB change in sound pressure is readily noticeable and a 10 dB change is considered a doubling (or halving) of the subjective loudness.

A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against the very low and high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear. A-weighted sound pressure levels are the standard noise representation in California for planning purposes.

Examples of the decibel level of various noise sources (instantaneous single noise event) include the quiet rustle of leaves (10 dBA), a library (35 dBA), ambient noise outdoors (50 dBA), normal conversation at 5 feet (55 dBA) or a busy street at 50 feet (75 dBA).

Because sound or noise can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale similar to the Richter scale used for earthquake magnitude is used to keep sound intensity values at a convenient and understandable level. Various acoustical scale and units of measurement have been developed such as: equivalent sound levels (Leq), day-night average sound levels (Ldn) and community noise equivalent level (CNEL).

Equivalent sound levels are not measured directly but rather calculated from sound pressure levels typically measured in dBA. The Leq is the constant level that, over a given time period, transmits the same amount of acoustic energy as the actual time-varying sound. Equivalent sound levels are the basis for both the Ldn and CNEL scales. It can be envisioned as all of the sound energy over a discrete period of time averaged over that period.

Ldn value is a measure of the cumulative noise exposure of the community at a given location. The Ldn value results from a summation of hourly Leq's over a 24-hour time period with an increased weighting factor applied to the nighttime period between 10:00 p.m. and 7:00 a.m. This noise rating scheme takes into account those subjectively more annoying noise events which occur during the normal sleeping hours. Ldn was adopted by the United States Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure.

CNEL is also a measure of the cumulative noise exposure of the community at a given location and it also incorporates a weighting penalty for noises that occur during the nighttime hours. In addition, CNEL levels include a penalty for noise events that occur during the evening hours between 7:00 p.m. and 10:00 p.m. Because of the weighting factors applied, CNEL values at a given location will always be slightly larger than Ldn values, which in turn will exceed Leq values. However, CNEL values are typically within one decibel of the day-night average sound level. The predominant community noise rating scale used in California for land use compatibility assessment is the CNEL.

4.6.3 Sensitive Receptors

Sensitive noise receptors are generally considered to be residences, schools, health care facilities, hotels/motels, churches, libraries, or passive parks. Residential uses are particularly sensitive to nocturnal (night-time) noise intrusion that might be associated with construction, operational, or vehicle traffic. Schools similarly could be affected by daytime noise sources.

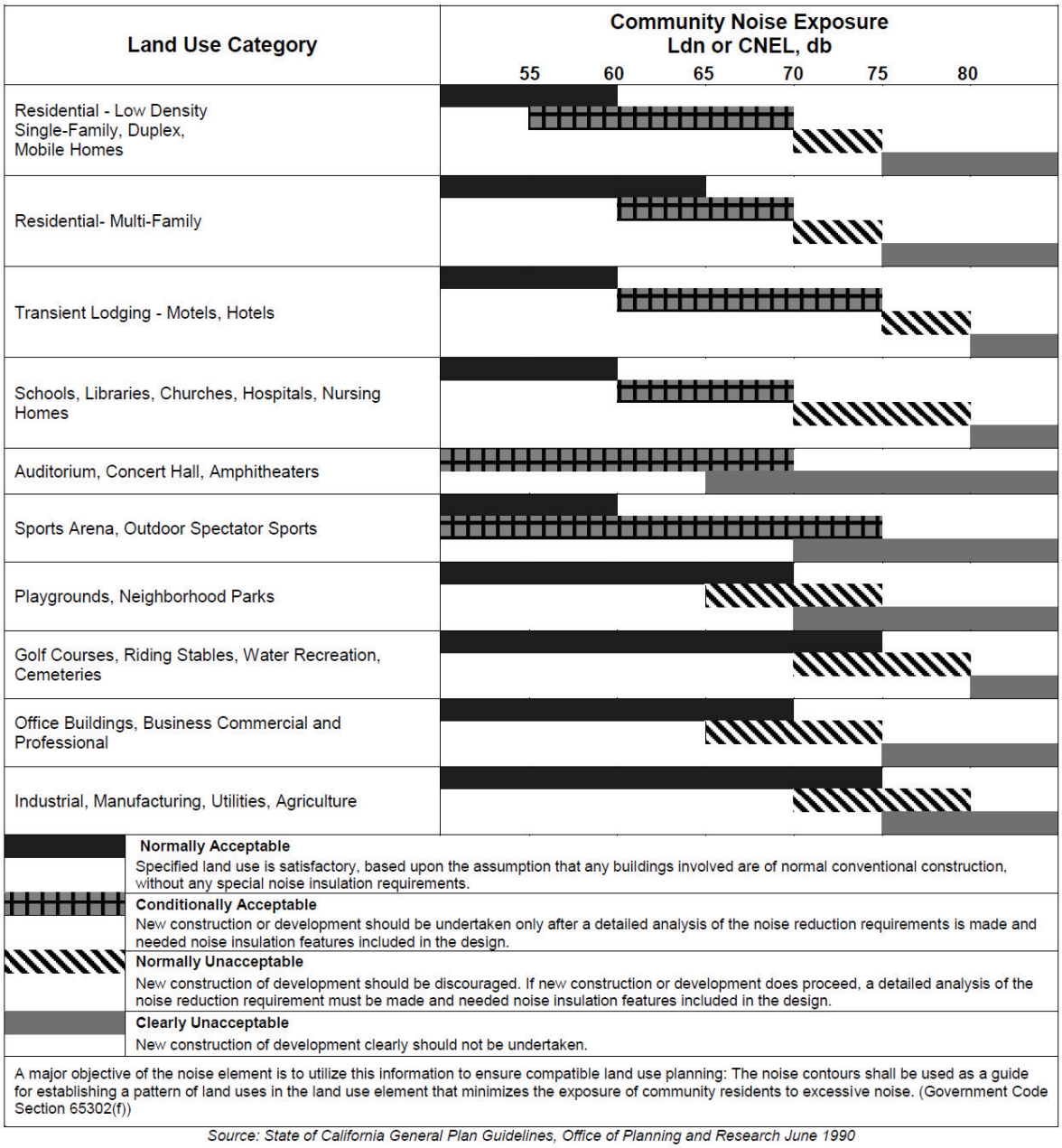
4.6.4 Noise Standards

Noise standards are differentiated between those based upon whether a local jurisdiction has the legal authority to directly regulate the source of the noise, or if that authority is pre-empted by state or federal regulations that have the authority to regulate the source of noise. Transportation source noise generation (on-road vehicles, aircraft, trains, etc.) are federally regulated; thus, local jurisdictions decide on the patterns of land use that may be exposed to given levels of noise, but they do not have the authority to impose noise performance standards on the sources themselves.

The State of California has established guidelines for acceptable community noise levels that are based on the CNEL rating scale. The guidelines rank noise land use compatibility in terms of "normally acceptable", "conditionally acceptable", and "clearly unacceptable" noise levels for

various land use types. As shown in Figure 4.6-1, Land Use Compatibility for Community Noise Exposure, single-family homes are "normally acceptable" in exterior noise environments up to 60 dB CNEL and "conditionally acceptable" up to 70 dB CNEL based on this scale. Multiple family residential uses are "normally acceptable" where exterior noise levels are 65 dB CNEL or less and "conditionally acceptable" where they are 70 CNEL or less. Schools, libraries and churches are "normally acceptable" where exterior noise levels are 70 dB CNEL or less, as are office buildings and business, commercial and professional uses.

FIGURE 4.6-1
Land Use Compatibility for Community Noise Environments



Source: State of California General Plan Guidelines, Office of Planning and Research June 1990

Title 24 of the California Code of Regulations, as amended, requires that indoor noise levels in habitable rooms of all residential occupancy be limited to a 45 dB CNEL. Normal noise attenuation within residential structures with closed windows is about 20dB, therefore an exterior noise level of 65 dBA CNEL will meet the interior standard without any specialized measures. A noise level of 65 dBA CNEL is usually also the level at which noise begins to interfere with the ability to carry on a normal conversation at a reasonable distance without raising one's voice. Both in order to provide usable outdoor locations where noise is not excessively intrusive, and in order to meet interior standards with no additional measures other than window closure, a noise exposure standard of 65 dBA CNEL is commonly required in most California jurisdictions for any noise-sensitive land uses.

The standard for less sensitive land uses, such as commercial uses, is generally less stringent. Noise levels up to 65 dB are considered "conditionally acceptable" for offices and business commercial land uses.

While the Noise Standard guidelines apply to mobile transportation noise sources, stationary equipment noise crossing the boundary of adjoining land uses is generally regulated by local ordinance because no state or federal preemption exists for such sources. The City of Indio Municipal Code does not designate numerical thresholds of acceptable noise levels, but rather includes the following regulation.

§ 95C.03 GENERAL PROHIBITIONS.

(A) It shall be unlawful for any person to make, continue, or cause to be made or continued, within the city limits or within 200 feet thereof, any disturbing excessive or offensive noise or vibration which causes discomfort or annoyance to any reasonable person of normal sensitivity in the area or that is plainly audible at a distance greater than 50 feet from the source point for any purpose.

Construction noise is typically governed by ordinance limits on allowable times of equipment operations. CEQA Appendix G guidelines state that if an impact is regulated by a rule or regulation specifically designed to control a given type of impact (such as construction noise), then compliance with that rule may be used in substantiation of a finding that the impact is less-than-significant. Construction noise impacts therefore will be less-than-significant if they comply with the applicable ordinance limits.

The Indio Municipal Code restricts the hours of construction operation. During Pacific Standard Time, construction noise is restricted from 6:00 p.m. to 7:00 a.m. weekdays, from 6:00 p.m. to 8:00 a.m. Saturdays, from 5:00 p.m. to 9:00 a.m. on Sundays or holidays. During Pacific Daylight Time, construction noise is restricted from 6:00 p.m. to 6:00 a.m. weekdays, from 6:00 p.m. to 7:00 a.m. Saturdays, from 5:00 p.m. to 9:00 a.m. on Sundays or holidays.

The City of La Quinta designates numerical thresholds of acceptable noise levels, as is detailed in Table 4.6-1.

Table 4.6-1
CITY OF LA QUINTA MAXIMUM NOISE LEVELS AT RECEIVING PROPERTY

	Noise Sensitive (Residential, schools, hospitals and churches)(dBA)	Not Noise Sensitive (Other Non-Residential)(dBA)
7:00 a.m. to 10:00 p.m.	60	75
10:00 p.m. to 7:00 a.m.	50	65

Exemptions to the La Quinta Noise Standards include construction activities regulated by Section 6.08.050 of the La Quinta Municipal Code which regulates the hours of construction operation unless an exception is issued by the city manager. Between October 1st and April 30th, construction noise is restricted from 5:30 p.m. to 7:00 a.m. weekdays, from 5:00 p.m. to 8:00 a.m. Saturdays and completely restricted on Sundays and Holidays. (Specific days included as holidays are stated in the code.) Between May 1st and September 30th, construction noise is restricted from 7:00 p.m. to 6:00 a.m. weekdays, from 5:00 p.m. to 8:00 a.m. Saturdays and completely restricted on Sundays and Holidays.

For the portion of the project located within unincorporated Riverside County, Ordinance 847 exempts private construction projects located one-quarter mile or more from an inhabited dwelling and private construction within one-quarter mile provided that:

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September; and

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

The Ordinance also exempts facilities owned or operated by or for a governmental agency.

4.6.5 Environmental Setting

The project area is located in a fully developed urban/suburban setting in the Coachella Valley. The project area of impact is located within the City of Indio with small pipeline segments proposed within the City of La Quinta and within an unincorporated portion of the County. Most of proposed infrastructure would be located within existing roads, parking lots or wastewater treatment compounds, although a few undeveloped fields and a dirt access road are also present within the proposed project area of impact. Four City of Indio or IWA-owned sites located along or north of 42nd Avenue are currently under consideration for the proposed satellite treatment facility site. Posse Park is one of the possible sites, with another parcel located immediately north of Posse Park across a channel and the two remaining parcels located on the south and east sides of Indio Municipal Golf Course. All four sites are vacant and located within mixed residential and recreational use lands. Please refer to Figure 3-1 for a regional location map and Figure 3-2 for a map depicting the City of Indio boundaries and VSD facility locations.

As described in the project description, the proposed IWA Recycled Water Project facilities would be located within areas developed with a mix of residential, commercial, recreational and vacant land uses. The Bermuda Dunes Airport is located west of the northernmost portion of the proposed project area of impact.

4.6.6 Environmental Impacts

The proposed project's potential to generate noise was included in this DEIR based on the potential for specific projects to cause short-term and long-term changes in the noise environment within and surrounding the proposed project locations. Short-term noise increases could result from construction activities and the long-term noise increases could be associated with the operation of the future site-specific projects.

4.6.6.1 Thresholds of Significance

According to the current CEQA Appendix G guidelines, noise impacts are considered potentially significant if they cause:

a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Noise levels exceeding the City of Indio, the City of La Quinta, the County of Riverside or applicable State Noise Standards would be considered significant.

b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Two characteristic noise sources are typically identified with a project such as the proposed facilities: construction activities, especially heavy equipment, which will create short-term noise increases near each project site, and project-related operational noise, which may impact the closest sensitive receptors.

Construction noise is governed by ordinance limits on allowable times of equipment operations. The Cities of Indio and La Quinta and the County of Riverside limit the hours of construction operation as noted in Section 4.6.4 Noise Standards above.

4.6.6.2 Project Impacts

Would the project result in the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction Noise
Implementation of the project will generate noise. Grading, construction and well drilling equipment can generate noise levels ranging between 70 and 96 dBA at a distance of 50 feet from the equipment. Earth-moving equipment could include excavators, backhoes, tractors, dump

trucks, scrapers, and front loaders. The most intensive earth-moving would occur during ground preparation for reservoirs, although none are proposed at this time. The specific project proposed for current implementation as part of the IWA Recycled Water Project would require only minimal earth moving. Engine-powered materials-handling equipment expected to be used includes cranes, concrete mixers, and concrete pumps. Theoretical noise levels from materials-handling equipment at 50 feet range from about 76 to 88 dB. If several pieces of such equipment are operating in very close proximity, their noise impacts are additive. For three major pieces of highly mobile equipment in simultaneous and co-located operation, their theoretical combined noise level is 85 dB. Monitored construction noise near construction projects have generally produced hourly average noise levels in the high 70 dB Leq range at a 50-foot reference distance. Heavy equipment operations within 125 feet of an occupied home may interfere with normal enjoyment of the outdoor area of a home.

Stationary equipment which could be used during construction activities may include generators, pumps, well-drilling equipment and air compressors. Typical noise levels at 50 feet range from 69 to 96 dB. Well-drilling equipment is the only equipment possibly needed for a 24-hour operation.

During the period of construction, noise levels would be increased over that of the ambient noise levels intermittently when the equipment is operating. The increased noise levels will not be severe enough to pose a health or hearing hazard, but could be considered a short-term nuisance. The construction of the proposed project may exceed noise standards at the exterior location of some residences, depending on the background noise levels at the construction and receptor locations. This increase in noise levels will be intermittent while different phases of the project are being constructed. The temporary increase in noise exposure would cease immediately at the completion of construction. The increase in noise levels from most of these activities will occur during the less noise sensitive daylight hours when background sound levels are already high due primarily to traffic.

As stated in Section 4.6.4 Noise Standards above, most jurisdictions do not require construction noise to be mitigated to the specific threshold levels because construction noise is temporary. However, jurisdictions do require operational considerations (i.e., limitation of construction hours, the muffling of construction equipment, noise complaint response programs, etc.) to minimize noise impacts during the construction process. Construction noise levels affecting sensitive receptors may exceed the significance thresholds during the day, but eliminating this source of noise at night can reduce these short-term impacts to a non-significant level.

Drilling of the ASR wells would have the potential to have the greatest short-term noise impact, both because of the noise levels generated by the drilling equipment and because wells must be constructed continuously once initiated, thus occurring during the more noise sensitive nighttime hours. As ASR well locations have not been selected, the proximity of well sites to sensitive receptors is not known. However, mitigation measures 4.6-4 and 4.6-9 provided below can reduce the short-term noise impacts from well drilling to a less than significant level.

Mitigation measures are identified below which can ensure that construction activities do not intrude on sensitive receptors in the evening or expose such receptors to damaging levels of noise at any time. The most effective method of controlling construction noise is generally by limiting construction hours to normal weekday working hours, typically from daylight to dusk, or in this case, complying with the applicable City or County noise ordinance construction hours detailed in Section 4.6.4 above. With implementation of the mitigation measures provided

below, short-term construction activities are not forecast to cause significant adverse noise impact.

Operational Noise

Tertiary treatment facilities will be located within structures that attenuate noise. In addition, to protect plant workers from hearing damage, loud indoor noise sources are often shrouded or individually enclosed and sound absorption panels are installed on walls and ceilings. Noise levels outside enclosed treatment processes are typically 45-50 dB in close proximity to the building. The existing treatment facility is located within an industrial area where no sensitive noise receptors exist, however future satellite treatment facilities may be located adjacent to sensitive uses and mitigation is identified in Section 4.6.7 to address potential permanent noise impacts from operation of such facilities.

Exposed pumps without any attenuation barrier can create noise levels of 66 dB at 10 feet from the pump. Noise from stationary sources typically attenuates at a rate of 6 dB for each doubling of distance. With geometric spreading losses, the La Quinta nocturnal noise standard of 50 dB for sensitive land uses would be met at 80 feet from the pump. The less stringent State of California code standard of 65 dB would be met at 20 feet. The City of Indio does not have numerical noise standards, but adequate set-back is anticipated for facilities that would be installed within existing wastewater treatment facilities and at new facility locations as to not exceed significance thresholds for any exposed pump. Mitigation is incorporated to ensure that operational noise impacts are less than significant.

The operation of an emergency generator can create noise levels of 60 dB at 58 feet from the unit. Careful placement of the emergency generator at the greatest distance possible relative to the closest neighbors or blocked as thoroughly as possible by structures can be used to reduce possible audibility during testing or during power outages.

Booster station pumps will be located within structures designed to attenuate sounds. Measurements at typical facilities show noise levels of less than 50 dB at 50 feet. The enclosed generator will operate for periodic testing and during power outages. Measurements have typically shown 65 dB at 50 feet on units with a side with louver and exhaust pipe. The noise ordinance standards could be exceeded at the nearest residence if they faced the louver or exhaust sides of the generator room. In order to achieve a less-than-significant noise level from the back-up generator, mitigation measure 4.6-5 is incorporated.

The proposed mitigation measures in Section 4.6.7 are considered adequate to reduce noise impacts to a less than significant impact level because design or structural measures to attenuate noise can and will be implemented to meet the applicable City, County or State external and internal noise standards.

Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction activities would increase groundborne vibration periodically. However, the periods of increase would be of short duration and only occur during daylight hours. The on-site construction equipment that will briefly create the maximum potential vibration is a large bulldozer. The stated vibration source level in the FTA Handbook for such equipment is 87 VdB at 25 feet from the source. By 200 feet the vibration level dissipates to 69 VdB, or below the

annoyance threshold. Vibration levels are not expected to exceed either the potential nuisance threshold or the building damage threshold.

Mitigation measures for the noise impacts from construction equipment are included in Section 4.6.7 and are adequate to reduce the impacts of groundborne vibration to less than significant.

Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Under normal operating conditions the noise levels generated by the facilities required to support the IWA Recycled Water Project are not expected to increase the ambient noise levels to a level of significance that would impact sensitive receptors.

The operation of ASR wells is a fairly passive source of noise generation. Once installed, ASR wells, which recharge water by gravity flow, are not forecast to exceed the sound levels of surrounding activities, such as traffic or urban activities (typically about 55 dB) from children playing, music, or gardening activities.

The operation of booster pumps can generate noise levels greater than the 60-65 dBA CNEL values that are generally considered acceptable for noise sensitive uses. Sound attenuation structures are available to reduce sounds from booster pumps to levels well within the significant noise impact thresholds, including those noise levels protective of sleep during nighttime hours. Mitigation is provided in Section 4.6.7 to ensure that future booster pump noise is reduced below a significance threshold in each of the affected communities.

Finally, modifications to treatment facilities can increase local noise levels from operation of pumps and other equipment. The existing treatment facility is located within an industrial area where no sensitive noise receptors exist, however future satellite treatment facilities may be located adjacent to sensitive uses and mitigation is identified in Section 4.6.7 to address potential permanent noise impacts from operation of such facilities.

Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

As outlined above, this project is forecast to have a temporary impact on ambient noise levels during construction. Incorporation of the mitigation measures set forth in Section 4.6.7 are considered adequate to reduce the temporary and periodic noise impacts to ambient noise levels to a less than significant level.

For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport of public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The 12-inch pipeline along Madison Street that would supply recycled water to the Shadow Hills Golf Course would run along the boundary of the Bermuda Dune Airport Policy Area. A portion of Safety Zone Area 1 extends to the edge of the Policy Area, and there is potential for a small segment of the pipeline to be installed within the boundaries of the Safety Zone Area 1. However, according to Figure 5 of the Western Coachella Valley Area Plan of the Riverside County General Plan, the 60 CNEL contour line from the airport does not reach the edge of the Policy Area. Because the area within which the pipeline would be installed is located outside of

the 60 CNEL noise, no adverse noise impact from proximity to the Bermuda Dune Airport is forecast to occur for project implementation.

The only other public airport in the general vicinity of the project area is the Palm Springs International Airport. Review of the Riverside County Airport land use Compatibility Plan Policy Document (Adopted March 2005) indicates that all of the proposed project area of impact is far outside of the 60 CNEL contours for the Palm Springs International Airport.

The project would not expose people residing or working in the project area to excessive noise levels with respect to public airports.

For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The project site is not within the noise zone of any private airport. Thus, no adverse impact can occur.

4.6.7 Mitigation Measures

The mitigation measures listed below shall be implemented to reduce temporary noise impacts associated with construction.

4.6-1 ***Construction shall be limited to the hours of 7 a.m. to 7 p.m. on Monday through Friday, and between 9 a.m. to 6 p.m. on Saturday, and shall be prohibited on Sundays and federal holidays, or as defined in local noise ordinances. Exceptions are for well drilling or declared emergency circumstances.***

4.6-2 ***All construction vehicles and fixed or mobile equipment shall be equipped with properly operating and maintained mufflers.***

4.6-3 ***All employees that will be exposed to noise levels greater than 75 dB over an 8-hour period shall be provided with adequate hearing protection devices to ensure no hearing damage will result from construction activities.***

4.6-4 ***If equipment is being used that can cause hearing damage at adjacent noise receptor locations (distance attenuation shall be taken into account), portable noise barriers shall be installed that are demonstrated to be adequate to reduce noise levels at receptor locations below hearing damage thresholds.***

4.6-5 ***All production lift stations, booster pumps or other facilities shall have their noise levels attenuated to 50 dBA CNEL at the adjacent property boundary, when noise sensitive uses occur on such property, or in accordance with a local noise ordinance.***

4.6-6 ***When possible, construction shall utilize methods or equipment that will provide the lowest level of noise impact, i.e., use newer equipment that will generate lower noise levels.***

4.6-7 ***Efforts shall be made to maintain good relations with the local community where construction is scheduled, such as keeping people informed of the schedule, duration, and progress of the construction, to minimize the public objections of unavoidable noise. Communities should be notified in advance of the construction and the expected temporary and intermittent noise increases during the construction period.***

4.6-8 ***Construction staging areas shall be located as far from adjacent sensitive receptor locations as possible at each facility.***

4.6-9 The IWA will establish a noise complaint/response program and will respond to any noise complaints received for this project by measuring noise levels at the affected receptor. If the noise level exceeds an Ldn of 65 dBA exterior or an Ldn of 45 dBA interior at the receptor, the applicant will implement adequate measures to reduce noise levels to the greatest extent feasible, including portable noise barriers or scheduling specific construction activities to avoid conflict with adjacent sensitive receptors.

With implementation of the above mitigation measures, all potential adverse impacts to the existing noise environment can be controlled or reduced to a less than significant impact level.

4.6.8 Cumulative Impacts

Under normal operating conditions the noise levels generated by the facilities required to support the IWA Recycled Water Project are not expected to increase the ambient noise levels to a level of significance that would impact sensitive receptors. Cumulative noise levels in the project area will likely increase over time as the project area is built-out in accordance with applicable general plans. The implementation of the IWA Recycled Water Project does not constitute a significant or cumulatively considerable contribution to these cumulative increases in the noise environment. Therefore the cumulative noise impacts from the proposed project are considered less than significant.

4.6.9 Unavoidable Adverse Impacts

The noise evaluation presented above indicates that the proposed project does not have the potential to cause potentially significant and unavoidable adverse noise impacts from implementing the IWA Recycled Water Project. As described above, mitigation measures have been identified that can reduce both short-term and permanent noise impacts below a significant level. Noise conditions will be unavoidably altered by implementation of the proposed project, in both the short- and long-term, but this change in noise condition is not forecast to result in significant adverse impacts with implementation of mitigation measures listed above. Thus, sound levels, noise, will experience a small unavoidable adverse increase in noise, but this increase will not reach a level of significant unavoidable adverse noise impact.

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CHAPTER 5 – ALTERNATIVES

5.1 INTRODUCTION

The California Environmental Quality Act (CEQA) and the State CEQA Guidelines require an evaluation of alternatives to the proposed action. The purpose of the alternatives evaluation under CEQA is to determine whether one or more feasible alternatives is capable of reducing potentially significant impacts of a preferred project to a less than significant level. The applicable text in the State CEQA Guidelines occurs in Section 15126 as follows:

Section 15126.6(a): Alternatives to the Proposed Project. An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation.

Section 15126.6(b) Purpose. Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives or would be more costly.

The project evaluated in this EIR is the IWA proposal to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City of Indio and for possible groundwater recharge of the underlying aquifer.

One of the alternatives that must be evaluated is the “no project alternative,” regardless of whether it is a feasible alternative to the Project, i.e., would meet the project objectives or requirements. Under this alternative, the environmental impacts that would occur if the Project is not approved and implemented are identified. In addition to the no project alternative, a location alternative is often appropriate to incorporate. However, given that the proposed project is the advanced treatment of wastewater and provision of recycled water for large-scale irrigation and groundwater recharge, alternative locations are not readily available. The tertiary treatment facilities for irrigation must be located within the VSD facility because that is where the first stages of wastewater treatment occur and because there is room within the existing compound to accommodate the additional facilities necessary for tertiary treatment. Any alternative location for tertiary treatment would likely increase the impacts associated with the project because treated effluent would have to be conveyed to a new location for tertiary treatment, and both the conveyance and the site disturbance effects at an alternative locations would have greater impacts than would occur by co-locating the tertiary treatment with the existing treatment facilities. Alternative pipeline routes would only be reasonable to consider to the extent that the alignments reach the sites where the large-scale irrigation demands occur. Several alternative pipeline routes and satellite treatment facilities are already included in the document for consideration.

The California Supreme Court determined that examination of infeasible alternatives need not be given exhaustive evaluation. Specifically the court case Citizens of Goleta Valley v. Board of Supervisors, 1988 the court stated:

[A] project alternative which cannot be feasibly accomplished need not be exhaustively considered. A feasible alternative is one which can be accomplished in a successful manner within a reasonable period of time, taking into account economic, legal, social and technological factors [Citations.] Surely whether a property is owned or can reasonably be acquired by the project proponent has strong bearing on the likelihood of a project's ultimate costs and the chances for an expeditious and successful accomplishment.

The State CEQA Guidelines, Section 15126.6(f)(1) state: *Feasibility. Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of alternatives.*

The Supreme Court ruled that it is not necessary to consider alternative locations when a proposed project is being developed in accordance with a jurisdiction's planning framework, such as the IWA Water Master Plan Update and Urban Water Management Plan Addendum , both of which identify reclaiming wastewater from VSD in projected water supplies. Within the context of Section 15126.6(f)(1), the location of tertiary treatment facilities at the VSD facilities achieves consistency with IWA water planning documents and meets the objectives for the proposed project. Therefore, no alternative location for the tertiary treatment facilities will be analyzed in this document because it is not considered a reasonable or feasible alternative to the proposed project.

From the IWA's perspective, the proposed project fulfills the objectives outlined in the IWA Water Master Plan Update and Urban Water Management Plan Addendum by implementing source substitution that diversifies water supply options and reduces reliance on groundwater. Because both Plans rely upon the availability of recycled water from VSD to meet projected water demands, its implementation is deemed essential to a future adequate water supply.

The only potential unavoidable significant adverse impact identified from project implementation is the potential impact to migratory bird habitat. Since mitigation has already been identified to minimize the impact of the reduced effluent discharges on wildlife habitat, the only alternatives for reducing project-related biological impacts to below a level of significance is to not construct the project. The potential impacts of this alternative will be evaluated relative to the proposed project. Thus, the following alternative is considered in this chapter:

1. No Project (no build)

The following evaluation also includes identification of an environmentally superior alternative as required by the State CEQA Guidelines. This alternative was developed during review of the proposed project by the IWA Staff. No other alternatives were identified during the review process for consideration in this DEIR.

5.2 NO PROJECT ALTERNATIVE

The No Project Alternative would result in eliminating the activities that would convert the sites from the existing condition to the proposed recycled water facilities, ranging from treatment facilities to pipelines and wells. Under this scenario, minor grading associated with preparation of sites for satellite treatment facilities, booster stations and ASR wells would not occur and more considerable grading that might be necessary for construction of reservoirs, evaporation ponds and installation of drainage tile beneath irrigation fields would not occur. Construction of the proposed new facilities, including the tertiary treatment facilities, pipelines, satellite treatment facilities, booster stations, ASR wells, reservoirs, evaporation ponds and installation of drainage tile beneath irrigation fields would not occur. The No Project Alternative would leave all of the project sites in the existing condition. The No Project Alternative would not meet the project objectives stated in Chapter 3 and is, therefore, not considered a reasonable or feasible alternative.

Implementation of the No Project Alternative would result in the following environmental effects when compared to the proposed project.

1. Aesthetics: The proposed project aesthetic issues were evaluated in the Initial Study and were determined to have a potential to cause a less than significant adverse light and glare impacts, with mitigation included. Mitigation identifies development standards for the satellite treatment facility that ensure the facilities will not visually conflict with the character of the adjacent development. Additionally, mitigation addresses the potential for light and glare to conflict with nearby residences and the Mount Palomar Observatory. Although the new facilities would result is unavoidable changes in the landscape, the project can be implemented in conformance with the City and County's design guidelines and with specific mitigation measures that would control impacts to a less than significant negative or adverse aesthetic impact. The Initial Study concluded that with mitigation, no significant adverse aesthetic effects would result from implementing the IWA Recycled Water Project and further evaluation in the EIR was not warranted.

   The No Project Alternative would eliminate these potential nonsignificant aesthetic impacts by eliminating the site disturbance and subsequent installation of uses with increased lighting and potential for glare. The No Project Alternative would result in retaining the existing visual setting of the project sites. Thus, the No Project Alternative aesthetic effect can be considered a reduction in visual impacts relative to implementing the proposed project.

   Compared with the proposed project, aesthetic impacts that are considered nonsignificant, the No Project Alternative is considered a slightly environmentally superior alternative to the proposed project for aesthetic issues.

2. Agricultural Resources: No active agricultural activities currently occur within the project area of impact. Construction of the IWA Recycled Water Project is not forecast to have any adverse impact on adjacent land uses or land use designations. Neither alternative has a potential to adversely affect agricultural resources. The proposed project would diversify the water supply and provide for increased reliability of water supply. The more efficient use of local water resources would provide for greater stability in the availability of water that would be expected to be beneficial for agriculture. Reduced dependence of large-scale landscaping irrigation on ground and canal water would allow other users,

including agriculture, to have greater security in accessing a portion of ground and canal water supplies. Further, the proposed treatment of RO brine would include irrigation of an agricultural crop destined for animal feed, resulting in a small direct benefit to an agricultural resource.

Compared with the proposed project, the No Project Alternative is considered the environmentally inferior alternative to the proposed project for agricultural resource issues.

3. Air Quality and Greenhouse Gas: The Air Quality issue is evaluated in Subchapter 4.2 of this EIR. A short-term increase in dust and equipment exhaust will occur during construction of future proposed improvements; however, these impacts would be short-term and mitigation incorporated would reduce all air quality impacts below a level of significance. Over the long-term, operation of the IWA Recycled Water Project will increase electrical demand for treatment processing and for boosting recycled water to end users. However, the project would decrease electrical demand associated with pumping groundwater and importing water. Emissions associated with construction and operation of the proposed facilities would be well below SCAQMD CEQA significance threshold for all criteria pollutants, with or without the use of mitigation. Mitigation is proposed that further reduces potential construction impacts. The proposed project is not forecast to contribute significantly on the local or regional level to cumulatively considerable air quality impacts or result in unavoidable air quality impacts. Based upon the technical document produced for the project and presented in Subsection 4.2 Air Quality, the overall project is expected to result in a net decrease in Greenhouse Gas (GHG) emissions to meet current water demand for the project service area.

   The No Project Alternative would eliminate all of the short-term construction impacts by eliminating the need to carry out all of the construction activity. This alternative would also eliminate the electrical consumption, and associated emissions, to process and boost recycled water and would eliminate the small number of increased vehicle trips associated with an increase of approximately five employees to operate the project. However, these increases were not found to be significant. Finally, the No Project Alternative would not provide for a reduction in energy consumption and associated emissions by offsetting the need to pump as much groundwater and import as much canal water to meet current water demand, and thus would not reduce operational GHG emissions as the proposed project would. Because the No Project Alternative only eliminates insignificant short-term construction related impacts, but allows increased regional emissions associated with long distance water import, the No Project Alternative is considered environmentally inferior to the proposed project alternative for air quality issues.

4. Biological Resources: The IWA Recycled Water Project has the potential to result in a direct impact on riparian/wetland habitat by reducing the quantity of treated effluent discharged to the Coachella Valley Stormwater Channel. However, contingency measures have been identified to reduce any loss of riparian/wetland habitat associated with the Coachella Valley Stormwater Channel to a less than significant level. The IWA Recycled Water Project would also result in the constructed wetland treatment ponds becoming unnecessary for wastewater treatment. However, measures have been identified to maintain the ponds or create comparable acreage of similar habitat at another location in the vicinity. The biological resource evaluation indicates that, with implementation of appropriate mitigation measures, the IWA Recycled Water Project will not cause

any significant unavoidable adverse biological resource or land use/planning conflict impacts.

The No Project Alternative would not reduce the volume of treated effluent discharged to the constructed wetland treatment ponds or to the Coachella Valley Stormwater Channel, and would thus eliminate any potential impacts to the habitat supported by the treated effluent.

The No Project Alternative is the environmentally superior action for biological resources as it would eliminate mitigable loss of sensitive habitat.

5. Cultural Resources: The construction to be carried out for the proposed project would disturb surface and subsurface areas within the Cities of Indio and La Quinta and in unincorporated portions of Riverside County. The westernmost portion of the proposed project area of impact lies across one of the densest concentrations of prehistoric archaeological sites to be found in Riverside County. The vast majority of project impacts would occur within highly disturbed land areas where native soils have been covered with pavement and structures. However, the project will involve trenching that may expose soils below the depth of previous development even in developed areas. Several of the proposed satellite treatment facility locations are within the boundaries of known cultural sites and historic resources were found during survey of these sites.

   Testing and data recovery programs conducted as part of an archaeological monitoring program during earth-moving at the satellite treatment facility locations is required to lessen the level of impact to a less than significant level. Contingency measures are provided in the event that cultural resources are discovered at developed locations that do not require construction monitoring. Procedures have been established to require avoidance or recordation of cultural and paleontological resources and retain the knowledge that discovery and recordation of these resources will provide. Implementation of the mitigation measures serve to reduce potential unavoidable significant effects on cultural and paleontological resources to a less than significant level.

   The No Project Alternative would eliminate any disturbance of unknown cultural resources that may be buried within the project area of impact, but would also not result in any knowledge or curated artifacts that could result from the exposure of buried historic resources. The two alternatives are neutral regarding cultural resources.

6. Geology and Soils: Based on the analysis in the Initial Study and in Subsection 4.5 Hydrology and Water Quality of this DEIR, and with incorporation of the recommended mitigation, no significant adverse geology, soil or geophysical impacts would occur from project implementation. Exposure to seismic ground shaking during a major regional seismic event was determined to require mitigation to minimize potential hazards to a less than significant impact level. The new facilities that would be installed would be exposed to geotechnical hazards, particularly regional groundshaking from major seismic events, and would be constructed to meet the most recent seismic building code design requirements. The proposed groundwater recharge would inject water into the lower aquifer and would have a small positive impact on the level of the groundwater in the regional aquifer. Because the regional aquifer is in overdraft, raising the groundwater level is considered positive. The liquefaction hazards that occur in the project area are attributed to a semi-perched aquifer that is hydrologically separated from the regional

aquifer. The proposed project would not increase the liquefaction hazard in the project area.

Under the No Project Alternative the existing wastewater facilities would still be exposed to seismic ground shaking, the wastewater would just not be treated to tertiary or advanced standards. The No Project Alternative would have no impact on the potential for liquefaction in the Project Area, just as the proposed project was determined to have no impact. The two alternatives are considered to be neutral for geology and soils issues.

7. Hazards and Hazardous Materials: Hazards, hazardous materials and human health impacts associated with the proposed IWA Recycled Water Project are not forecast to be significant with implementation of mitigation identified in the Initial Study to address the potential for the spillage of petroleum products during construction and contingency mitigation that addresses the potential for encountering unknown soil contamination during construction. Based on the analysis in the Initial Study, the proposed project will not contribute to any significant adverse hazard impacts with implementation of the identified mitigation.

   The No Project Alternative would eliminate the less than significant hazards and hazardous materials impacts by eliminating the future construction activities on the project site. Even though the proposed project-related hazards and hazardous materials impacts can be mitigated to a nonsignificant level, the No Project Alternative is considered to have less hazards and hazardous materials impacts than the proposed project. Thus, the No Project Alternative is considered to be the slightly environmentally superior alternative with regard to hazards and hazardous materials.

8. Hydrology and Water Quality: Based on the evaluation contained in Subchapter 4.5 of this DEIR, implementation of the proposed project is not forecast to cause any significant adverse environmental impacts with implementation of the required SWPPP and WQMP BMPs, as well as monitoring of water quality and impacts from the recycled water application. The proposed project would meet the design standards for 100-year flows and would minimize and control discharge of pollutants during both construction and operation in accordance with current waste discharge requirements established by the Regional Board for the project area. The proposed project would install superior treatment methods for removing pollutants from effluent than currently are in place.

   The proposed project would have a positive impact on the aquifer both because it would reduce the degree of overdraft that the aquifer would otherwise experience and because the recycled water injected into the aquifer would be of a superior quality to the native groundwater. The proposed project would be consistent with both the SWRCB anti-degradation policy and the RWQCB basin plan objectives, and fulfills the objectives outlined in the IWA Water Master Plan Update and Urban Water Management Plan Addendum by implementing source substitution that diversifies water supply options and reduces reliance on groundwater. Because both Plans rely upon the availability of recycled water from VSD to meet projected water demands, its implementation is deemed essential to a future adequate water supply. No significant adverse water resource or water quality impacts are forecast to result from implementing the proposed project.

   The No Project Alternative would eliminate these potential nonsignificant hydrology and water quality impacts by eliminating the construction of the proposed facilities and

retaining the current surface water hydrology of the project sites. The No Project Alternative would also eliminate the improvements in water quality and would do nothing to curb the current state of overdraft of the aquifer or to improve the reliability of the water supply for the IWA service area. Because the proposed project hydrology/water quality impacts can be mitigated to a less than significant level, and because the proposed project includes significant improvements versus the existing hydrology/water quality impacts, the No Project Alternative is considered to be the environmentally inferior alternative with regard to hydrology and water quality issues.

9. Land Use and Planning: The land use and planning evaluation of the proposed project in the Initial Study concluded that the proposed project would not cause any significant adverse land use effects. The project does not rely on nor would it change the underlying land uses in any of the jurisdictions within the area of impact or vicinity, thus it would not have any impact on land use or planning. Under the No Project Alternative, the underlying land uses would also remain unchanged. The two alternatives are considered to be neutral for land use and planning issues.

10. Mineral Resources: The mineral resources evaluation of the proposed project in the Initial Study concluded that the proposed project would not cause any significant adverse mineral resources impacts. The proposed project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. The majority of the facilities proposed as part of the project would be located in developed areas or within roadways and limited amounts of undeveloped land. Other portions of the project would be located in close proximity to existing residential development where mining operations, if ever warranted, would conflict with adjacent land uses.

    Under the No Project Alternative, the IWA Recycled Water Project facilities would not be constructed, but the other mining constraints listed above would remain. The two alternatives are considered neutral regarding this mineral resource issues.

11. Noise: Under normal operating conditions the noise levels generated by the facilities required to support the IWA Recycled Water Project are not expected to increase the ambient noise levels to a level of significance that would impact sensitive receptors. With implementation of the mitigation to reduce construction noise and to minimize operation noise impacts through project design and siting, as well as establishment of a noise complaint/response program, the proposed project would not result in significant adverse noise impacts.

    The No Project Alternative would eliminate the potential nonsignificant construction and operations noise impacts. The No Project Alternative is considered to be a relatively environmentally superior alternative with regard to noise issues.

12. Population/Housing: Neither the project nor the No Project Alternative would impact population or housing. Therefore, neither alternative has a potential to adversely affect population or housing, and the two alternatives are neutral regarding this issue.

13. Public Services: The Initial Study found that as there would be no population growth associated with the proposed project, there would be no increase of demand for school or park services. The additional source of water that would be made available to the golf

courses and to other parkland and recreational space through the proposed project is considered a benefit of the project to recreation. The proposed project reclaimed water could also be applied to turf at area schools, which would be a beneficial impact of project implementation on schools as it would be expected to reduce the expense of irrigating turf while improving the reliability of water supply for turf irrigation. The additional source of landscape irrigation water provided by the project would have the potential to reduce demands on the existing water supply and provide and increased margin of security for meeting fire water flow requirements. The additional water supply would therefore be beneficial to fire protection efforts.

The proposed project fulfills the objectives outlined in the IWA Water Master Plan Update and Urban Water Management Plan Addendum by implementing source substitution that diversifies water supply options and reduces reliance on groundwater. Because both Plans rely upon the availability of recycled water from VSD to meet projected water demands, its implementation is deemed essential to a future adequate water supply.

The No Project Alternative would eliminate the potential public service improvements associated with the project because there would be no improved reliability of the water supply to meet fire flow requirements and to irrigate turf and other landscaping. Because the project would not increase demand for water resources but would improve reliability of the water supply, the No Project Alternative is considered to be the environmentally inferior alternative with regard to public service issues.

14. Recreation: As discussed in the Initial Study, because there would be no population growth associated with the proposed project, there would be no increase of demand for recreation or park services. The additional source of landscape irrigation water that would be made available to the golf courses and to other parkland and recreational space through the proposed project is considered a benefit of the project to recreation. One of the sites under consideration for a satellite treatment facility is within Posse Park. Development of a satellite treatment facility on this site would prevent a portion of Posse Park from being developed as parkland or from being used as passive parkland. Given that Posse Park is located on the northern edge of the City and that land north of the site is undeveloped natural lands, the loss of a small area of passive, undeveloped parkland at this location was determined to be a less than significant impact. Mitigation is provided in the Initial Study to ensure that if Posse Park were to be selected as the location for the satellite treatment facility, the conversion of a portion of designated parkland to non-park uses would not result in the ratio of residents to parkland falling below the standard of 3 acres of parkland for every 1,000 City residents.

    The No Project Alternative would eliminate any potential nonsignificant impact that might occur if project facilities were located on undeveloped parkland. The No Project Alternative would not provide for a diversified water supply that would improve the reliability of the landscape irrigation water supplies. Because the project would not increase demand and would improve landscape irrigation water supplies, the No Project Alternative is considered to be the environmentally inferior alternative with regard to recreation issues.

15. Transportation and Circulation: The Initial Study found that the proposed project would result in short-term construction impacts to transportation and circulation that could be fully

mitigated with incorporation of identified measures. No long-term adverse impact to transportation and circulation would occur with project implementation.

The No Project Alternative would eliminate the less than significant (after mitigation) transportation and circulation impacts by eliminating temporary construction impacts. The No Project Alternative is considered to be slightly environmentally superior alternative with regard to transportation and circulation issues.

16. Utilities and Service Systems: The proposed project includes the construction of new and expanded wastewater treatment facilities designed to meet the fundamental objectives of providing recycled water for large-scale irrigation applications within the IWA service area and of providing recycled water for groundwater recharge. Currently, the water supply in the project area relies primarily on groundwater. The tertiary treatment and RO wastewater treatment facilities proposed by the project that are the subject of this EIR have been developed to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area. The proposed project would reduce reliance on nonrenewable groundwater from an aquifer in overdraft. Extensive discussion of the potential water quality impacts of the proposed project is provided in Subchapter 4.5, Hydrology and Water Quality of this DEIR. The technical evaluation conducted for the proposed project found that it would be consistent with both the SWRCB anti-degradation policy and the RWQCB basin plan objectives. The proposed project would have a positive impact on the aquifer both because it would reduce the degree of overdraft that the aquifer would otherwise experience and because the recycled water injected into the aquifer would be of a superior quality to the native groundwater. Further, implementation of the proposed project would not contribute to significant growth, specifically growth beyond that permitted by the general plans of land use jurisdictions in the project area as allocated in regional planning documents, and thus would not create new demands on the existing water and wastewater systems beyond the expansion that is proposed as part of the project.

    The project would generate solid waste over the short-term (construction-related vegetation removal) and long-term (from the RO waste stream required for groundwater recharge) and would make minor alterations to the local drainage pattern. Stormwater management was evaluated and was found not to require mitigation with implementation of the mandatory SWPPP and WQMP BMPs. Based on the analysis in the Initial Study and in Subchapter 4.5, Hydrology and Water Quality of this DEIR, and incorporation of the identified mitigation measures, utilities and service system issues are not forecast to experience significant adverse impacts from project implementation.

    The No Project Alternative would eliminate these potential less than significant impacts on existing utilities, solid waste and stormwater distribution facilities. Given that the impacts to utilities and service systems associated with the project can be mitigated to a nonsignificant level, and that the proposed project would provide improved water reliability and improved water quality of discharged effluent, the No Project Alternative is considered to be the environmentally inferior alternative with respect to utilities and service system issues.

The comparative analysis of the No Project Alternative to the proposed project indicates that the No Project Alternative is environmentally superior with regards to five issues (aesthetics, biological resources, hazards & hazardous materials, noise and transportation & circulation), the

two alternatives are neutral with regards to five issues (cultural resources, geology & soils, land use & planning, mineral resources and population & housing), and the proposed project is environmentally superior with regards to six issues (agricultural resources, air quality, hydrology & water quality, public services, recreation, utilities & service systems). The proposed project is not forecast to be an environmentally superior option for all issues that are considered, in particular the potential biological resource impacts of the proposed project, though mitigable, are greater than those of the No Project Alternative. However, the proposed project is not forecast to cause significant adverse environmental noise impacts after implementation of the identified mitigation measures. Implementing the No Project Alternative would eliminate these forecast less-than-significant effects, but would also not reduce the dependency of the area on groundwater from an aquifer in overdraft or improve the reliability of the area water supply. Because the No Project Alternative would not achieve the project benefits outlined in Chapter 3 of this DEIR, it is not considered a feasible alternative for implementation in place of the proposed project.

5.3 CONCLUSION

The IWA is considering a recycled water project as described in Chapter 3 of this document. Because of the objective to treat wastewater flows from VSD for reuse on large-scale irrigation sites and for recharge of the aquifer in order to use water resources more efficiently and provide greater reliability of water supply, feasible alternatives are very limited. According to the analysis above, the No Project Alternative would obviously eliminate the identified potentially significant impacts, but this alternative does not constitute a reasonable or feasible alternative to the proposed project based on project objectives and benefits.

CHAPTER 6 – TOPICAL ISSUES

Each environmental document contains a certain amount of duplication to ensure that information is conveyed to the decision-makers and interested members of the public in an organized fashion. Chapter 4 contains a detailed discussion of environmental effects that may result from implementing the proposed project. This includes a discussion of project specific and cumulative environmental impacts, as well as discussion of unavoidable adverse impacts for each topic evaluated in the EIR. This section of the EIR combines three "topical issues" that are mandated in the State CEQA Guidelines Section 15126. This section states: "The subjects listed below shall be discussed.....preferably in separate sections or paragraphs of the EIR. These sections are: (c) Significant Irreversible Environmental Changes Which Would be Involved in the Proposed Project Should it be Implemented and (d) Growth-Inducing Impact of the Proposed Project." Section 15130 requires a discussion of Cumulative Impacts. Because of the importance of this topic, a summary of cumulative effects is included in this Chapter. The other major topics required in an EIR (Significant Environmental Effects; Unavoidable Significant Environmental Effects; and Mitigation Measures) are specifically addressed in Chapter 4 of this EIR. Alternatives to the proposed project are evaluated in Chapter 5.

6.1 GROWTH-INDUCING IMPACTS

Traditionally, significant growth is induced in one of three ways. In the first instance, a project is located in an isolated (meaning that it is not currently or routinely served by urban level public service or utility infrastructure) area that when developed brings sufficient urban infrastructure to cause new or additional development pressure on the intervening and surrounding land. This type of induced growth leads to conversion of adjacent acreage to higher intensity uses, either unexpectedly or through accelerated development. This conversion occurs because the adjacent land becomes more suitable for development and, hence, more valuable because of the availability of the new infrastructure. This type of growth inducement is typically termed "leap frog" or "premature" development because it creates an island of higher intensity developed land within a larger area of lower intensity land use.

The second type of growth inducement is caused when development of a large scale project, relative to the surrounding community or area, produces a "multiplier effect" resulting in substantial indirect community growth, although not necessarily adjacent to the development site or of the same type of use as the project itself. This type of stimulus to community growth is typified by the development of major destination facilities, such as Disney World near Orlando, Florida, or around military facilities, such as the Marine Corps Air Ground Combat Center, near Twentynine Palms.

A third, and more subtle, type of growth inducement occurs when land use plans are established that create a potential for growth because the available land and the land uses permitted result in the attraction of new development. This type of growth inducement is also attributed to other plans developed to provide the infrastructure necessary to meet the land use objectives, or community vision, contained in the governing land use agency's general plan. In this type of growth inducement, the ultimate vision of future growth and development within a project area is established in the City General Plan or other comprehensive land use plan. The net effect of a General Plan's land use designations is to establish a set of expectations regarding future land use and growth that may or may not occur in the future, depending upon

the actual carrying capacity for retail space and other circumstances when development is proposed. Thus, a plan may assign an area 100,000 square feet of commercial space, but if actual development does not ultimately generate demand for this much retail square footage, it will never be established.

The growth inducement issue is inherently tied to land ownership because of the manner in which access and development of a project site is envisioned and whether growth on adjacent land can be induced to occur as a result of such extension. For a project to be growth inducing, it must cause certain changes in circumstances affecting development constraints that are required for growth, and the adjacent properties must be available to support such growth.

The proposed project includes the construction of new and expanded wastewater treatment facilities designed to meet the fundamental objectives of providing recycled water for large-scale irrigation applications within and immediately adjacent to the IWA service area and of providing recycled water for groundwater recharge. The purpose of the proposed project is to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area. At present the water supply in the project area relies primarily on groundwater. According to the IWA Water Master Plan Update, the Indio Subbasin within which the project is located has been in overdraft since the 1930's, resulting in groundwater level decline of more than 60 feet in portions of the Lower Valley. Complications of the overdraft condition of the basin include ground subsidence and water quality degradation. The proposed groundwater recharge facilities have been designed to recharge the lower aquifer, which is the aquifer from most of the IWA groundwater wells extract water, and to recharge upgradient of IWA wells such that overdraft conditions in the IWA service area would be ameliorated to some degree.

The Market and Demand Assessment Technical Memorandum prepared by Carollo Engineers dated January 11, 2010 (please refer to Appendix 6) assessed large scale irrigation sites within or adjacent to the City of Indio and estimated the potential market demand for recycled water. The Assessment concluded that the potential customer demand from parks, golf courses, polo clubs, schools and home owner associations would exceed the supply of recycled water even with the projected increased effluent flows expected at build-out of the IWA service area. The Market and Demand Assessment queried potential recycled water users on interest in receiving recycled water and regarding current water sources and consumption. While not all large scale water consumers were reached, and not all that were reached were interested in receiving recycled water, the quantity of potentially available recycled water flows under current conditions (6,722 AF/yr) is much less than the potential demand (15,387 AF/yr) if all large water users were to switch to recycled water if available, as shown in Table 3-1. The proposed IWA Recycled Water Project facilities would be located in such a way as to serve the identified potential customers with recycled water for irrigation, and would not extend recycled water infrastructure to areas that are not already served by existing water service.

Most of the golf courses that the project proposes to serve receive irrigation water from private wells, Colorado River Water via the All American Canal or a mixture of the two sources (Water Master Plan Update 2007). Indio Municipal Golf Course receives irrigation water from IWA as do most of the city parks and local schools. The IWA Water Master Plan Update also indicates that neighboring jurisdictions (CVWD and City of Coachella) propose to treat Canal water for potable use and the IWA 2005 Urban Water Management Addendum dated 2008 indicates that IWA is evaluating both the treatment of Canal water for urban use and the use of Canal water in lieu of groundwater for irrigating some agricultural fields. The tertiary treatment and RO

wastewater treatment facilities proposed by the project would reduce reliance on nonrenewable groundwater from an aquifer in overdraft and would potentially release some Canal water for other uses.

However, the purpose of the project is not to provide an additional source of water for that would facilitate growth beyond that which is planned for in the area general plans. Growth management and the allocation and direction of development are the responsibility of general purpose government (cities and counties). General plans create a set of expectations regarding future land use and growth that may or may not occur depending upon the actual carrying capacity of the various utility and service resources required to meet future growth. The established planning process and the overall growth pressures are the primary causes of future growth, i.e. they induce the actual growth that occurs, and the various utilities, including water service providers, are effectively forced to create urban water management plans that can accommodate such growth, at least within the limits of current or future resources that may be available.

Implementation of the proposed project would not contribute to significant growth, specifically growth beyond that permitted by the general plans of land use jurisdictions in the project area as allocated in regional planning documents. The project would not result in a change in the land use designations in the project area. The proposed project fulfills the objectives outlined in the IWA Water Master Plan Update and Urban Water Management Plan Addendum by implementing source substitution that diversifies water supply options and reduces reliance on groundwater. Because both Plans rely upon the availability of recycled water from VSD to meet projected water demands, its implementation is deemed essential to a future adequate water supply. The needs of existing and projected population as anticipated by the applicable General Plans and General Plan EIRs would be partially met by the IWA Recycled Water Project. Implementation of the proposed IWA Recycled Water Project would result in the provision of recycled water for large-scale irrigation projects and for groundwater recharge both of which contribute to a more reliable water supply for the customers served by the IWA and more efficient use of existing water supplies for existing, approved or planned for development within the project area while reducing the project area's contribution to overdraft of the aquifer.

As it serves existing and planned needs, the proposed project would not induce substantial growth within the City Planning Area, or project area in general, that would exceed official regional or local population projections. As such, this project is considered growth-accommodating, not growth-inducing in that it will help provide adequate water infrastructure to existing, approved and allowed development.

In summary, implementation of the proposed IWA Recycled Water Project would not result in the extension of infrastructure into an undeveloped area, inducing premature development. Neither would it result in development of a new large project that could induce growth beyond that anticipated in the General Plan by a "multiplier effect." Finally, the project would not create or change a land use plan that might cause a potential for growth because the available land and the land uses permitted result in the attraction of new development.

6.2 CUMULATIVE IMPACTS

The intent of a cumulative impact evaluation is to provide the public and decision-makers with an understanding of a given project's contribution to area-wide or community environmental impacts when added to other development occurring in the region. The intent of a cumulative

impact evaluation is to provide the public and decision-makers with an understanding of a given project's contributions to area-wide or community environmental impacts when added to other or all development proposed in an area. Typically, cumulative impacts are discussed in relation to a list of past, present, and reasonably anticipated projects or in relation to broad growth projections contained in general or regional plans (refer to Section 15130(b) of the State CEQA Guidelines). Cumulative impacts are discussed in each issue subchapter of Chapter 4 in this document. The following is a summary of cumulative impacts that are forecast to occur if the proposed project is implemented as proposed and a restatement of the cumulative impacts from Chapter 4.

Aesthetics: Development of the proposed project would expand the treatment facilities within the VSD compound to include tertiary treatment facilities, but as these impacts would occur within a developed wastewater treatment facility, no adverse impact is forecast. It would also change the location of the satellite treatment facility from an undeveloped site in the vicinity of residential, golf course and parkland to an advanced treatment facility for groundwater recharge. The location of ASR wells and booster stations have not been identified, but the aesthetic impact of these small facilities, just as with the satellite treatment facility, is projected to be minimal with implementation of the mitigation requiring development standards that ensure the facilities will not visually conflict with the character of the adjacent development. RO brine flow irrigation fields and evaporation ponds have not been selected, and the aesthetic impact of these facilities would be evaluated in a subsequent environmental document. The pipeline alignments would be temporarily disturbed during construction, but would revert to the existing surface condition after construction. There would be a small, but incremental, change in views of the project area of increased urban infrastructure. This project's contribution to the urban vision contained in the General Plan is not considered to pose a cumulatively considerable adverse aesthetic or visual resource impact with implementation of the community-wide design requirements and project specific mitigation measures outlined in the Initial Study. Therefore, the proposed project is not forecast to make a cumulatively considerable contribution to adverse visual/aesthetic impacts on the local visual setting/environment.

Agricultural Resources: No active agricultural activities currently occur within the project area of impact. Construction of the IWA Recycled Water Project is not forecast to have any adverse impact on adjacent land uses or land use designations. The proposed project would diversify the water supply and provide for increased reliability of water supply. The more efficient use of local water resources would provide for greater stability in the availability of water that would be expected to be beneficial for agriculture. Reduced dependence of large-scale landscaping irrigation on ground and canal water would allow other users, including agriculture, to have greater security in accessing a portion of ground and canal water supplies. Further, the proposed treatment of RO brine would include irrigation of an agricultural crop destined for animal feed, resulting in a small direct benefit to an agricultural resource. Thus implementation of the proposed project would have a beneficial impact on agriculture and has no potential to cause or contribute to any cumulatively considerable adverse impact to agricultural resources.

Air Quality: Almost all of the air pollution in the SCAQMD is directly caused by human activities. These activities include motor vehicle use, industrial emissions, and fugitive dust from disturbing native soil cover or other soil. The proposed project is located within an air basin with poor air quality, particularly in the summer. A short-term increase in dust and equipment exhaust will occur during construction of future proposed improvements; however, these impacts would be short-term and mitigation incorporated would reduce all air quality impacts below a level of significance. Over the long-term, operation of the IWA Recycled Water Project will increase

electrical demand for treatment processing and for boosting recycled water to end users. However, the project would decrease electrical demand associated with pumping groundwater and importing water. Emissions associated with construction and operation of the proposed facilities would be well below SCAQMD CEQA significance threshold for all criteria pollutants, with or without the use of mitigation. Mitigation is proposed that further reduces potential construction impacts.

Based upon the technical document produced for the project and presented in Subsection 4.2 Air Quality, the overall project is expected to result in a net decrease in Greenhouse Gas (GHG) emissions to meet current water demand for the project service area. The proposed project does not propose any uses, or intensity of uses, that are not already authorized and anticipated under the existing applicable General Plans or local growth management plans. The proposed project is not forecast to contribute significantly on the local or regional level to cumulatively considerable air quality impacts.

Biological Resources: The majority of the facilities required to implement IWA Recycled Water Project, including the tertiary treatment facilities and most of the pipeline alignment, would be located within existing developed or highly disturbed settings where no potential for significant impact to biological resources can occur. The IWA Recycled Water Project has the potential to result in a direct impact on riparian/wetland habitat by reducing the quantity of treated effluent discharged to the Coachella Valley Stormwater Channel. However, contingency measures have been identified to reduce any loss of riparian/wetland habitat associated with the Coachella Valley Stormwater Channel to a less than significant level. The IWA Recycled Water Project would also result in the constructed wetland treatment ponds becoming unnecessary for wastewater treatment. However, measures have been identified to maintain the ponds or create comparable acreage of similar habitat at another location in the vicinity. Cumulative biological resource impacts occur when such resources are not avoided, protected or mitigated as previously outlined. Based on the mitigation requirements outlined in Section 4.3 of this EIR designed to ensure that biological resource impacts are avoided or otherwise protected or mitigated, no cumulative significant adverse biological resource impacts are forecast to occur if the IWA Recycled Water Project is implemented as analyzed in the EIR.

Cultural Resources: The construction to be carried out for the proposed project would disturb surface and subsurface areas within the Cities of Indio and La Quinta and in unincorporated portions of Riverside County. The westernmost portion of the proposed project area of impact lies across one of the densest concentrations of prehistoric archaeological sites to be found in Riverside County. The vast majority of project impacts would occur within highly disturbed land areas where native soils have been covered with pavement and structures. However, the project will involve trenching that may expose soils below the depth of previous development even in developed areas. Several of the proposed satellite treatment facility locations are within the boundaries of known cultural sites and historic resources were found during survey of these sites.

Testing and data recovery programs conducted as part of an archaeological monitoring program during earth-moving at the satellite treatment facility locations is required to lessen the level of impact to a less than significant level. Contingency measures are provided in the event that cultural resources are discovered at developed locations that do not require construction monitoring. Procedures have been established to require avoidance or recordation of cultural and paleontological resources and retain the knowledge that discovery and recordation of these resources will provide. Based on these measures, the proposed project is not forecast to cause

or contribute to cumulatively considerable impacts to cultural and paleontological resources in the project area.

Geology/Soils: Based on the analysis in the Initial Study and in Subsection 4.5 Hydrology and Water Quality of this DEIR, and with incorporation of the recommended mitigation, no significant adverse geology, soil or geophysical impacts would occur from project implementation. Exposure to seismic ground shaking during a major regional seismic event was determined to require mitigation to minimize potential hazards to a less than significant impact level. The new facilities that would be installed would be exposed to geotechnical hazards, particularly regional groundshaking from major seismic events, and would be constructed to meet the most recent seismic building code design requirements. The proposed groundwater recharge would inject water into the lower aquifer and would have a small positive impact on the level of the groundwater in the regional aquifer. Because the regional aquifer is in overdraft, raising the groundwater level is considered positive. The liquefaction hazards that occur in the project area are attributed to a semi-perched aquifer that is hydrologically separated from the regional aquifer. The proposed project would not increase the liquefaction hazard in the project area. With implementation of the mitigation measures outlined in the Initial Study, the proposed project would not contribute to cumulatively significant exposure of humans to adverse geologic and soil impacts, including seismic hazards.

Hazards and Hazardous Materials: Hazards, hazardous materials and human health impacts associated with the proposed IWA Recycled Water Project are not forecast to be significant with implementation of mitigation identified in the Initial Study to address the potential for the spillage of petroleum products during construction and contingency mitigation that addresses the potential for encountering unknown soil contamination during construction. Based on the analysis in the Initial Study, the proposed project will not contribute to any new cumulatively considerable adverse hazard impacts with implementation of the identified mitigation.

Hydrology and Water Quality: Based on the evaluation contained in Subchapter 4.5 of this DEIR, implementation of the proposed project is not forecast to cause any cumulatively considerable adverse environmental impacts with implementation of the required SWPPP and WQMP BMPs, as well as monitoring of water quality and impacts from the recycled water application. The proposed project would meet the design standards for 100-year flows and would minimize and control discharge of pollutants during both construction and operation in accordance with current waste discharge requirements established by the Regional Board for the project area. The proposed project would install superior treatment methods for removing pollutants from effluent than currently are in place.

The proposed project would have a positive impact on the aquifer both because it would reduce the degree of overdraft that the aquifer would otherwise experience and because the recycled water injected into the aquifer would be of a superior quality to the native groundwater. The proposed project would be consistent with both the SWRCB anti-degradation policy and the RWQCB basin plan objectives, and fulfills the objectives outlined in the IWA Water Master Plan Update and Urban Water Management Plan Addendum by implementing source substitution that diversifies water supply options and reduces reliance on groundwater. Because both Plans rely upon the availability of recycled water from VSD to meet projected water demands, its implementation is deemed essential to a future adequate water supply. No significant cumulatively considerable water resource or water quality impacts are forecast to result from implementing the proposed project.

Land Use/Planning: The land use and planning evaluation of the proposed project in the Initial Study concluded that the proposed project would not cause any significant adverse or cumulatively significant land use impacts. The project does not rely on nor would it change the underlying land uses within the area of impact or vicinity, thus it would not have any impact on land use or planning issues of a cumulative character.

Mineral Resources: The mineral resources evaluation of the proposed project in the Initial Study concluded that the proposed project would not cause any significant adverse mineral resources impacts. The proposed project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. The majority of the facilities proposed as part of the project would be located in developed areas or within roadways and limited amounts of undeveloped land. Other portions of the project would be located in close proximity to existing residential development where mining operations, if ever warranted, would conflict with adjacent land uses. Implementation of the proposed project would not result in cumulatively considerable mineral resource impacts or a reduction in access to mineral resources.

Noise: Under normal operating conditions the noise levels generated by the facilities required to support the IWA Recycled Water Project are not expected to increase the ambient noise levels to a level of significance that would impact sensitive receptors. With implementation of the mitigation to reduce construction noise and to minimize operation noise impacts through project design and siting, as well as establishment of a noise complaint/response program, the proposed project would not result in a cumulatively considerable noise impact.

Population and Housing: The implementation of the project would not increase the population or the available housing within the project vicinity. Therefore, the project is not considered to have a cumulatively considerable population or housing impact.

Public Services: The Initial Study found that as there would be no population growth associated with the proposed project, there would be no increase of demand for school or park services. The additional source of water that would be made available to the golf courses and to other parkland and recreational space (including school turf) through the proposed project is considered a benefit of the project to recreation as the recycled water would be expected to reduce the expense of irrigating turf and landscaping while improving the reliability of water supply for such uses. The additional source of landscape irrigation water provided by the project would have the potential to reduce demands on the existing water supply and provide and increased margin of security for meeting fire water flow requirements. The additional water supply would therefore be beneficial to fire protection efforts.

The proposed project fulfills the objectives outlined in the IWA Water Master Plan Update and Urban Water Management Plan Addendum by implementing source substitution that diversifies water supply options and reduces reliance on groundwater. Because both Plans rely upon the availability of recycled water from VSD to meet projected water demands, its implementation is deemed essential to a future adequate water supply. No cumulatively considerable impacts are forecast to occur to public services as a result of implementing the project.

Recreation: As discussed in the Initial Study, because there would be no population growth associated with the proposed project, there would be no increase of demand for recreation or park services. The additional source of landscape irrigation water, that would be made available to the golf courses and to other parkland and recreational space through the proposed

project, is considered a benefit of the project to recreation. One of the sites under consideration for a satellite treatment facility is within Posse Park. Development of a satellite treatment facility on this site would prevent a portion of Posse Park from being developed as parkland or from being used as passive parkland. Given that Posse Park is located on the northern edge of the City and that land north of the site is undeveloped natural lands, the loss of a small area of passive, undeveloped parkland at this location was determined to be a less than significant impact. Mitigation is provided in the Initial Study to ensure that if Posse Park were to be selected as the location for the satellite treatment facility, the conversion of a portion of designated parkland to non-park uses would not result in the ratio of residents to parkland falling below the standard of 3 acres of parkland for every 1,000 City residents. No cumulatively considerable adverse impacts are forecast to occur to recreation as a result of implementing the project.

Transportation/Circulation: The Initial Study found that the proposed project would result in short-term construction impacts to transportation and circulation that could be fully mitigated with incorporation of identified measures. No long-term adverse impact and no cumulatively considerable adverse impacts to transportation and circulation are forecast to occur with project implementation.

Utilities and Service Systems: The proposed project includes the construction of new and expanded wastewater treatment facilities designed to meet the fundamental objectives of providing recycled water for large-scale irrigation applications within the IWA service area and of providing recycled water for groundwater recharge. Currently, the water supply in the project area relies primarily on groundwater. The tertiary treatment and RO wastewater treatment facilities proposed by the project that are the subject of this EIR have been developed to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area. The proposed project would reduce reliance on nonrenewable groundwater from an aquifer in overdraft. Extensive discussion of the potential water quality impacts of the proposed project is provided in Subchapter 4.5, Hydrology and Water Quality of this DEIR. The technical evaluation conducted for the proposed project found that it would be consistent with both the SWRCB anti-degradation policy and the RWQCB basin plan objectives. The proposed project would have a positive impact on the aquifer both because it would reduce the degree of overdraft that the aquifer would otherwise experience and because the recycled water injected into the aquifer would be of a superior quality to the native groundwater. Further, implementation of the proposed project would not contribute to significant growth, specifically growth beyond that permitted by the general plans of land use jurisdictions in the project area as allocated in regional planning documents, and thus would not create new demands on the existing water and wastewater systems beyond the expansion that is proposed as part of the project.

The project would generate solid waste over the short-term (construction-related vegetation removal) and long-term (from the RO waste stream required for groundwater recharge) and would make minor alterations to the local drainage pattern. Stormwater management was evaluated and was found not to require mitigation with implementation of the mandatory SWPPP and WQMP BMPs. Based on the analysis in the Initial Study and in Subchapter 4.5, Hydrology and Water Quality of this DEIR, and incorporation of the identified mitigation measures, no cumulatively considerable impacts to utilities and service systems is forecast as a result of implementing the project.

Conclusion: Based on the detailed cumulative impact analysis provided in Chapter 4 for each issue and as summarized above, no cumulatively considerable environmental impacts are forecast to result from implementing the IWA Recycled Water Project.

6.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL IMPACTS

The CEQA Guidelines §§15126, subd.(c), 15126.2 subd.(c), 15127, require that for certain types or categories of project, an EIR must address significant irreversible environmental changes that would occur should the Project be implemented. As presented at Guidelines § 15127, the topic of Significant Irreversible Environmental Changes need be addressed in EIRs prepared in connection with any of the following activities:

(a) The adoption, amendment, or enactment of a plan, policy, or ordinance or a public agency;

(b) The adoption by a local agency formation commission of a resolution making determinations; or

(c) A project which will be subject to the requirements for preparing of an environmental impact statement pursuant to the requirements of the National Environmental Policy Act of 1969, 42 U.S.C. 4321-4347.

The project does not qualify under any of these criteria. Regardless, the project will cause many changes, none of which are irreversible, but they may be long-term changes. The IWA Recycled Water Project would reclaim wastewater and treat it for landscape irrigation or groundwater recharge purposes into the indefinite future. The project would reduce the quantity of effluent discharged by VSD into the Coachella Valley Stormwater Channel. The quantity of effluent that would continue to be discharged is forecast to be sufficient to sustain the habitat downstream of the VSD discharge point into the Channel. Mitigation monitoring would require that if the reduced flows significantly and adversely impacted the habitat downstream of the discharge point, the quantity of effluent would be increased. If impacts occur, they would not permanently irreversible.

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CHAPTER 7 – PREPARATION RESOURCES

7.1 REPORT PREPARATION

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Thomas Harder & Company, Groundwater Consulting

7.2 BIBLIOGRAPHY

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Tom Dodson & Associates, "Initial Study for Recycled Water Program, Indio Water Authority," July 2010

Tom Dodson & Associates, "Notice of Preparation of an Environmental Impact Report for the Indio Water Authority Recycled Water Project," July 6, 2010

CHAPTER 8 – APPENDICES

8.1 NOTICE OF PREPARATION / NOP MAILING LIST / INITIAL STUDY

8.2 NOP COMMENT LETTERS

APPENDIX 8.1

NOTICE OF PREPARATION / NOP MAILING LIST / INITIAL STUDY

INDIO WATER AUTHORITY

July 6, 2010

FROM: Indio Water Authority

TO: Responsible and Trustee Agencies / Interested Organizations and Individuals

RE: Notice of Preparation of an Environmental Impact Report (EIR) for the Indio Water Authority Recycled Water Project

The Indio Water Authority (IWA) will serve as the Lead Agency under the California Environmental Quality Act (CEQA) and will coordinate the preparation of an Environmental Impact Report (EIR) that will evaluate the potential significant environmental impacts that may result from constructing and operating treatment facilities and associated infrastructure designed to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. Currently, VSD discharges (NPDES permit – CA0104477/Order No R7-2010-0010) approximately 7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel (hereafter, Channel). The Channel has it confluence with the Salton Sea approximately 13 miles downstream of the VSD outlet.

An Initial Study has been prepared for the proposed project which identifies the potentially significant environmental impacts of the project. Those issues with a potential to cause or experience significant impact are as follows: air quality, biological resources, cultural resources, hydrology/water quality, and noise. IWA will serve as the Lead Agency for this document based on its responsibility to review and make a decision regarding the funding required before the Project can be developed.

This transmittal constitutes a Notice of Preparation (NOP) for the proposed project EIR and serves as a request for environmental information that you or your organization believe should be included or addressed in the proposed environmental document. A detailed Initial Study with substantiation is attached for review to assist you in providing comments on the scope of the EIR. In addition to any general comments, please be sure to address the scope and content of environmental information or issues that relate to your agency's statutory responsibilities in connection with the proposed project. A scoping meeting will be held on August 3, 2010 at 4 PM in the City of Indio Council Chambers located at 100 Civic Center Mall, Indio, CA 92201.

Comment Period: Based on the time limits defined by CEQA, your response should be sent at the earliest possible during the 30-day review period which will extend from July 6 through August 5, 2010. All comments must be transmitted no later than 30 days from publication of this notice, which is August 5, 2010. All comments and any questions should be directed to:

Mr. Anders Wistrom, Ph.D., P.E.
Principal Water Engineer
INDIO WATER AUTHORITY
83-101 Avenue 45
Indio, CA 92201
Tel: (760) 625-1808
Fax: (760) 391-6433

Project Location(s): The proposed project components are generally located within the City of Indio or the VSD Service Area, with the exception of a pipeline and possible recharge area located east of these boundaries in the County of Riverside. Figures in the attached Initial Study show the regional location and the site-specific locations of proposed facilities, where available. Figure 2 shows the proposed pipeline alignment, potential recycled water customer's irrigation areas, VSD WWTP and the alternative sites under consideration for satellite treatment facilities. Figures 3 through 5 show facilities associated with the treatment alternatives under consideration that would be located within the VSD WWTP. Proposed project facilities occur within R7E and R8E, T4S, T5S and T6S, San Bernardino Base Meridian on the USGS ▪ La Quinta, Indio, Myoma and West Berdoo Canyon Quadrangles, 7.5 Minute Series topographic maps.

Purpose of the Notice of Preparation: The purpose of this Notice of Preparation and attached project description and Initial Study, which contains a discussion of probable environmental effects, is for use in focusing your or your agencies comments for consideration in the EIR. This NOP fulfills legal notification requirements and informs the public and CEQA Responsible and Trustee Agencies that an EIR will be prepared, in this case a project specific EIR. This NOP solicits agency and interested party concerns regarding the potential environmental effects of implementing the proposed infrastructure improvement project at the project location. CEQA encourages early consultation with private persons and organizations that may have information or may be concerned with any potential adverse environmental effects related to physical changes in the environment that may be caused by implementing the project. Responses to the NOP that specifically focus on potentially significant environmental issues are of particular interest to IWA.

All written responses to this NOP will be included in the appendices to the EIR. The content of the responses will help guide the focus and scope of the EIR in accordance with State CEQA Guidelines.

Please refer to the detailed project description included as part of the Initial Study for this proposed project. Each element of this project is outlined in detail and graphics are attached to the Initial Study to assist the reviewer in understanding the potential project and related impacts addressed in the Environmental Checklist Form.

Thank you in advance for any comments you may submit in response to this NOP. For agencies, please include the name of a contact person in your agency if you submit comments. If you have any questions, please contact Mr. Anders Wistrom at (760) 625-1808.

Anders Wistrom, Ph.D., P.E.
Principal Water Engineer

Attachment

OFFICE OF PLANING AND RESEARCH
STATE CLEARINGHOUSE
1400 TENTH STREET
SACRAMENTO CA 95814
(15 copies - CD sent FedEx)

CALIFORNIA DEPT OF PUBLIC HEALTH
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464 WEST 4TH STREET ROOM 437
SAN BERNARDINO CA 92401

CITY OF COACHELLA
CITY MANAGER
1515 SIXTH STREET
COACHELLA CA 92236

CITY OF LA QUINTA
CITY MANAGER
PO BOX 1504
LA QUINTA CA 92247

CITY OF INDIAN WELLS
CITY MANAGER
44-950 ELDORADO DRIVE
INDIAN WELLS CA 92210-7497

COACHELLA VALLEY WILD BIRD CENTER
ENVIRONMENTAL REVIEW
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INDIO CA 92202

COACHELLA VALLEY ASSOCIATION OF GOVERNMENTS
ENVIRONMENTAL REVIEW
73-710 FRED WARING DRIVE STE 200
PALM DESERT CA 92260

COLORADO RIVER BASIN RWQCB (REGION 7)
GENERAL MANAGER
73-720 FRED WARING DRIVE STE 100
PALM DESERT CA 92260

COUNTY OF RIVERSIDE
FLOOD CONTROL AND WATER CONSERVATION DISTRICT
ENVIRONMENTAL REVIEW
1995 MARKET STREET
RIVERSIDE CA 92501

CALIFORNIA DEPT OF FISH & GAME
INLAND DESERT REGION
ENVIRONMENTAL REVIEW
3602 INLAND EMPIRE BLVD SUITE C-220
ONTARIO CA 91764

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ENVIRONMENTAL REVIEW
44-199 MONROE SUITE C
INDIO CA 92201

STATE WATER RESOURCES CONTROL BOARD DIVISION OF CLEAN WATER
ROBERT PONTURERI
PO BOX 100
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US FISH AND WILDLIFE SERVICE
ENVIRONMENTAL REVIEW
6010 HIDDEN VALLEY ROAD
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US BUREAU OF RECLAMATION
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TEMECULA CA 92590

US BUREAU OF LAND MANAGEMENT
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THOMAS HARDER & CO
THOMAS HARDER
601 E YORBA LINDA BLVD SUITE 3A
PLACENTIA CA 92870

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814 — 916/445-0613

SCH #_____

Project Title: Indio Water Authority Recycled Water Program
Lead Agency Indio Water Authority — Contact Person Anders Wistrom
Mailing Address 83-101 Avenue 45 — Phone (760) 625-1808
City Indio — Zip 92201 — County Riverside County

Project Location: County Riverside County — City/Nearest Community City of Indio
Cross Streets roughly bounded by Dillon Road on the east, Jefferson Street on the west, 52nd Avenue on the south, and 37th Avenue on the north — Zip Code 92201
Lat. / Long. 33° 42.861 N / 116° 11.179 W — Total Acres approx. 20 acres
Assessor's Parcel No N/A — Section many — Twp 5, 6 S — Range 6, 7, 8 E — Base SBM
Within 2 miles: State Hwy # I-10 — Waterways Day Creek
Airports Bermuda Dunes Airport — Railways UPRR — Schools several

Document Type:

CEQA: ■ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec
☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) _____ ☐ Other _____
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other _____

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ■ Other Recycled Water Program

Development Type:

☐ Residential: Units _____ Acres _____
☐ Office: *Sq.ft.* _____ *Acres* _____ *Employees* _____
☐ Commercial: *Sq.ft.* _____ *Acres* _____ *Employees* _____
☐ Industrial: *Sq.ft.* _____ *Acres* _____ *Employees* _____
☐ Education _____
☐ Recreational _____
☐ Water Facilities: *Type* _____ *MGD* _____
☐ Transportation: *Type* _____
☐ Mining: *Mineral* _____
☐ Power: *Type* _____ *Watts* _____
■ Waste Treatment: *Type* recycled *MGD* 5-7
☐ Hazardous Waste: *Type* _____
☐ Other: _____

Project Issues Discussed in Document:

■ Aesthetics / Visual
■ Agricultural Land
■ Air Quality
■ Archaeological / Historical
■ Biological Resources
☐ Coastal Zone
■ Drainage / Absorption
☐ Economic / Jobs
☐ Other _____
☐ Fiscal
■ Floodplain / Flooding
■ Forest Land / Fire Hazard
■ Geologic / Seismic
■ Minerals
■ Noise
■ Population / Housing Balance
■ Public Services / Facilities
■ Recreation / Parks
☐ Schools / Universities
☐ Septic Systems
☐ Sewer Capacity
■ Soil Erosion / Compaction / Grading
☐ Solid Waste
■ Toxic / Hazards
■ Traffic / Circulation
■ Vegetation
■ Water Quality
■ Water Supply / Groundwater
■ Wetland/Riparian
■ Wildlife
■ Growth Inducing
☐ Land Use
☐ Cumulative Effects

Present Land Use / Zoning / General Plan Designation: N/A

Project Description: The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. Currently, VSD discharges approximately 7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel (hereafter, Channel), which discharges into the Salton Sea approximately 13 miles downstream of the VSD outlet. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with an **"X"**.
If you have already sent your document to the agency please denote that with an **"S"**.

____	Air Resources Board	____	Office of Historic Preservation
____	Boating / Waterways, Department of	____	Office of Public School Construction
____	California Highway Patrol	____	Parks & Recreation
X	Caltrans District # 8	____	Pesticide Regulation, Department of
____	Caltrans Division of Aeronautics	____	Public Utilities Commission
____	Caltrans Planning (Headquarters)	____	Reclamation Board
____	Coachella Valley Mountain Conservancy	X	Regional WQCB, # 7
X	Coastal Commission	____	Resources Agency
____	Colorado River Board	____	S.F. Bay Conservation & Development Commission
____	Conservation, Department of	____	San Gabriel & Lower L.A. Rivers & Mtns Conservancy
____	Corrections, Department of	____	San Joaquin River Conservancy
____	Delta Protection Commission	____	Santa Monica Mountains Conservancy
____	Education, Department of	____	State Lands Commission
____	Energy Commission	X	SWRCB: Clean Water Grants
X	Fish & Game, Region # 6	X	SWRCB: Water Quality
____	Food & Agriculture, Department of	____	SWRCB: Water Rights
____	Forestry & Fire Protection	____	Tahoe Regional Planning Agency
____	General Services, Department of	X	Toxic Substances Control, Department of
X	Health Services, Department of	X	Water Resources, Department of
____	Housing & Community Development		
____	Integrated Waste Management Board	X	Other Dept. Of Public Health
____	Native American Heritage Commission	____	Other ____
____	Office of Emergency Services		

Local Public Review Period (to be filled in by lead agency)

Starting Date July 6, 2010 Ending Date August 5, 2010

Lead Agency (complete if applicable)

Consulting Firm: Tom Dodson & Associates
Address: 2150 N. Arrowhead Avenue
City/State/Zip: San Bernardino, CA 92405
Contact: Tom Dodson
Phone: (909) 882-3612

Applicant: Indio Water Authority
Address: 83-101 Avenue 45
City/State/Zip: Indio, CA 92201
Contact: Anders Wistrom, Ph.D., P.E.
Phone: (760) 391-1808

Signature of Lead Agency Representative:

Date: 28 JUNE 2010

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

INITIAL STUDY
FOR
RECYCLED WATER PROGRAM

Project Proponent and CEQA Lead Agency:

Indio Water Authority
83-101 Avenue 43
Indio, California 92201

Preparer:

Tom Dodson & Associates
2150 North Arrowhead Avenue
San Bernardino, California 92405
(909) 882-3612

July 2010

REVIEW PERIOD: 7/6/10 – 8/5/10

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APPENDICES

Appendix 1 – Water Balance Study
Appendix 2 – Market Demand and Assessment Technical Memorandum

LIST OF ABBREVIATIONS AND ACRONYMS

AF/yr	acre-feet per year
AOP	advanced oxidation process
ASR	aquifer storage recovery
BMP	Best Management Practices
CEQA	California Environmental Quality Act
CVWD	Coachella Valley Water District
EIR	environmental impact report
HOAs	Homeowner Associations
IWA	Indio Water Authority
LUFT	Leading Underground Fuel Tank
MBR	membrane bioreactor
MF	microfiltration
MGD	million gallons per day
MRZ-1	Mineral Resource Zone 1
NM	nanometer
NPDES	National Pollution Discharge Elimination System
RO	reverse osmosis
RWQCB	Regional Water Quality Control Board
SLIC	Spill, Leaks, Investigations, and Cleanup
SMARA	Surface Mining and Reclamation Act
SPCC	Spill Prevention Control Countermeasure
TDS	total dissolved solids
TSS	total suspended solids
UF	ultrafiltration
UV	ultraviolet
VCP	vitrified clay pipe
VSD	Valley Sanitary District
WWTP	Wastewater Treatment Plant

PROJECT DESCRIPTION

The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. Currently, VSD discharges (NPDES permit – CA0104477/Order No R7-2010-0019) approximately 7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel (hereafter, Channel), which discharges into the Salton Sea approximately 13 miles downstream of the VSD outlet. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand. Please refer to Figure 1 for a regional location map and Figure 2 for a map depicting the City boundaries and VSD facility locations.

The Channel northwest of the VSD WWTP discharge is dry except during periods of intense rainfall, which are rare given that the area averages only 3 inches of rain per year. The Channel southeast of the VSD outlet supports riparian vegetation by the combined flows from storm water runoff, VSD WWTP, Coachella Valley Water District (CVWD) WWTP, the City of Coachella Sanitary District and irrigation flow returns from agricultural fields. The Water Balance Study prepared by Tom Harder & Company for the proposed project details the flows into the Channel (please refer to Appendix 1) which are summarized as follows. USGS gauges provide historical data as to the flows upstream of VSD (2,700 AF/yr) and near the Salton Sea (79,000 AF/yr). As mentioned previously, VSD WWTP discharges approximately 7,000 AF/yr of treated effluent, and CVWD WWTP treats over 5,000 AF/yr of effluent but discharges an undefined quantity into the Channel because much is diverted to other uses. At most, approximately 15,000 AF/yr of Channel flows are attributable to the combined flows from VSD and CVWD WWTP's and storm water with the remaining 64,000 AF/yr of Channel flows passing the gauge near the Salton Sea attributable to the City of Coachella Sanitary District and unmetered irrigation returns.

The Water Balance Study estimated that approximately 3 percent (2,200 AF/yr) of total flows surface water flows are lost due to evapotranspiration between the VSD outlet and the Salton Sea and that only 16 AF/yr of VSD flows percolate into the groundwater aquifer.

As proposed a large portion of the tertiary treated effluent from the VSD WWTP would ultimately be diverted for recycled water projects leaving 0.5 million gallons per day (MGD) to maintain riparian vegetation supported by the VSD WWTP discharge flows in the Channel. Under existing conditions the constructed wetlands treatment system located at the WWTP site currently processes approximately 1 MGD of treated effluent which is mixed with effluent from the pond system and discharged to the Channel. With implementation of the proposed tertiary treatment facilities to the VSD WWTP, the existing wetlands treatment facility could be eliminated.

The closest downstream agricultural irrigation return flow into the Channel occurs approximately 1.5 miles from VSD based upon a review of aerial photos. VSD treated effluent comprise the primary flows supporting riparian vegetation in the first 1.5 miles downstream from the outlet, but these flows contribute a progressively smaller portion of Channel flows with increasing distance as the majority of downstream Channel flows are attributed to irrigation return flow or City of Coachella

Sanitary District flows. The minimum quantity of VSD flows that will be required to maintain riparian vegetation in the Channel has not been established but has been estimated at about 0.5 MGD. It is therefore estimated that the current average flow rate of treated effluent available for recycled water use is 3.3 MGD with peak flow rates estimated to be as high as 4 MGD.

The Market and Demand Assessment Technical Memorandum prepared by Carollo Engineers dated January 11, 2010 (please refer to Appendix 2) assessed large scale irrigation sites within or adjacent to the City of Indio and estimated the potential market demand for recycled water. The Assessment concluded that the potential customer demand from parks, golf courses, polo clubs, schools and home owner associations would exceed the supply of recycled water even with the projected increased effluent flows expected at build-out. Table 1 shows estimates of potential recycled water flows based upon current as well as build-out conditions. The Market and Demand Assessment queried potential recycled water users on interest in receiving recycled water and regarding current water sources and consumption. While not all large scale water consumers were reached, and not all that were reached were interested in receiving recycled water, the quantity of potentially available recycled water flows under current conditions (6,722 AF/yr) is much less than the potential demand (15,387 AF/yr) if all large water users were to switch to recycled water if available, as shown in Table 1.

Table 1
RECYCLED WATER SUPPLY COMPARED WITH POTENTIAL IRRIGATION DEMAND

Flow Condition	Current MGD	Current AF/yr	Ultimate MGD	Ultimate AF/yr
Average Annual Flow Rate from VSD WWTP	6.5	7,282	16	17,925
Wetlands Treatment(1)	1	- - -	0	- - -
Assumed Minimum VSD WWTP Discharge to the Channel	0.5	- - -	0.5	- - -
Available Average Recycled Water Irrigation Flow Rate	6.0	6,722	15.5	17,365
Estimated Peak Daily Recycled Water Irrigation Flow Rate (Average * 1.2)(2)	7.2	- - -	15.6	- - -
Potential Average Annual Irrigation Water Demand	- - -	15,387	- - -	15,387

Notes:

1. The existing wetlands treatment facility could be eliminated after adding tertiary treatment facilities to the VSD WWTP.

2. Peak irrigation flow rates are a function of the specific customers that are scheduled to use water at any given time, and would need to be managed within the limits of both water supply and water delivery infrastructure.

Source: Technical Memorandum No. 1 – Market and Demand Assessment, January 2010

The Recycled Water Treatment Alternatives and Delivery Corridor Options Technical Memorandum No. 4 dated January 2010 by Carollo Engineers develops preliminary recommendations regarding effluent treatment alternatives and potential pipeline routes based upon potential customers. Treatment requirements for groundwater recharge are more stringent than those required for irrigation, and the alternatives propose tertiary treatment that complies with Title 22 Standards for recycled irrigation water to be installed at VSD WWTP whereas groundwater recharge treatment

would be located near the potential ASR injection wells, currently proposed for Posse Park, the Indio Golf Course or one of several other potential sites within the City. Through this design only the effluent destined for groundwater recharge would be treated through the costlier groundwater recharge treatment system.

Spreading basins for recharging Coachella Canal water in Berdoo Canyon near the Citrus Ranch area adjacent to Dillon Road are under consideration as part of a separate project, which if implemented, could provide an alternative for groundwater recharge of recycled water.

RECYCLED WATER TREATMENT ALTERNATIVES

There are several treatment options that would comply with Title 22 Standards for irrigation water: tertiary filtration, tertiary microfiltration and membrane bioreactors. Title 22 effluent requirements for each treatment option are tailored to ensure the reliability of the specific treatment option. All alternatives will require disinfection as the final treatment step.

Tertiary filters

Tertiary filters are designed to remove total suspended solids (TSS) from secondary effluent by passing it through a filter media, which may consist of fine sand, anthracite and sand, or cloth. The filter options evaluated for this project were continuous backwash, upflow, sand filters (DynaSand®) and cloth disk filters. Tertiary filtration is a lower cost option for the production of Title 22 irrigation water and is approved in many current installations, but because tertiary filters only remove TSS, any requirement for nutrient removal would need to be accomplished in the secondary treatment process.

Both the DynaSand® and cloth media filters are available either as stand-alone package units or in a modular concrete design. The continuous backwash DynaSand® filter operates with an upflow, counter-current flow pattern and provides initial contact of unfiltered water with the dirtiest sand in the filter. The dirty sand moves downward away from the water's flow path to the air scour tube. The water's upward flow path passes through progressively cleaner filter media until it exits from the surface of the cleanest media. A typical filter cell includes the components of four filter modules within a reinforced concrete filter chamber. The filter’s deep media bed allows it to handle high levels of suspended solids.

Cloth media filters are low-head systems and are designed to backwash automatically based upon water level pressure differential while maintaining continuous filtration during backwash. The typical backwash volume represents approximately 2 to 3 percent of the feed flow with a recovery time of less than 3 minutes, compared to other typical filters, which can take up to 20 minutes. The disks can be provided in tanks with various numbers of disks depending on the design flow.

If this option is selected, tertiary filters would be installed at the VSD WWTP. The facility would include a secondary effluent pump station, flocculation, tertiary filters, disinfection, recycled water storage, and a recycled water pump station. A conceptual site layout of the tertiary filtration system is presented on Figure 3. The secondary effluent pump station would be constructed near the existing Chlorine Contact Tank No. 3 and would pump secondary effluent to the tertiary filtration system located in the northwest corner of the treatment facility. The tertiary filtration system will be easily accommodated in the northwest corner of the site where it would not interfere with the facility’s master plan expansion of the secondary facilities.

Tertiary Microfiltration
Tertiary Microfiltration (MF) membranes are an efficient technology for particle removal and pathogen control. These technologies yield finished water turbidities consistently below 0.1 NTU, independent of feed water quality. Membrane filtration is a pressure-driven process that provides a near absolute barrier to suspended solids and microorganisms. MF membranes have a pore size ranging from 0.1 to 0.5 microns.

The MF process would provide greater flexibility for future groundwater recharge and would require less of a footprint than the tertiary filtration option. If this option is selected, the existing (abandoned) Chlorine Contact Tank No. 1 structure could be modified to function as a membrane tank. The membrane permeate would be pumped from the membrane tank to the disinfection system and recycled water pump station located on the north side of the facility near the channel and freeway (I-10) crossing. The Title 22 facility would include MF, disinfection, recycled water storage, and a recycled water pump station. A preliminary conceptual site layout of the tertiary MF system is shown on Figure 4.

Membrane Bioreactor
The Membrane Bioreactor (MBR) process is a biological process that uses MF or ultrafiltration (UF) membranes installed in membrane tanks to separate solids and produce a high-quality effluent. The MBR process is capable of achieving the nutrient removal requirements for effluent ammonia and nitrate to be compatible with future treatment requirements for groundwater recharge and proposed turf grass applications. Membranes used in MBR applications are typically polymeric (but may be ceramic) media with pore sizes in the range of 0.04 microns to 0.4 microns. The physical separation barrier provided by the membranes is the most effective and reliable treatment mechanism to meet recycled water requirements, and is less susceptible to process upsets.

The MBR process is a higher cost alternative, but has advantages over tertiary filtration and would require less of a footprint than the tertiary filtration option. The MBR process would provide more flexibility for future groundwater recharge and could cost effectively increase plant capacity. If this option is selected, the existing aeration basin could be converted to an MBR by modifying the existing (abandoned) Chlorine Contact Tank No. 1 structure to function as a membrane tank. The membrane permeate would be pumped from the membrane tank to the disinfection system and recycled water pump station located on the north side of the facility near the channel and freeway (I-10) crossing. The Title 22 facility would include fine screens, MBR, disinfection, recycled water storage, and a recycled water pump station. A conceptual site layout of the MBR system is shown on Figure 5.

ADVANCED TREATMENT FOR GROUNDWATER RECHARGE

Only one treatment option is proposed for the production of recycled water for groundwater recharge. The advanced treatment system would be designed to treat water for groundwater recharge and would not be located at the VSD treatment facility, but could be located near the potential recharge location either at Posse Park or at one of several other potential locations. The system would take water from the Title 22 irrigation water distribution system for further treatment and recharge. This would allow the IWA/VSD to produce two qualities of recycled water: one for general irrigation use, and the second, a much higher water quality, for ground water injection. Such an approach would be less costly than producing only the higher quality recycled water that could be used for either irrigation or injection.

If tertiary filters are selected for treatment of Title 22 irrigation water, the ground water recharge treatment process would include MF or UF because it is required as pretreatment for the proposed

Reverse Osmosis (RO) membrane treatment process. MF or UF design includes backwash flow, so if either were installed at the satellite advanced treatment facility rather than at VSD WWTP, the backwash flow would be discharged to the sewer to flow back to the treatment plant.

The RO membrane treatment process removes dissolved inorganic and organic compounds from the recycled water by forcing water through an ion selective membrane by applying a pressure in excess of the osmotic pressure. RO is considered a "high-pressure" process because it operates from 75 to 1,200 psig, depending upon the total dissolved solids (TDS) concentration of the feed water. The high pressure feeds water through the membranes thereby concentrating the dissolved solids that cannot travel through the membrane. The RO process removes salts, hardness, synthetic organic compounds, disinfection-by-product precursors, etc. However, dissolved gases such as H_2S and CO_2, and some organic pesticides pass through RO membranes.

Typical recoveries for RO plants operating on domestic wastewater are around 85 percent depending on the type and concentrations of sparingly soluble salts (calcium sulfate, calcium carbonate, silica, etc.) in the feed water. The RO process concentrates and separates components of the feed water resulting in concentrated brine that must be discharged. Alternatives for brine management include sending it to a large system of local evaporation ponds, further treatment to increase finished water production and decrease brine volume thereby reducing the size of the evaporation ponds, a regional brine management plan consisting of large evaporation ponds, or, where possible, to ocean disposal.

The groundwater recharge treatment facility would also include an ultraviolet (UV) advanced oxidation process (AOP) using hydrogen peroxide to provide disinfection and oxidation of micro-constituents. UV disinfection is a physical process that uses no toxic chemicals and produces no known toxic residuals or byproducts. The disinfection mechanism of UV light damages or destroys an organism's genetic material by transference of electromagnetic energy [wavelength of 254 nanometers (nm)] from a UV lamp to the genetic material, preventing the organism from replicating. The UV system would be coupled with a small dose of hydrogen peroxide, which would produce hydroxyl radicals which attack and destroy many microconstituents. This process would be followed by a chemical stabilization step to protect the distribution pipeline, finished water storage, and a finished water pump station.

The finished water would be pumped to on-site storage or to recharge wells at Posse Park or at one of several other potential locations. A preliminary conceptual layout of the groundwater recharge treatment facility is shown on Figure 6, which indicates that there is adequate space at this site to accommodate the facility. Figure 6 includes footprint requirements for MF to provide a conservative site layout.

CONCEPTUAL RECYCLED WATER DELIVERY CORRIDOR OPTIONS

The recycled water delivery system is a key component of the overall recycled water program for the IWA. Figure 2 shows a map of the VSD and IWA boundaries, potential large recycled water customer locations, and a conceptual backbone pipeline route. To minimize infrastructure and pumping costs, the IWA may choose to deliver water at a pressure that is sufficient only to supply golf course ponds. The golf courses would then pump from the ponds to pressurize their irrigation systems. Recycled water pipelines would then be sized to deliver up to the maximum daily flow rate and not the peak flow rate from the recycled water pumps. Smaller recycled water users such as HOAs and City parks may need to provide booster pumping facilities to pressurize their irrigation systems in order to use recycled water. A phased program would add these smaller users as the recycled water transmission mains are extended to the larger users.

The first phase of the recycled water delivery system would construct a pipeline from the VSD WWTP north across the Channel and Interstate 10 to Posse Park, or one of several nearby alternate locations, and the Indio Municipal Golf Course. IWA would establish service to City-owned facilities and would develop policies for future connections based upon this experience. If IWA chooses to construct ASR injection wells, then the pipeline infrastructure would be in place for these wells. A 16-inch line would provide up to 4.9 MGD and would be sufficient to supply all of the prospective customers north and east of Interstate 10. It is assumed that well injection would occur during low irrigation demand periods.

There are several alternatives under consideration to cross the Channel and freeway (I-10). The first alternative would utilize an existing 14-inch pipeline (studied by Mainero, Smith and Associates, 2004) within the 54-inch casing that also contains three depressed sewer lines that crosses the Channel and freeway. However, the existing capacity of the three sewers would not be sufficient to convey wastewater flows from areas north of Terra Lago. If VSD provides treatment, under contract to the City, for the Dillon Road Corridor from Avenue 44 to the north, then the existing 14-inch diameter pipeline would be needed for wastewater flows or another depressed sewer line would need to be installed.

A second alternative would install the proposed pipeline by horizontal directional drilling beneath the channel and conventional jack and bore construction under Interstate 10. This option would be more expensive than converting an existing pipeline.

A third alternative that was studied by Dudek and Associates, Inc. in July of 2004 would convert an abandoned 15-inch diameter vitrified clay pipe (VCP) depressed sewer beneath the channel to a pressure pipe utilizing Duraliner™ which would result in an inside diameter of 13.5 inches. From the north side of the channel the recycled water would be transported across Interstate 10 by slip lining the abandoned 18-inch diameter VCP sewer with a 16-inch diameter fusible PVC pipe, which has an inside diameter of 15 inches. These three alternatives will be studied further in the next phase of this project.

From Interstate 10 the 16-inch diameter transmission main would run north in Golf Center Parkway to 42nd Avenue then west to the Indio Municipal Golf Course where the pipeline would reduce to 12 inch diameter and would ultimately continue west on 42nd Avenue to Madison then north to Shadow Hills Golf Course. A stub out would also be provided at 44th Avenue for future extension of a 16-inch transmission main to Dillon Road and then north to the Citrus Ranch area for recharge with Coachella Canal water in spreading basins. Please refer to Figure 2.

The second phase of the water delivery system would install a transmission main south and west of the VSD WWTP to serve the Indian Palms Country Club, Plantation Golf Club, the polo clubs and several of the City's parks. Please refer to Figure 2. The 24-inch diameter transmission main would be constructed in Van Buren Street to the south of VSD WWTP and then across the railroad and Indio Boulevard by jack and bore construction. It would then continue south on Van Buren Street to Dr. Carreon Boulevard, west to Jackson Street, south on Jackson Street to 48th Avenue then west to Monroe Street. The installation would continue south on Monroe Street with a 20-inch diameter pipeline to Indian Palms Country Club, Plantation Golf Club, Empire Polo Club, and El Dorado Polo Club. Laterals could be provided to serve Jackson Park, Riverside County Fairgrounds and Carreon Park.

The third portion of the water delivery system would install a line from the intersection of Monroe Street and 48th Avenue to the Heritage Palms Golf Course and Indian Springs Country Club. Please refer to Figure 2. This line could also serve HOAs and parks in the area. This pipeline

would be 16-inches in diameter. If the Bermuda Dunes Golf Course (located outside the City limits) would be served, then the pipeline would be 20-inches in diameter. The Shadow Hills and Bermuda Dunes Golf Courses would be a lower priority for recycled water service because Shadow Hills Golf Course is already using recycled water, and the Bermuda Dunes Golf Course is outside of the City boundaries. However, if the IWA had sufficient recycled water available that could not be used by other potential customers, then 12-inch pipelines could be constructed to deliver water to these customers.

ASR Wells

The exact location and configuration of the proposed ASR wells would be determined by the specific requirements of the geologic strata. In general, it is expected that any ASR well would inject recharge water into the lower aquifer. Because the existing water quality in the lower aquifer is of high quality, the water quality of recharge water and potential adverse impacts to aquifer water quality will be evaluated. Further, depending upon the quantity and rate of recharge as well as the existing depth to the water table, the potential impacts of water mounding near the injection site will also be evaluated. ASR well location is also regulated by the existence of and distance to production wells to ensure a minimum distance and travel time for recharged water in accordance with regulatory requirements.

Development of up to four new ASR wells, assuming all wells were constructed in a single year, would require the delivery and set up of the drilling rig. It is anticipated these wells would be drilled at the same time and the drilling equipment would be transported to and from each site on one occasion. For the purposes of this evaluation, it is forecast that delivery of the drilling equipment one time over a single year would result in one 50 mile round-trip at an average speed of 30 mph.

The drilling and development of each well to a depth of up to 850 feet would take approximately 45 days, of which 15 to 20 days would include 24-hour drill activity. Delivery of the well casings, pumps, motors, etc. for each well is forecast to result in about 1,000 miles being traveled by trucks averaging about 45 mph. Calculations assume two workers would each commute 40 miles round-trip to the work site. Typically, well drilling requires only minimal earth movement and/or grading. The well casings are expected to be welded and it will be assumed that well development and installation would require two weeks of diesel generator support.

ASR well development has essentially the same construction impacts as production well development. The primary physical difference between ASR and production wells is that different valve options are installed according to the type of well.

CEQA CHECKLIST FORM

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- ■ Aesthetics
- ■ Biological Resources
- ■ Hazards & Hazardous Materials
- ❑ Mineral Resources
- ❑ Public Services
- ■ Utilities / Service Systems
- ❑ Agriculture Resources
- ■ Cultural Resources
- ■ Hydrology / Water Quality
- ■ Noise
- ❑ Recreation
- ❑ Mandatory Findings of Significance
- ■ Air Quality
- ■ Geology / Soils
- ❑ Land Use / Planning
- ❑ Population / Housing
- ■ Transportation / Traffic

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation, the following finding is made:

	The proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
	Although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
	The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
■	The proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	Although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature (prepared by)

Signature

Date

28 JUNE 2010

Date

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
I. AESTHETICS – Would the project:				
a) Have a substantial adverse effect on a scenic vista?			■	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?			■	
c) Substantially degrade the existing visual character or quality of the site and its surroundings?		■		
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		■		

SUBSTANTIATION (check ___ if project is located within the viewshed of any Scenic Route listed in the General Plan):

a. *Less than significant impact* – In the project area there are scenic views to surrounding mountain ranges or ridges in all directions, but the project sites and the alignment have no significant or unique visual resources. Existing development in the valley creates a human-dominated close range visual setting with long distance views of natural landscapes on area mountains.

At the VSD WWTP site, the surrounding land uses are predominantly industrial, with the exception of the Coachella Valley Stormwater Channel. The proposed above ground facilities at VSD WWTP would be located within the existing WWTP compound and would not result in a substantial change to the visual setting of the site. The proposed pipelines will be located within existing roadway alignments or within disturbed areas throughout the City. The recycled water distribution system pipeline installation will not change land uses, or cause any long-term above-ground visual impacts after completion of construction activities.

Four City or IWA-owned sites located along or north of 42nd Avenue are currently under consideration for the proposed satellite treatment facility site. Posse Park is one of the possible sites, with another parcel located immediately north of Posse Park across a canal and the two remaining parcels located on the south and east sides of Indio Municipal Golf Course. Any of the sites would result in the change of use from vacant recreation or open space to above-ground wastewater treatment facilities. All four sites are vacant and located within mixed residential and recreational use lands. Proposed waste water treatment facilities would be visible from adjacent residential and recreational properties. All of the proposed above-ground facilities will be approximately the same height as surrounding structures and facilities, but will exhibit greater mass, particularly at the satellite treatment facility location. The satellite treatment facility would change foreground views, but the new structure would not be tall enough to block background views of area mountains. Mitigation is proposed under item (d) of this section to minimize adverse impacts associated with proposed changes at the selected satellite treatment facility site. The proposed project would not have an adverse effect on the scenic vista.

b. *Less than significant impact* – The proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. No scenic resources, such as historical buildings, trees, or rock outcropping, would be removed, altered, or obstructed as part of the proposed project. See discussion (a) above. No scenic highways would be impacted by the proposed project.

c. *Less than significant impact with mitigation incorporated* – The proposed project would not substantially degrade the existing visual character or quality of a project site and its surroundings. The recycled water pipelines will be placed below ground surface and therefore has no potential to degrade the existing visual character of pipeline alignments. Any pump stations and similar facilities will be housed in structures at locations that will be designed to blend in the adjacent land uses. Facility improvements at VSD WWTP in support of providing recycled water would be located within the existing disturbed WWTP compound. The potential project related installation that would result in the greatest change to the visual setting would be the proposed satellite treatment facility that would be installed for the further treatment of recycled water for ground water recharge. All four sites currently under consideration are vacant properties located in a residential area. All of the proposed above-ground facilities will be approximately the same height as surrounding structures and facilities, but will exhibit greater mass, particularly at the satellite treatment facility location.

I-1 ***Any satellite treatment facility infrastructure shall be designed to blend with the character of the surrounding development. Improvements shall include fencing and exterior landscaping consistent with the character of the adjacent development. And components of the facility infrastructure that may be visible from adjacent properties shall be painted in non-reflective tones that blend with the surroundings.***

With implementation of the above mitigation measure, changes in the visual setting resulting from development of the proposed project will be adverse, but the degree of change at is not considered to substantially adverse. No substantial degradation of existing visual character or quality of these alignments is forecast to result from implementing the proposed project.

d. *Less than significant impact with mitigation incorporation* – Exterior night lighting occurs throughout the project area at residences, commercial and industrial establishments and as street lights.

Project construction, particularly ASR well drilling, may require temporary night lighting during nighttime construction. There may be some new permanent lighting in the wastewater treatment plant area and at the satellite treatment facility site to support operations and safety at the proposed facility sites. However, the surrounding areas have residential, commercial and industrial development with exterior night lights, such that the new lighting at the sites would not be considered to result in a substantial change to the project area. The project area is within the area that influences astronomical viewing for the Mount Palomar Observatory in San Diego County and as such, and to protect, nearby residences or facilities from direct light and glare from new lighting, the following mitigation measure will be implemented.

I-2 ***A facilities lighting plan shall be prepared and shall demonstrate that glare from operating and safety night lights that may create light and glare affecting adjacent properties are sufficiently shielded to prevent light and glare from spilling off of project facilities. Lighting shall be directed towards the ground with shielding designed to prevent light from spilling skyward. The facilities lighting plan shall be implemented in conformance with the City of Indio guidelines, and it shall be reviewed and approved by the Authority staff prior to installation of night lighting.***

With implementation of the above measure potential light and glare can be controlled to a less than significant impact level.

Conclusion

Based on the analysis and findings presented above, the aesthetic issue does not pose any significant adverse impacts to the environment at any of the facility locations. Therefore, the aesthetics issue will not be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
II. AGRICULTURE RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert viable farmland (Prime Farmland, Unique Farmland, or Farmland of Statewide Importance) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				■
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				■
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use?				■

SUBSTANTIATION (check ___ if project is located in the Important Farmlands Overlay):

a. *No impact* – The proposed project would not convert prime farmland, unique farmland, or farmland of statewide importance, as shown on the Central Riverside County Important Farmland 2008 map prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use. Of the sites under consideration for the satellite treatment facility, the map shows the sites adjacent to Indio Municipal Golf Course as "urban and built-up land" and Posse Park and the site immediately north of it as "other land." The legend describes both of these land classifications as land not suitable for agriculture.

   The project sites located within the City of Indio are in developed areas unsuitable for general agricultural operations and are zoned for residential, commercial, industrial or other similar urban/suburban uses or open space. The single family residential zone includes large lot residential properties that may include some agricultural uses such as equestrian use. However, the areas impacted by the proposed project within Indio would not include prime farmland, unique farmland, or farmland of statewide importance.

b. *No impact* – The proposed project would not conflict with existing zoning for agricultural use, or land under Williamson Act contract. See issue (a) above.

c. *No impact* – The proposed project would not involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland, to non-agricultural use. The reclaimed water, while currently envisioned for irrigation of landscaping areas and for groundwater recharge, could potentially provide a source of supplemental water for agricultural uses, which would be a benefit to agricultural operations if it occurred. See issue (a) above.

Conclusion

Based on the analysis and findings presented above, no direct or indirect adverse agricultural resources impacts can occur from implementing the proposed project. Therefore, this issue will not be carried forward into the EIR for evaluation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	■			
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	■			
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	■			
d) Expose sensitive receptors to substantial pollutant concentrations?	■			
e) Create objectionable odors affecting a substantial number of people?	■			
f) Result in greenhouse gas emissions that would hinder or delay the State's ability to meet the reduction targets contained in AB 32?	■			

SUBSTANTIATION (discuss conformity with the South Coast Air Quality Management Plan, if applicable):

a-f. *Potentially significant impact* – The proposed project has the potential to generate substantial air pollution emissions. Significant adverse impacts to air quality may result from implementing this proposed project. All air quality issues, greenhouse gas emissions and climate change impacts, will be addressed in the EIR.

Conclusion

Due to the potential for significant air pollution emissions, a detailed technical study of these emissions will be prepared and this issue will be included in the EIR for evaluation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
IV. BIOLOGICAL RESOURCES – Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	■			
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	■			
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	■			
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	■			
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	■			
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	■			

SUBSTANTIATION (check if project is located in the Biological Resources Overlay ___ or contains habitat for any species listed in the California Natural Diversity Database ___):

a-f. *Potentially significant impact* – These issue areas will be further analyzed in an EIR.

Conclusion

Due to the potential for significant biological resource impacts, a detailed evaluation will be prepared and this issue will be included in the EIR for evaluation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
V. CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?	■			
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	■			
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	■			
d) Disturb any human remains, including those interred outside of formal cemeteries?	■			

SUBSTANTIATION (check if the project is located in the Cultural ___ or Paleontologic ___ Resources overlays or cite results of cultural resource review):

a-d. *Potentially significant impact* – These issue areas will be further analyzed in an EIR.

Conclusion

Due to the potential for significant cultural resource impacts, a detailed evaluation will be prepared and this issue will be included in the EIR for evaluation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
VI. GEOLOGY AND SOILS – Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
• Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.		■		
• Strong seismic ground shaking?		■		
• Seismic-related ground failure, including liquefaction?	■			
• Landslides?				■
b) Result in substantial soil erosion or the loss of topsoil?			■	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	■			
d) Be located on expansive soil, as defined in Table 18 1-B of the Uniform Building Code				■
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				■

SUBSTANTIATION (check ✔ if project is located in the Geologic Hazards Overlay District):

a. *Potentially significant impact* – The proposed project sites, as with most of southern California, is in a seismically active area and will most likely be subject to substantial groundshaking during the life of the project. An Alquist-Priolo Zone runs along the channel north of Posse Park, but it does not include Posse Park or the two sites adjacent to Indio Municipal Golf Course. However, it does appear to cross through the potential satellite treatment facility site located north of Posse Park. The pipeline proposed along 44th Avenue to Dillon Road would cross the Alquist-Priolo Zone and associated fault. As an essential public facility (Risk Class I or II), all project related facilities must be designed to withstand the groundshaking from a predictable major seismic event on the major faults in the region (San Andreas Fault). Mitigation is identified below to address this issue.

VI-1 Comprehensive geotechnical investigations shall be required prior to engineering and design development or structural and/or substantial rehabilitation of structures identified under Risk Class I & II, e.g., public facilities, as identified below:

- ***Risk Class I & II, Structures Critically Needed after Disaster: Structures that are critically needed after a disaster include important utility centers, fire stations, police stations, emergency communication facilities, hospitals, and critical transportation elements such as bridges and overpasses and smaller dams.***
  <u>Acceptable Damage</u>: Minor non-structural; facility should remain operational and safe, or be suitable for quick restoration of service.
- ***Risk Class III: High occupancy structures; uses are required after disasters (i.e., places of assembly such as schools and churches).***
  <u>Acceptable Damage</u>: Some impairment of function acceptable; structure needs to remain operational.
- ***Risk Class IV, Ordinary Risk Tolerance: The vast majority of structures in urban areas; most commercial and industrial buildings, small hotels and apartment buildings, and single family residences.***

With implementation of the above measure, the proposed project will not subject humans to potential substantial adverse geologic constraints/effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault or strong seismic ground shaking. Measures to meet this seismic mitigation measure include enhanced foundation support; use of higher quality materials and more steel in the structures; and other similar measures that ensure the proposed facilities can function after a major seismic event.

The proposed project components are not located on steep slopes and are also not subject to landslides. Slopes in the project area are less than 15% as shown on Figure 15 of the Western Coachella Valley Area Plan of the Riverside County General Plan with the exception of the potential satellite treatment facility located north of Posse Park, which is mapped as having slopes of between 15 and 25%. No impact associated with landslides is anticipated and this issue requires no further consideration.

Figure 5.6-2 Geological Hazard Map of the General Plan shows that the eastern portion of the City of Indio is susceptible to liquefaction due to groundwater levels that are typically within 30 feet of the ground surface. Because any groundwater recharge could exacerbate liquefaction conditions, or create them due to water mounding near injection wells, the potential for liquefaction-related hazards will be evaluated in conjunction with hydrology and water quality impacts in the EIR.

b. *Less than significant impact* – During construction, the construction/installation of the proposed facilities has a potential to cause soil erosion. Any erosion and sedimentation that may occur due to construction activities will be controlled through the appropriate use of best management practices (BMPs) for wind and water erosion. Because the combined area of impact of all of the project components is larger than one acre, a NPDES general construction permit will have to be filed and a SWPPP and WQMP compiled and implemented with best management practices for short-term and long-term erosion control. Therefore, based on the mandatory implementation of SWPPP and WQMP components, potential erosion impacts related to installing the proposed facilities will not cause any significant adverse erosion or sedimentation impacts within the project APE. Specific BMP's should be selected prior to construction, but can include use of sandbags, straw bales, sediment traps, sediment basins, limiting the run of slopes, cover mats and/or revegetation of disturbed areas at the earliest possible time after disturbance.

c. *Potentially significant impact* – The project sites and alignment are generally level and harbor no potential for rockfalls or landslides, as discussed under item (a). However, the project is located in an area of sandy soils, which are generally unstable, i.e., non-cohesive. Construction will occur in localized and contained areas such that adjacent areas should not be affected. With implementation of the

following mitigation measures, construction practices can minimize impacts to a less than significant level.

VI-2 Construction specifications will include appropriate measures for stabilizing excavations (such as covering soil piles with plastic or using spray on soil stabilizers to control fugitive dust) based on recommendation of project geotechnical studies.

VI-3 Trenches will remain open for as short a time as possible.

VI-4 Soils, where exposed, will be stabilized with hay bales or aggregate cover.

VI-5 Construction specifications will identify proper compaction for backfilled soils.

Implementation of these measures would ensure stability of the underlying soils during and after construction and requires no further consideration.

Regarding liquefaction, refer to the response to (a) above, which explains that this issue will be evaluated in the EIR for the project as part of the Hydrology and Water Quality analysis.

d. *No impact* – The proposed project would not be located on expansive soil, creating substantial risks to life or property. The project impact area, including pipeline alignments, are generally located on sandy soils that are not expansive, so no adverse impacts from this type of hazard will affect construction or operations. No mitigation is proposed.

e. *No impact* – The proposed project is the construction and installation of wastewater treatment and water recycling facilities. The project does not include installation or operation of any proposed septic tanks, so there can be no adverse impacts regarding this issue. No mitigation is proposed.

Conclusion

The potential for liquefaction-related hazards will be evaluated in conjunction with hydrology and water quality impacts in the EIR. Based on the analysis and findings presented above, all other geology and soil issues can be mitigated to below a level of significance with implementation of the incorporated mitigation measures and therefore, will not be carried forward into the EIR for evaluation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
VII. HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			■	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		■		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			■	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?		■		
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			■	
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?			■	
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			■	
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				■

SUBSTANTIATION:

a. *Less than significant impact* – The proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. During construction there is a potential for accidental release of petroleum products in sufficient quantity to pose a substantial hazard to people and the environment. An accidental spill of diesel fuel or of other petroleum products, such as oil, radiator fluid or transmission fluid from a piece of construction equipment, poses a hazard to both employees and the environment where it occurs. Best Management Practices will be implemented and these measures would reduce such potential hazards to a less than significant impact level by ensuring that any spills are immediately remediated during construction and returned to an uncontaminated condition.

   Once construction is completed, there will be routine transport or use of hazardous materials at the project sites, for maintenance of equipment and wastewater treatment processes. The Authority and VSD already have their own operational procedures that address potential impacts from routine transport and use of hazardous materials in conjunction with the water supply system. Long-term BMPs and a Spill Prevention Control Countermeasures (SPCC) Plan will control the accidental releases of petroleum products and other wastes associated with a wastewater treatment operations. No additional mitigation to control accidental releases during operations is needed.

b. *Less than significant impact with mitigation incorporation* – During construction there is a potential for accidental release of petroleum products in sufficient quantity (several hundred gallons of fuel) to pose a significant hazard to people and the environment. Because the construction equipment can contain enough petroleum products to damage the environment or expose people to hazardous emissions, the City requires compliance with Best Management Practices to manage clean-up of potential spills of hazardous materials during construction. However, to ensure that the SWPPP contains sufficient measures to address accidental spills, the following mitigation measure will be implemented.

   VII-1 All spills or leakage of petroleum products during construction activities will be remediated in compliance with applicable state and local regulations regarding cleanup and disposal of the contaminant released. The contaminated waste will be collected and disposed of at an appropriately licensed disposal or treatment facility.

   Though the risk of accidents would not be eliminated, the effects of such an accidental release of hazardous material would be controlled to a less than significant level by implementing this measure in conjunction with standard City policies. No hazardous conditions or contamination were identified along the project alignment, but if any contamination is discovered during construction of the proposed project, the above mitigation will be implemented to ensure no adverse effects result from discovery and handling of such material. With implementation of the measures identified, potential exposures to accidental releases of hazardous substances can be managed at a level of less than significant adverse impact on the area's human population and environment.

c. L*ess than significant impact* – The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. There are schools within the general vicinity of the proposed facilities, including schools located within one-quarter mile of proposed facilities and pipelines as shown on Figure 2. Proposed wastewater treatment plant facility improvements would be constructed with a security fence to control entry. Any new chemical uses and related hazards at the sites are considered to be manageable without causing a substantial risk to the existing and future surrounding population, including the local schools. The only potential hazards associated with the pipelines would occur during construction. Implementation of mitigation measure VIII-1 is sufficient to mitigate construction-related hazards in the vicinity of schools.

d. *Less than significant impact with mitigation incorporation* – The only hazardous site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and within an approximately two mile radius of the proposed project area of impact is a State Response Site under the

oversight of the Department of Toxic Substances Control located at the Foster-Gardner site at 1577 1st Street in Coachella. The site historically housed manufacturing of pesticides and current site operations include storage of pesticides and fertilizers. Potential contaminants of concern on the site include wastes from the production of pesticides including ammonia, organochlorine pesticides and volatile organics. This State Response Site has no potential to impact or be impacted by the proposed project because of the distance between the Foster-Gardner site and the proposed area of impact.

There are numerous Leaking Underground Fuel Tank sites (LUFTs) and several Spills, Leaks, Investigation, and Cleanups sites (SLICs) throughout the City of Indio according to the State of California Envirostor Database. The only open case located within the area of potential effect is at the One Stop Shoppe located at 84051 Indio Boulevard in Indio which is under the regulatory oversight of the Colorado River Basin RWQCB (Region 7) to assess and remediate gasoline that may have affected the drinking water aquifer. Well monitoring is ongoing at the site.

The other sites that are listed as occurring within the area of potential effect of the proposed project are all cases where assessment and remediation have been completed and the regulatory case has been closed. These sites are: Indio Municipal Golf Course at 82040 Ave 42 (completed - case closed as of 9/16/2005); Texaco Big America at 84096 Indio Springs Drive (completed - case closed as of 3/31/1997); Kennedy Brothers Refrigeration at 84114 Indio Boulevard (completed - case closed as of 5/15/1997); Shell Oil Company at 43411 Monroe St (completed - case closed as of 1/30/1998) and Pan American (vacant lot) on Shields Road (completed - case closed as of 8/27/1992). While these cases have been closed by the regulatory authority, the presence of numerous sites raises the potential for the proposed project to encounter undetected areas with hazardous contamination. Additionally, the EPA Enviromapper lists 69 sites within the project vicinity that report to the EPA for generating, handling or transporting hazardous wastes and one facility that reports to the EPA for water discharges. Again, while there is no reason to expect that the presence of sites under regulatory oversight indicates that the proposed project will encounter contaminated areas, implementation of the following mitigation measure can reduce potential impacts to a less than significant level.

VII-2 For construction activities associated with the project that will expose the soil beneath previous developed areas, the construction contractor shall have a monitoring program installed which will identify any discolored soil or odors associated with hazardous contamination and initiate a measurement and, if required, a remediation program to prevent exposure of persons or the environment to adverse concentrations of contamination shall be implemented.

e. *Less than significant impact* – Portions of the pipelines proposed along 44th Ave/Fred Waring Drive in the western portion of the service area are located within the Bermuda Dunes Airport Influence Policy Area according to Figure 5 of the Western Coachella Valley Area Plan of the Riverside County General Plan. However, no parts of the project would be located within a safety zone. Neither temporary construction activities nor pipeline operations near the airport would pose a safety hazard for airport operations or for people residing or working in the project area. No potential exists to conflict with the local airport land use plan. No mitigation is proposed.

f. *Less than significant impact* – See response to (e) above.

g. *Less than significant impact* – The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan after construction. During construction activities, pipeline emplacement will occur within active roadways. Impact to roads would be temporary and less than substantial with implementation of mitigation outlined under transportation/traffic in Section XV of this initial study.

h. *No impact* – The proposed project is located in an area mapped as having low or no wildfire susceptibility according to Figure 13 of the Riverside County General Plan Western Coachella Valley Area Plan. As such there is no substantial risk that the proposed project would expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands

are adjacent to urbanized areas or where residences are intermixed with wildlands. The proposed project would provide additional water resources to the service area, which is considered beneficial to fire fighting efforts.

Conclusion

Based on the analysis and findings presented above, with incorporation of the recommended mitigation measures the hazards and hazardous materials issue does not pose any significant adverse impacts to the environment at any of the facility locations. Therefore, the hazards and hazardous materials issue will not be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
VIII. HYDROLOGY AND WATER QUALITY – Would the project:				
a) Violate any water quality standards or waste discharge requirements?	■			
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	■			
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation onsite or offsite?	■			
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?	■			
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	■			
f) Otherwise substantially degrade water quality?	■			

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	■			
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	■			
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	■			
j) Inundation by seiche, tsunami, or mudflow?	■			

SUBSTANTIATION:

a-j. *Potentially significant impact* – These issue areas will be further analyzed in an EIR.

Conclusion

Due to the potential for significant hydrology and water quality impacts, a detailed evaluation will be prepared and this issue will be included in the EIR for evaluation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
IX. LAND USE AND PLANNING – Would the project:				
a) Physically divide an established community?				■
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			■	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	■			

SUBSTANTIATION:

a. *No impact* – The proposed project would not physically divide an established community. It provides wastewater treatment and recycled water facilities to the existing community and helps conserve potable water by making recycled water more readily available for non-potable uses. The pipelines will

be located underground and the above-ground facilities will be within an existing WWTP compound or on a site (all four satellite treatment facility alternatives) that is not large enough to physically divide a community. No impact is expected and no mitigation is required.

b. *Less than significant impact* – California Government Code Section 53091 states that "…zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency." As such no conflict with City zoning ordinances would occur with project implementation. The facilities that would be installed at the existing WWTP would be located within the compound and the pipelines, which would be located underground, have no potential to conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project. The satellite treatment facility sites under consideration would not require a change of land use designation in the General Plan, but they would change the use of any of the sites from a vacant lot to water treatment facilities.

c. *Potentially significant impact* – The analysis of whether or not the proposed project would conflict with any applicable habitat conservation plan or natural community conservation plan is closely tied to the evaluation of biological resource impacts, and therefore, will be considered in conjunction with the biological impacts in the EIR.

Conclusion

Based on the analysis and findings presented above, the proposed project will not pose any significant adverse impacts to land use and planning issues, with the possible exception of the potential conflicts with applicable habitat conservation plans or natural community conservation plans. Therefore, the analysis of habitat conservation plans or natural community conservation plans will be the only land use and planning issue that will be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project, where it will be evaluated in conjunction with the biological resources issue.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
X. MINERAL RESOURCES – Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?			■	
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?			■	

SUBSTANTIATION (check ___ if project is located within the Mineral Resources Zone Overlay):

a&b. *Less than significant impact* – The Surface Mining and Reclamation Act of 1975 (SMARA) mandates the classification of lands containing valuable mineral deposits within the State in order to protect access to mineral resources from urban expansion or other irreversible actions. The resource designations consider the likelihood of construction aggregate deposits that meet State criteria for value and marketability based solely on geologic factors. The Board is not allowed to consider "existing land uses" as criteria in its classification of Mineral Resource Zones such that designations may occur on land that is already developed in such a way as to make it unsuitable for mineral production.

According to Figure 4.7-1 Mineral Resource Zones of the City of Indio General Plan, all of the City is mapped as Mineral Resource Zone 1 (MRZ-1) with the exception of the northern edge of the City, which includes all four sites under consideration for the satellite treatment facility and is mapped as MRZ-3. MRZ-1 indicates that there are no significant mineral deposits whereas MRZ-3 indicates that the available database is inadequate to determine whether significant mineral resources are present.

The project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. The majority of the facilities proposed as part of the project would be located in developed areas or within roadways and limited amounts of undeveloped land. Other portions of the project would be located in close proximity to existing residential development where mining operations, if ever warranted, would conflict with adjacent land uses. No significant adverse impact is expected, and no mitigation is proposed.

Conclusion

Based on the analysis and findings presented above, the proposed project does not pose any significant adverse impacts to mineral resource issues. Therefore, the mineral resource issue will not be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
XI. NOISE – Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	■			
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	■			
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	■			
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	■			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	■			
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	■			

SUBSTANTIATION

a-f. *Potentially significant impact* – These issue areas will be further analyzed in an EIR.

Conclusion

Due to the potential for significant noise impacts, a detailed evaluation will be prepared and this issue will be included in the EIR for evaluation.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
XII. POPULATION AND HOUSING – Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			■	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				■
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				■

SUBSTANTIATION:

a. *Less Than Significant Impact* – Implementation of the proposed project will not contribute to significant growth, specifically growth beyond that permitted by the general plans of land use jurisdictions in the project area as allocated in regional planning documents. The purpose of the proposed project is to provide a more reliable water supply and more efficient use of existing water supplies for existing, approved or planned for development within the project area. The purpose of the project is not to provide an additional source of water for that would facilitate growth beyond that which is planned for in the area general plans. Growth management and the allocation and direction of development are the responsibility of general purpose government (cities and counties). Utilities, including water purveyors, are responsible for providing adequate facilities to serve the projected growth at the state, regional and local levels.

General plans create a set of expectations regarding future land use and growth that may or may not occur depending upon the actual carrying capacity of the various utility and service resources required to meet future growth. The established planning process and the overall growth pressures are the primary causes of future growth, i.e. they induce the actual growth that occurs, and the various utilities, including water service providers, are effectively forced to create urban water management plans that can accommodate such growth, at least within the limits of current or future resources that may be available.

At present the water supply in the project area relies entirely on groundwater. The proposed project would provide an alternative method for providing supplemental water that will reduce reliance on nonrenewable groundwater.

b. *No impact* – The proposed project would not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere. No housing resources will be displaced by the proposed project, as all construction and operation activities will occur at locations without any housing. The pipeline routes will be primarily located within existing road rights-of-way, and wastewater treatment infrastructure will be located within an existing WWTP compound and on vacant land. No impact is identified and no mitigation is proposed.

c. *No impact* – The proposed project would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. The project has no potential to impact any existing housing or cause the displacement of people. No impact is identified and no mitigation is required.

Conclusion

Based on the analysis and findings presented above, the proposed project would not pose any significant adverse impacts to population and housing issues. Therefore, the population and housing issue will not be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
XIII. PUBLIC SERVICES – Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?			■	
b) Police protection?			■	
c) Schools?				■
d) Recreation/Parks?		■		
e) Other public facilities?				■

SUBSTANTIATION:

a. *Less than significant impact* – The proposed project would not have significant impacts on fire protection. The project would result in the modification or installation of wastewater treatment plants, recycled water pipeline and related facilities. The additional source of water provided by the project would have the potential to reduce demands on the existing water supply and provide and increased margin of security for meeting fire water flow requirements. The additional water supply would therefore be beneficial to fire protection efforts.

Electricity would be the power source for operation of the treatment plants and other equipment and a diesel generator for back-up emergency power would also be used. Any construction job, or ongoing operation and maintenance of a facility, can result in accidents and require emergency services. Such events are limited by following all applicable safety guidelines and procedures. Fencing around the

perimeter of the facilities would also limit access. No significant demand would be created that would require new fire fighting facilities. No significant impact is forecast to occur and no mitigation is required.

b. *Less than significant impact* – The proposed project facilities are not the kind of use that would typically attract criminal activity. Any construction activity can have accidents or thefts and require law enforcement services. Existing fencing around the perimeter of the VSD WWTP facilities would limit unauthorized access to this portion of the construction site. The proposed project would not place a significant demand on police protection such that new facilities would be required. No significant impact is forecast to occur, and no mitigation is required.

c. *No impact* – The proposed project would not generate many new long-term jobs or attract new residents to the area that would not occur without the project, so the no significant student generation would occur as a result of the project. No school facilities would be displaced by the proposed project. The proposed project reclaimed water could be applied to turf at area schools, but this would be a beneficial impact of project implementation. No negative impacts on nearby schools can be identified. No mitigation is required.

d. *Less than significant impact with mitigation incorporation* – One of the sites under consideration for a satellite treatment facility is within Posse Park. Development of a satellite treatment facility on this site would prevent a portion of Posse Park from being developed as parkland or from being used as passive parkland. Given that Posse Park is located on the northern edge of the City and that land north of the site is undeveloped natural lands, the loss of a small area of passive, undeveloped parkland at this location is less than significant. Information on the existing and planned for ratio of parkland to residents was not immediately available, therefore, the following mitigation is required to ensure that no significant impact occurs as a result of implementation of the project.

XIII-1 If the placement of a satellite treatment facility on a parcel designated as parkland would reduce the resident to parkland ratio below that which is planned for by the City, then the City and IWA will replace the acreage lost to a satellite treatment facility with comparable acreage at a 1:1 to be designated as parkland. As the City does not have an adopted standard for parkland, then the project would be required to replace parkland if the placement of satellite treatment facilities caused there to be fewer than 3 acres of parkland for every 1,000 City residents.

All of the proposed satellite treatment facility alternatives are located adjacent to golf courses, which as currently proposed would be able to receive recycled water for irrigation purposes as part of the proposed projects. The additional source of water that would be made available to the golf courses and to other parkland and recreational space, through the proposed project is considered a benefit of the project to recreation.

e. *No impact* – The proposed project would not generate many new long-term jobs or attract new residents to the area that would not occur without the project. No adverse impact to other public facilities is forecast to occur as a result of the project, and no mitigation is required. Beneficial impacts of the proposed project on public facilities would include the provision of sustainable water supply to the water serving agencies.

Conclusion

Based on the analysis and findings presented above, the proposed project would not pose any significant adverse impacts to public services. Therefore, the public services issue will not be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
XIV. RECREATION –				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				■
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?			■	

SUBSTANTIATION:

a. *No impact* – The proposed project would not increase the use of existing neighborhood and regional parks or other recreation facilities such that substantial physical deterioration of the facility would occur or be accelerated. The project is not forecast to cause any increase in demand for any recreational facilities in the project area since no increase in population is forecast to occur as a result of implementing the project. This finding applies to both the construction and operation period of the project. No mitigation is proposed.

b. *Less than significant impact* – The proposed project includes the possible development of a satellite treatment facility on a parcel of vacant land designated as parkland. As noted above, the proposed project includes no recreation facilities and will not increase the demand for recreational facilities. Mitigation measure XIII-1 ensures that there would remain adequate recreational facilities to serve the community and that the loss of undeveloped parkland as a result of the project would have a less than significant impact on recreational facilities in the project area. No mitigation is proposed.

Conclusion

Based on the analysis and findings presented above, the proposed project would not pose any significant adverse impacts to recreation. Therefore, the recreation issue will not be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
XV. TRANSPORTATION / CIRCULATION – Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			■	
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			■	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				■
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		■		
e) Result in inadequate emergency access?		■		
f) Result in inadequate parking capacity?				■
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			■	

SUBSTANTIATION:

a. *Less than significant* – The proposed project would the not cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

The proposed project will have its greatest impact on traffic during construction. Construction activities will result in an increase in traffic due to construction worker commuting and equipment and materials deliveries. A projected maximum of 100 vehicle trips per day attributable to construction of the proposed project are expected during construction. Relative to existing exiting traffic and traffic capacity, construction activity is not forecast to cause a significant increase in traffic.

Operation impacts on the circulation system attributable to the proposed project would be minimal. Overall, it is not anticipated that the project will require more than a 40 to 60 vehicle trips per day by employees and routine deliveries to the proposed facilities. Regarding the recycled water pipeline alignment, once the pipeline is emplaced, there should be little maintenance required such that little or

no traffic would be generated by the pipelines on a routine basis. Mitigation to address short-term construction impacts on traffic flow are provided below.

b. *Less than significant impact* – The project would not exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

As described above, the proposed project will not generate sufficient traffic during construction or operations to reduce the level of service on any of the roads that serve the project area. Therefore, the proposed project is not forecast to result in significant impacts, and no mitigation is required.

c. *No impact* – The project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. Construction and operation activities for the proposed project have no potential to affect any air traffic patterns. No impact can occur and no mitigation is required.

d. *Less than significant impact with mitigation incorporation* – The proposed project would not substantially increase hazards due to a design feature (i.e., sharp curves or dangerous intersections) or incompatible uses (i.e., farm equipment). The proposed project will only affect flow of traffic during construction, particularly along the pipeline alignments within and crossing existing roadways. No new permanent road hazards are forecast to occur from implementing the proposed project. During construction, potential road hazards will occur and mitigation will be required to control traffic in a safe manner along the pipeline route and to ensure adequate emergency access to all property along the pipeline alignments.

XV-1 The construction contractor will provide adequate traffic management resources, such as protective devices, flag persons, and police assistance for traffic control, to maintain safe traffic flow on local streets affected by facilities and pipeline construction at all times.

XV-2 The construction contractor will identify traffic hazards created by construction, such as rough road or potholes and will minimize total traffic and vehicle speed through such hazards.

XV-3 The construction contractor will ensure that traffic safety hazards, such as uncovered or unfilled open trenches, will not be left in roadways when construction personnel are not present, such as at nighttime and during weekends.

XV-4 The construction contractor will repair all roads adequately after construction to ensure that traffic can move in the same manner as before construction.

Implementation of the above measures will ensure that no substantial short-term traffic hazards will be caused by the proposed project.

e. *Less than significant impact with mitigation incorporation* – The proposed project would only have a potential to disrupt emergency access during construction. After construction, pipelines will be located underground and operational facilities will be located on parcels of land that would not conflict with provision of adequate emergency access. The following mitigation measure is required to ensure adequate emergency access during construction activities.

XV-5 At all times during construction, the contractor will ensure that emergency fire, police or medical vehicles are able to access all adjacent areas. Additionally, construction equipment or activities must not obstruct or hinder traffic that might be generated during an evacuation.

Implementation of the above measure will ensure that no substantial short-term impact on emergency access will be caused by the proposed project.

f. *No impact* – The proposed project would not result in inadequate parking capacity. The proposed project does not create a need for new parking capacity, other than that needed at the wastewater treatment plants. There is more than adequate room on the facility sites to provide adequate parking space for employees, vendors and visitors.

g. *Less than significant impact* – The proposed project would not conflict with adopted policies, plans, or programs supporting alternative transportation (i.e., bus turnouts, bicycle racks). Pipelines would be located underground after construction, and the traffic management mitigation measures XV-1 through XV-4 are adequate to ensure safe operation of alternative transportation during construction. Roadways impacted by construction will be repaired after emplacement of pipelines such that there is no hazard (abrupt road changes) to alternative transportation.

Figure 8 of the Riverside County General Plan Western Coachella Valley Area Plan show trails and bikeways in the project area. There is a Class I bike path/regional trail located along the canal along the freeway where a portion of pipeline is proposed as well as Class I bike path along the channel north of Posse Park. Mitigation measures XV-1 through XV-5 apply to all roadways, including bike paths/regional trails, and as such no additional mitigation is required to ensure that the proposed project would not conflict with alternative transportation.

Conclusion

Based on the analysis and findings presented above, the proposed project would not pose any significant adverse impacts to traffic and transportation. Therefore, the traffic and transportation issue will not be carried forward for evaluation in the environmental impact report (EIR) that will be prepared for this project.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
XVI. UTILITIES AND SERVICE SYSTEMS – Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	■			
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	■			
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	■			
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			■	
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				■
f) Be served by a landfill(s) with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	■			
g) Comply with federal, state, and local statutes and regulations related to solid waste?	■			

SUBSTANTIATION:

a. *Potentially significant impact* – The proposed project will be subject to mandatory wastewater discharge requirements from the Colorado River Regional Water Quality Control Board (Region 7), which must be met or the wastewater treatment facilities and ASR wells cannot operate. The proposed treatment methods for the recycled water have been specifically designed to meet the anticipated waste discharge requirements. Because this issue is closely tied to the hydrology and water quality analysis, it will be evaluated in the EIR in conjunction with this topic.

b. *Potentially significant impact* – The proposed project includes the construction and expansion of wastewater treatment facilities. It would not require the construction or expansion of water facilities. Some environmental effects from constructing this facility have been identified as having potentially significant adverse impacts and will be analyzed in an EIR, including air quality, biological resources, cultural resources, hydrology and water quality, and noise.

c. *Potentially significant impact* – Stormwater flows within the project area may be altered by installation of the pipelines, WWTP facilities or associated infrastructure. During construction, the construction/installation of the proposed facilities has a potential to contribute stormwater flows. Because the combined area of impact of all of the project components is larger than one acre, a NPDES general construction permit will have to be filed and a SWPPP and WQMP compiled and implemented with best management practices for short-term and long-term stormwater management. Therefore, based on the mandatory implementation of SWPPP and WQMP components, potential stormwater flows related to installing the proposed facilities will not cause any significant adverse water quality impacts within the project APE. After the pipelines are installed beneath roadways or across channels, no substantial adverse change in stormwater flows is forecast to occur due to operation of the proposed underground facilities. Because this issue is closely tied to the hydrology and water quality analysis, it will be evaluated in the EIR in conjunction with this topic.

d. *Less than significant impact* – The proposed project is the construction and installation of wastewater treatment and recycled water facilities, and does not include the need for substantial additional water supplies. Minimal amounts of potable water will be needed within the WWTPs for typical domestic uses and laboratory uses. Incremental potable water demand by the WWTPs attributable to the proposed project is forecast to be less than that of four or five equivalent dwelling units. Thus, no potential exists for significant adverse impact to water supplies from implementing this project. Other than meeting current water conservation requirements for fixtures in the new WWTP facilities, no mitigation is required.

e. *No impact* – The project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. The proposed project is the construction and installation of a new wastewater treatment plant facilities and related infrastructure. Therefore, the proposed project will not generate any wastewater or affect the treatment capacity of any existing wastewater treatment provider beyond that which is projected by and planned for in the proposed project description. No additional impact can occur, and no mitigation is required.

f&g. *Potentially significant Impact* – The volume of solid waste that will be generated during construction will be minor. During construction, it will consist of onsite vegetation that will be removed during site clearing and some construction waste generated during construction of the pipelines, wastewater treatment plants and associated infrastructure. The vegetative waste can be chipped and used as mulch or removed to a licensed municipal landfill. The proposed project's construction contractor will be required to comply with all regulations related to solid waste. Construction waste can be recycled or delivered to an appropriate landfill. Small quantities of municipal waste may be generated during operations. No further analysis of construction or municipal waste that may be generated by construction and operations is required as no significant impact is forecast to occur, and no mitigation is required.

Several of the processes that would be employed in the treatment of wastewater for the provision of recycled water would result in waste brine. Alternatives for brine management include sending it to a large system of local evaporation ponds, further treatment to increase finished water production and decrease brine volume thereby reducing the size of the evaporation ponds, or a regional brine management plan consisting of large evaporation ponds. Management of brine waste will be evaluated in the EIR as part of the hydrology and water quality analysis.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact or Does Not Apply
XVII. MANDATORY FINDINGS OF SIGNIFICANCE –				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	■			
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	■			
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	■			

SUBSTANTIATION:

a. *Potentially Significant Impact* – Potential impacts to biological and cultural resources will be evaluated in the EIR.

b. *Potentially Significant Impact* – The project will construct wastewater treatment and conveyance facilities to provide recycled water to portions of the IWA service area. This project does not rely on other development. No other water or wastewater improvements are associated with or reliant upon this project.

This document evaluated all CEQA issues contained in the latest Initial Study Checklist form. The evaluation determined that either no impact or less than significant impacts would be associated with the issues of: agricultural resources, minerals, population/housing, and recreation. No mitigation was proposed for these issues and potential impacts are neither individually nor cumulatively significant. For the issues of: aesthetics, hazards, public services and traffic/transportation all potential impacts were determined to be less than significant both individually and cumulatively with implementation of identified mitigation.

For the issues of: air quality, biological resources, cultural resources, hydrology/water quality, and noise all potential impacts were determined to be potentially significant and specified items will be addressed in the EIR. For the issues of geology/soils, land use, and utilities/service the impacts associated with many issues were determined to be less than significant both individually and cumulatively without mitigation or in some instances within geology/soils with implementation of identified mitigation, but each

issue also contained items that require further consideration in the EIR. The issue within geology/soils that requires further study is the potential for liquefaction associated with the project which will be evaluated in conjunction with the hydrology/water quality section of the EIR. The issue within land use that requires further study is the impact of the project on habitat conservation plans and natural community conservation plans, which will be evaluated in conjunction with the biological resources section of the EIR. The issues within utilities/service systems that require further study are wastewater discharge requirements, storm water facilities, and brine discharge, all of which will be evaluated in conjunction with the hydrology/water quality section of the EIR.

c. *Potentially Significant Impact* – The potential impacts to air quality, biological resources, cultural resources, hydrology/water quality, and noise have been determined as potentially significant impacts and these issues will all be evaluated in the EIR to be prepared for this project.

SUMMARY OF MITIGATION MEASURES

I-1 Any satellite treatment facility infrastructure shall be designed to blend with the character of the surrounding development. Improvements shall include fencing and exterior landscaping consistent with the character of the adjacent development. And components of the facility infrastructure that may be visible from adjacent properties shall be painted in non-reflective tones that blend with the surroundings.

I-2 A facilities lighting plan shall be prepared and shall demonstrate that glare from operating and safety night lights that may create light and glare affecting adjacent properties are sufficiently shielded to prevent light and glare from spilling off of project facilities. Lighting shall be directed towards the ground with shielding designed to prevent light from spilling skyward. The facilities lighting plan shall be implemented in conformance with the City of Indio guidelines, and it shall be reviewed and approved by the Authority staff prior to installation of night lighting.

VI-1 Comprehensive geotechnical investigations shall be required prior to engineering and design development or structural and/or substantial rehabilitation of structures identified under Risk Class I & II, e.g., public facilities, as identified below:

- Risk Class I & II, Structures Critically Needed after Disaster: Structures that are critically needed after a disaster include important utility centers, fire stations, police stations, emergency communication facilities, hospitals, and critical transportation elements such as bridges and overpasses and smaller dams.
  Acceptable Damage: Minor non-structural; facility should remain operational and safe, or be suitable for quick restoration of service.
- Risk Class III: High occupancy structures; uses are required after disasters (i.e., places of assembly such as schools and churches).
  Acceptable Damage: Some impairment of function acceptable; structure needs to remain operational.
- Risk Class IV, Ordinary Risk Tolerance: The vast majority of structures in urban areas; most commercial and industrial buildings, small hotels and apartment buildings, and single family residences.

VI-2 Construction specifications will include appropriate measures for stabilizing excavations (such as covering soil piles with plastic or using spray on soil stabilizers to control fugitive dust) based on recommendation of project geotechnical studies.

VI-3 Trenches will remain open for as short a time as possible.

VI-4 Soils, where exposed, will be stabilized with hay bales or aggregate cover.

VI-5 Construction specifications will identify proper compaction for backfilled soils.

VII-1 All spills or leakage of petroleum products during construction activities will be remediated in compliance with applicable state and local regulations regarding cleanup and disposal of the contaminant released. The contaminated waste will be collected and disposed of at an appropriately licensed disposal or treatment facility.

VII-2 For construction activities associated with the project that will expose the soil beneath previous developed areas, the construction contractor shall have a monitoring program installed which will identify any discolored soil or odors associated with hazardous contamination and initiate a measurement and, if required, a remediation program to prevent exposure of persons or the environment to adverse concentrations of contamination shall be implemented.

XIII-1 If the placement of a satellite treatment facility on a parcel designated as parkland would reduce the resident to parkland ratio below that which is planned for by the City, then the City and IWA will replace the acreage lost to a satellite treatment facility with comparable acreage at a 1:1 to be designated as parkland. As the City does not have an adopted standard for parkland, then the project would be required to replace parkland if the placement of satellite treatment facilities caused there to be fewer than 3 acres of parkland for every 1,000 City residents.

XV-1 The construction contractor will provide adequate traffic management resources, such as protective devices, flag persons, and police assistance for traffic control, to maintain safe traffic flow on local streets affected by facilities and pipeline construction at all times.

XV-2 The construction contractor will identify traffic hazards created by construction, such as rough road or potholes and will minimize total traffic and vehicle speed through such hazards.

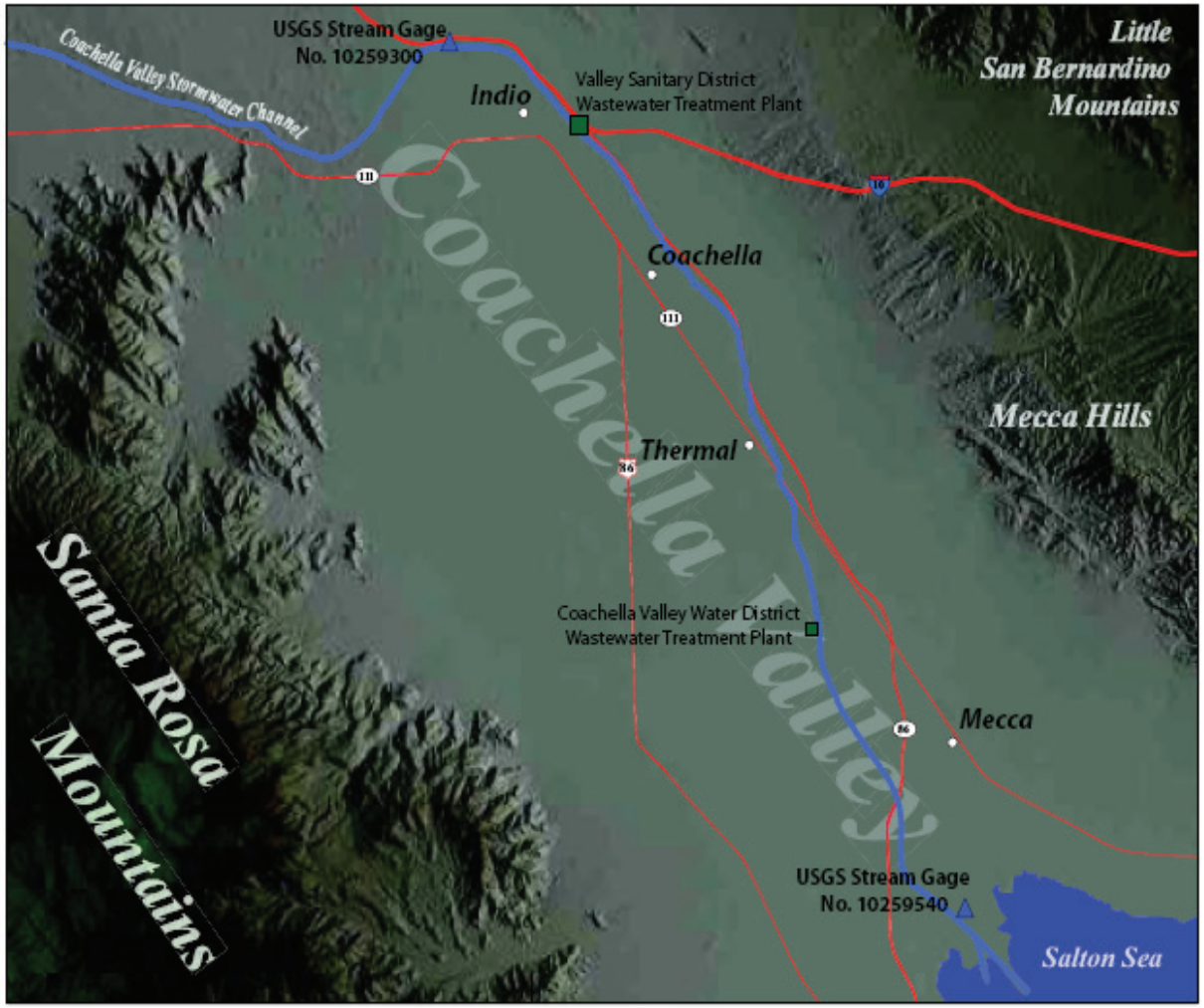
XV-3 The construction contractor will ensure that traffic safety hazards, such as uncovered or unfilled open trenches, will not be left in roadways when construction personnel are not present, such as at nighttime and during weekends.

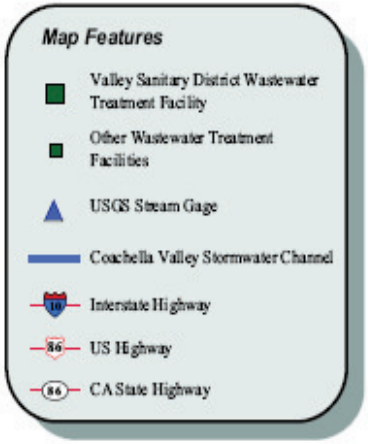
XV-4 The construction contractor will repair all roads adequately after construction to ensure that traffic can move in the same manner as before construction.

XV-5 At all times during construction, the contractor will ensure that emergency fire, police or medical vehicles are able to access all adjacent areas. Additionally, construction equipment or activities must not obstruct or hinder traffic that might be generated during an evacuation.

FIGURES

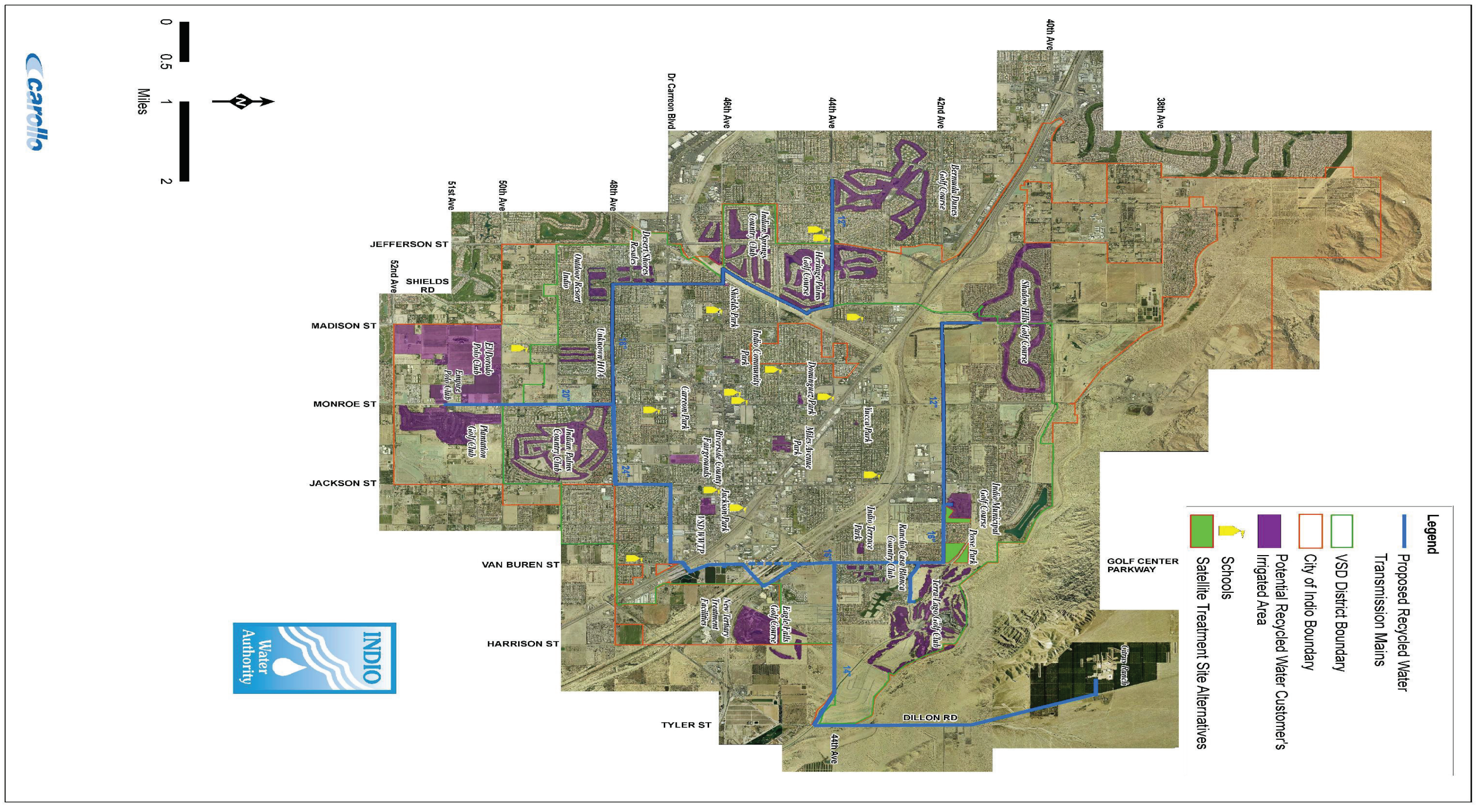
FIGURE 1
Regional Location





Source: Thomas Harder & Co. Groundwater Consulting

FIGURE 2
City Boundaries and VSD Facility Locations



Source: Carollo Engineers

FIGURE 3
Conceptual Site Layout of the Tertiary Filtration System

Source: Carollo Engineers

FIGURE 4
Preliminary Conceptual Site Layout of the Tertiary MF System

Source: Carollo Engineers

FIGURE 5
Conceptual Layout of the MBR System

Source: Carollo Engineers

FIGURE 6
Preliminary Conceptual Layout of the Groundwater Recharge Treatment Facility

Source: Carollo Engineers

APPENDIX 1

CITY OF INDIO
INDIO WATER AUTHORITY
TECHNICAL MEMORANDUM NO. 2

WATER BALANCE STUDY

DRAFT
DECEMBER 2009

Thomas Harder & Co.
Groundwater Consulting

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1.0 Introduction

This technical memorandum (TM) presents an evaluation of the water balance associated with discharge of treated wastewater from the Valley Sanitary District (VSD) wastewater treatment plant (WWTP) near Indio, California (see Figure 1). Currently, VSD discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel, which is an unlined drainage that eventually discharges into the Salton Sea, located approximately 13 miles downstream. The Indio Water Authority (IWA) proposes to divert a portion of the VSD's discharge from the river channel for beneficial uses within their service area.

1.1 Purpose and Scope

The purpose of this TM is to present an evaluation of potential impacts to the surface water hydrology and groundwater environment if a portion of the water currently discharged to the Coachella Valley Stormwater Channel is diverted for other uses. The area of the investigation (hereafter referred to as the "Study Area") extends from the City of Indio to the Salton Sea (see Figure 1).

The scope of work to address the objective of the investigation included:

- A review of water resource reports, hydrogeological data and historical wastewater discharge data for the Indio area;
- An evaluation of the current water balance for the wastewater discharge; and
- An analysis of potential changes in the water balance if the discharge is diverted

1.2 Sources of Data

- VSD monitoring records and reports
- United States Geological Survey (USGS) stream gage data
- California Irrigation Management Information System (CIMIS) weather station data
- IWA reports and well records

A complete list of references is provided at the end of this TM.

Indio Water Authority

22-Dec-09

0 1.5 3 Miles

NAD 27 UTM Zone 11 N.
Central Meridian: -117

N

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Recycled Water Diversion - Water Balance Study

Map Features

- Valley Sanitary District Wastewater Treatment Facility
- Other Wastewater Treatment Facilities
- USGS Stream Gage
- Coachella Valley Stormwater Channel
- Interstate Highway
- US Highway
- CA State Highway

Area Setting

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Study Area
Figure 1

2.0 Study Area Setting

The Study Area is located within the southern portion of the Coachella Valley of south central Riverside County, California (see Figures 1 and 2). The Coachella Valley is an elongated northwest/southeast trending lowland area that represents the landward extension of the Gulf of California. In the Study Area, the valley is bound on the northeast by the Little San Bernardino Mountains and Mecca Hills and on the southwest by the Santa Rosa Mountains (see Figure 1). The climate of this area is typical of the desert with average annual precipitation of approximately 3 inches/yr (National Climate Data Center, 2009) and an evapotranspiration rate of greater than 70 inches/yr (CIMIS, 2009).

2.1 Surface Water

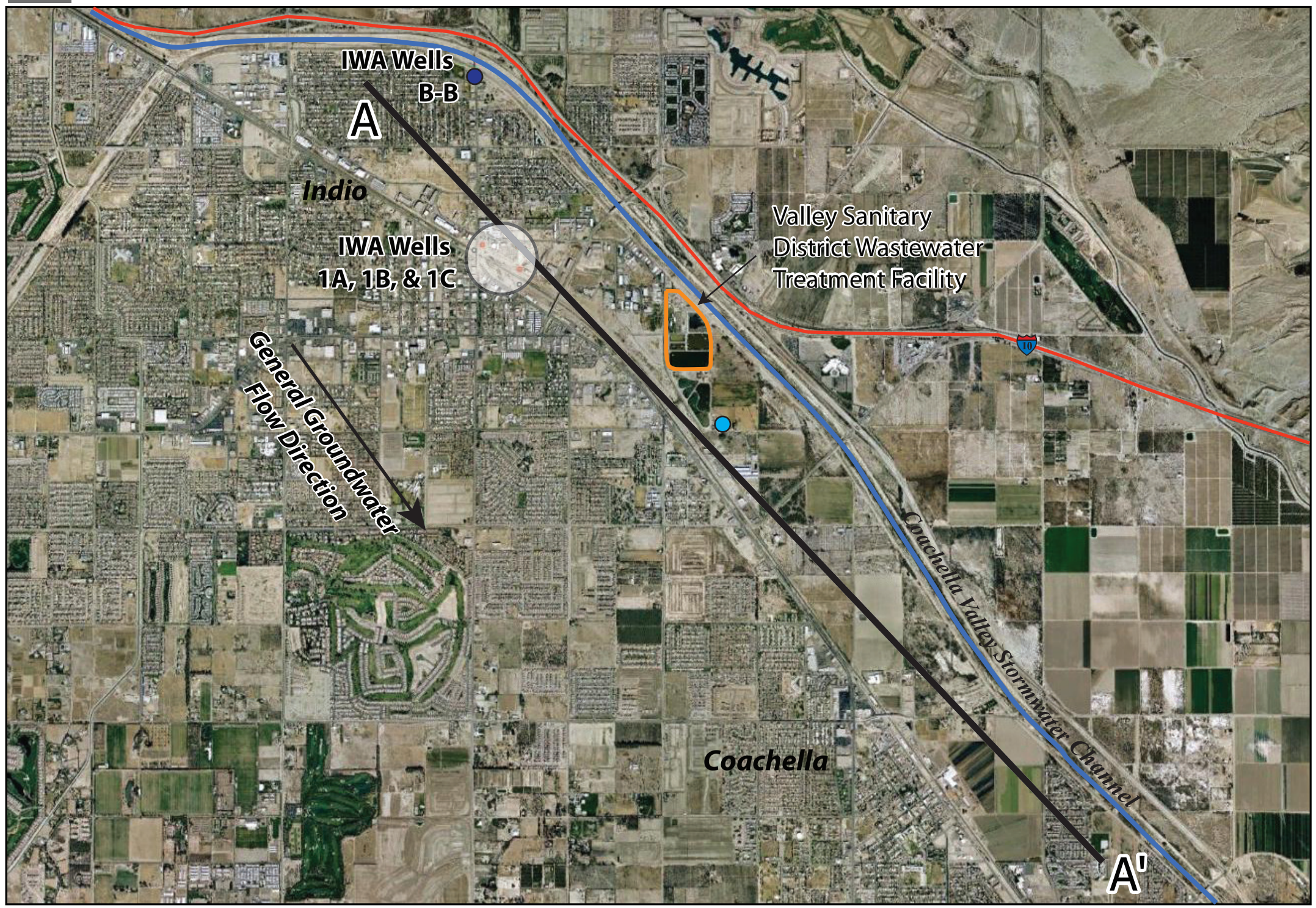
The primary surface water feature draining the area is the Coachella Valley Stormwater Channel, which originates in the southern San Bernardino Mountains at the north end of the valley and drains through the Study Area to the Salton Sea. The channel is dry most of the time, flowing only during the rainy season and during periods of prolonged precipitation. South of Indio, surface flow in the channel is primarily from treated wastewater discharge and agricultural irrigation return flow. Average annual surface water flow at the United States Geological Survey (USGS) stream gage at Indio (located approximately 1.5 miles upstream of the VSD point of discharge to the channel; see Figure 1) is approximately 2,700 acre-ft/yr (USGS, 2009). Average annual surface water flow at the USGS stream gage immediately north of the Salton Sea is approximately 79,000 acre-ft/yr (Tetra Tech, 2000). The increase in downstream surface flow in the channel will be discussed later in this TM.

2.2 Geology

The Coachella Valley is a fault bounded lowland depression that represents the northern extension of the Salton Trough. The most prominent fault in the Study Area is the San Andreas Fault Zone, which trends in a northeast-southwest direction through the north-central portion of the valley. The mountains surrounding the valley consist primarily of pre-Tertiary igneous and metamorphic rock. Rapid subsidence of the valley floor during geologic time (last 12 million years; Sneed and Brandt, 2007) and subsequent sedimentation has resulted in the alluvial basin that exists today. The maximum depth of alluvial sediments has been estimated to be

Indio Water Authority

22-Dec-09



0 1.5 3 Miles

NAD 27 UTM Zone 11 N.
Central Meridian: -117

N

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Recycled Water Diversion - Water Balance Study

Map Features

- Municipal Well
- Private Well
- Interstate Highway
- Valley Sanitary District Wastewater Treatment Facility
- Coachella Valley Stormwater Channel
- Cross Section A - A' (see Figure 3)

Area Setting

DRAFT

Detailed Study Area

Figure 2

approximately 12,000 ft although only the upper approximately 2,000 ft of sediments are water-bearing (DWR, 1979).

2.3 Hydrogeology

The Study Area is located within the Indio Subbasin of the regional Coachella Valley Groundwater Basin (DWR, 2003). The southern portion of the Indio Subbasin (i.e. the Study Area) has also been referred to as the Lower Whitewater River Subbasin (CVWD, 2005). In general, the aquifer system in the Lower Whitewater River Subbasin consists of alluvial fan deposits interbedded with lacustrine sediments consisting of thick layers of relatively impermeable clay and silt. Three principal aquifers have been identified in the Study Area: a shallow semiperched aquifer, an upper aquifer, and a lower aquifer (see Figure 3). The upper and lower aquifers are separated by a confining layer of clay and silt (i.e. aquitard) that is approximately 100 ft thick in the Indio area.

Historical groundwater elevation contour maps show groundwater flowing in a southeasterly direction in approximately the same direction as surface flow in the Coachella Valley Stormwater Channel (Huberty, Pillsbury and Sokoloff, 1948; Moreland, 1975). Groundwater levels directly beneath the VSD treatment plant, which are attributed to the semi-perched aquifer, are between 40 and 60 ft below ground surface (bgs) (Leighton Consulting, Inc., 2006). Groundwater levels in the upper aquifer are generally between approximately 90 and 100 ft bgs (Sneed and Brandt, 2007). Groundwater levels in the lower aquifer are reported to be 20 to 40 ft deeper than the upper aquifer (Moreland, 1975). For both the upper and lower aquifer, groundwater levels are declining at a similar rate of 0.5 to 1.5 ft per year.

Average annual natural groundwater recharge to the Indio Subbasin has been estimated to be approximately 49,000 acre-ft/yr (Black & Veatch, 2008).

Groundwater quality in the upper aquifer in the Indio area has been impacted by historical land use but is generally suitable for use as a source of municipal water supply (see Table 1). Total dissolved solids (TDS) concentrations in this aquifer generally range from 200 to 600 milligrams per liter (mg/L). The maximum contaminant level (MCL) for TDS is 500 mg/L. Nitrate concentrations in this aquifer generally range from 0.2 to 1.3 mg/L (as nitrogen) although concentrations as high as 6 mg/L have been detected in some wells. The MCL for nitrate is 10 mg/L. By comparison, TDS concentrations in the lower aquifer are generally 200 mg/L or

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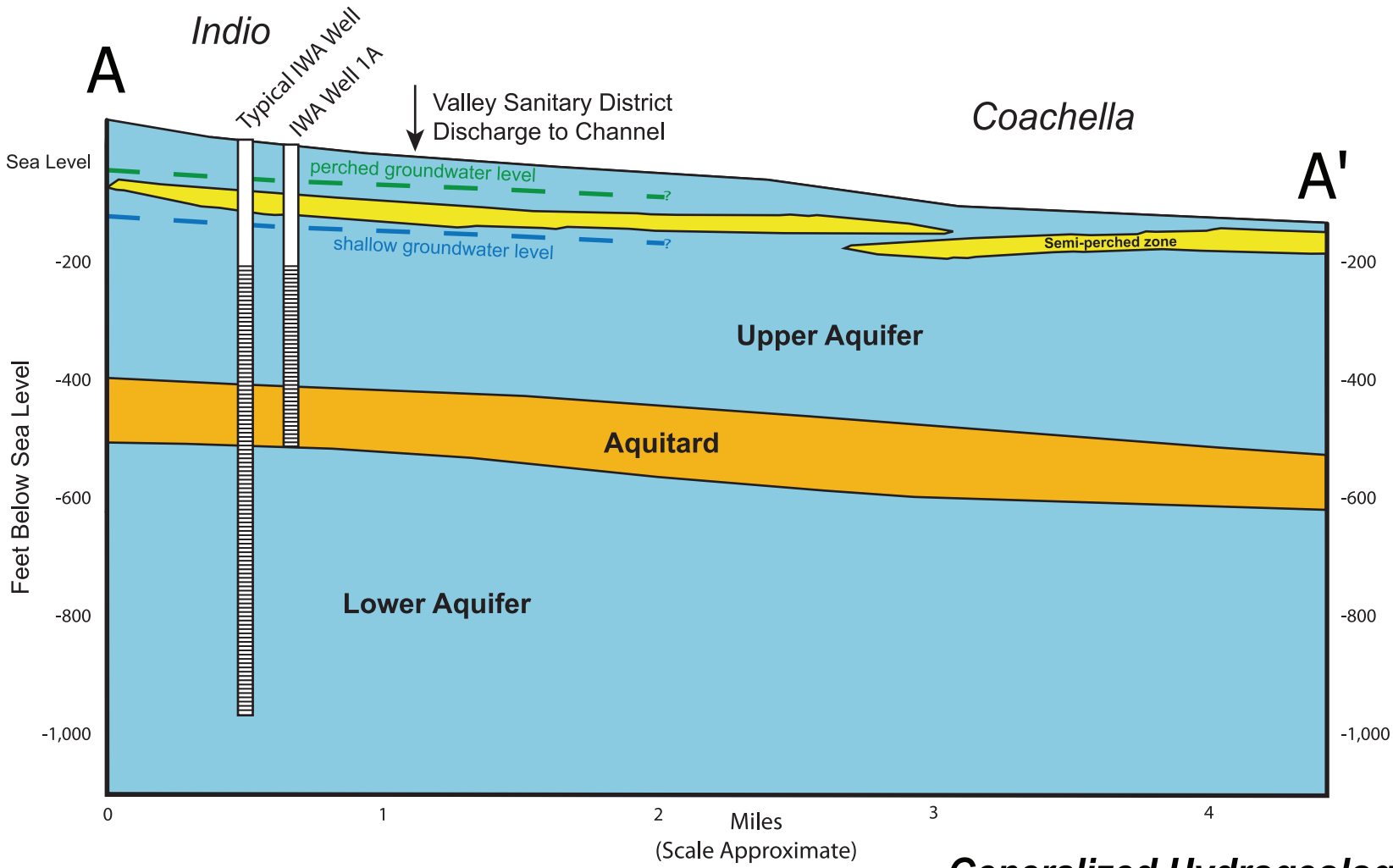
Recycled Water Diversion - Water Balance Study

Indio Water Authority



Generalized Hydrogeologic Cross Section

Figure 3

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Upper Aquifer Groundwater Quality

Date	Upgradient IWA Wells						Downgradient Private Well	
	Well 1A		Well 1B		Well 1C			
	Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	TDS (mg/L)
Mar-86	1.58	225	0.68	220	0.45	190	na	na
Jul-87	0.23	na	1.13	na	na	na	na	na
Jul-89	0.23	250	0.68	335	0.23	220	na	na
Feb-92	0.68	241.4	0.99	281.6	0.81	187	na	na
Mar-95	1.13	345	0.68	425	0.68	240	na	na
Feb-98	0.56	304	0.79	275	0.85	239	na	na
May-01	0.9	390	0.9	240	0.9	260	na	na
Apr-02	0.79	na	1.08	na	1.02	na	na	na
Dec-02	0.52	na	1.08	na	0.97	na	na	na
Mar-04	0.55	360	0.84	270	0.95	290	na	na
Sep-04	0.82	430	1.19	600	0.99	280	na	na
Sep-05	0.84	na	0.99	na	0.99	na	na	na
Jan-06	1.2	na	1.33	504	1.2	na	na	na
Sep-06	na	na	1.29	na	0.97	286	na	na
Sep-07	na	na	1.08	432	0.86	292	na	na
Oct-08	na	na	1.08	na	0.9	na	0.36	237
Jul-08	na	na	na	na	na	na	0.36	221
Apr-08	na	na	na	na	na	na	0.38	200
Jan-08	na	na	na	na	na	na	0.36	456
Apr-09	na	na	na	na	na	na	0.34	226
Jan-09	na	na	na	na	na	na	0.36	239

Notes:
na = data not available
TDS = total dissolved solids
mg/L = milligrams per liter

less and nitrate concentrations are less than 1.5 mg/L. Elevated TDS and nitrate concentrations in the upper aquifer are attributed to historical agricultural land use in the area (Moreland, 1975).

TDS and nitrate concentrations in groundwater from a private well near the VSD wastewater treatment plant (WWTP) does not show evidence of impact from groundwater recharge associated with discharge of treated wastewater to the Coachella Valley Stormwater Channel. This well is completed within the upper aquifer and is located directly downgradient of the treatment facility (see Figure 2). TDS concentrations in water from this well generally range from 200 to 240 mg/L. Nitrate concentrations range from 0.34 to 0.36 mg/L. These concentrations are below TDS and nitrate concentrations measured in the discharge to the river channel (see Section 4.3), and suggest that groundwater recharge from beneath the channel is minimal in the vicinity of the WWTP.

3.0 Components of Surface Water Flow in the Coachella Valley Stormwater Channel Channel

There are multiple sources of surface water flow within the Coachella Valley Stormwater Channel between Indio and the Salton Sea. In addition to natural stormwater runoff, the river receives inflow from discharge from two wastewater treatment plants and irrigation return flow via agricultural drains.

Historical surface water flow in the Study Area portion of the Coachella Valley Stormwater Channel has been recorded from USGS stream gages at Indio and near the Salton Sea (see Figure 1). Surface water flow through the USGS stream gage at Indio (located approximately two miles upstream of the VSD point of discharge) averages approximately 2,700 acre-ft/yr, based on stream flow records for the period 1967 to 2008 (USGS, 2009). The Coachella Valley Stormwater Channel between this stream gage and the VSD point of discharge is usually dry and the flow through the gage is likely attributed to stormwater runoff. Surface water flow at the USGS station near the Salton Sea (approximately 13 miles downstream of the VSD point of discharge) averages approximately 79,000 acre-ft/yr (Tetra Tech, 2000).

3.1 Wastewater Discharge

Discharge of treated wastewater into the Coachella Valley Stormwater Channel occurs at two locations within the Study Area: the VSD WWTP near Indio and the Coachella Valley Water District (CVWD) WWTP near Thermal. In 2008, the VSD discharged approximately 7,000 acre-ft to the river channel at their point of discharge near Indio (see Tables 2 and 3). The CVWD WWTP near Thermal generates more than 5,000 acre-ft/yr of treated wastewater although it is reported that most of this water is recycled for other uses (Black & Veatch, 2008). Thus, the total wastewater discharge to the Coachella Valley Stormwater Channel ranges from 7,000 to 12,000 acre-ft/yr, depending on how much water CVWD diverts for other uses.

3.2 Agricultural Irrigation Return Flow

The most significant source of flow in the Coachella Valley Stormwater Channel between Indio and the Salton Sea occurs as irrigation return flow via agricultural drains along the river channel. Given the large discrepancy between the total contributions of surface water flow from

Components of Surface Water Flow in the Coachella Valley Stormwater Channel

Source	Flow (acre-ft)
Total Average Annual Flow Upstream of VSD Discharge[1]	2,700
VSD WWTP Discharge (2008)	7,000
Coachella Valley Water District WWTP (2004)	5,300
Agricultural Drains	na
Total Average Annual Whitewater River Discharge to Salton Sea[2]	79,000

Notes:
na = data not available
VSD = Valley Sanitary District
WWTP = Wastewater Treatment Plant
[1] USGS Stream Gage 10259300 Whitewater River at Indio
[2] USGS Stream Gage 10259540 Whitewater River near Mecca

Monthly and Average Daily Discharge to the Coachella Valley Stormwater Channel
Valley Sanitary District Wastewater Treatment Plant

Year	Month	Activated Sludge Process		Oxidation Pond/Wetland Process		Total Discharge		Annual Total (acre-ft)
		Monthly Discharge (mg)	Average Daily Discharge (mgd)	Monthly Discharge (mg)	Average Daily Discharge (mgd)	Total Monthly Discharge (mg)	Average Daily Discharge (mgd)	
2008	Jan	129.7	4.18	83.56	2.70	213	6.88	7,026
	Feb	110.9	3.96	80.75	2.88	192	6.84	
	Mar	116.6	3.76	57.604	1.86	174	5.62	
	Apr	129.1	4.30	39.015	1.30	168	5.60	
	May	143.9	4.64	44.624	1.44	189	6.08	
	Jun	147.5	4.92	37.612	1.25	185	6.17	
	Jul	136.2	4.39	54.655	1.76	191	6.16	
	Aug	134.3	4.33	58.64	1.89	193	6.22	
	Sep	136.8	4.56	44.048	1.47	181	6.03	
	Oct	139.3	4.49	56.439	1.82	196	6.31	
	Nov	141.74	4.72	56.12	1.87	198	6.60	
	Dec	147.3	4.75	62.23	2.01	210	6.76	
2009	Jan	147.7	4.76	64.02	2.07	212	6.83	
	Feb	137.6	4.91	56.46	2.02	194	6.93	
	Mar	151.2	4.88	46.281	1.49	197	6.37	
	Apr	142.5	4.75	37.834	1.26	180	6.01	
	May	147.6	4.76	30.885	1.00	178	5.76	
	Jun	144.9	4.83	24.782	0.83	170	5.66	
	Jul	151.96	4.90	33.928	1.09	186	6.00	
	Aug	146.66	4.73	34.848	1.12	182	5.86	

Notes:
mg = million gallons
mgd = million gallons per day

stormwater runoff and treated wastewater discharges (up to approximately 15,000 acre-ft/yr) and the total flow measured at the stream gage near the Salton Sea (average of 79,000 acre-ft/yr), it is likely that agricultural return flow is the dominant source of discharge to the river downstream of Indio.

3.3 Evapotranspiration Losses along the Coachella Valley Stormwater Channel

Although the evapotranspiration (ET) rate in the Study Area is very high, the total loss of water from the channel is a relatively minor component of the overall water balance of the Coachella Valley Stormwater Channel. As described earlier, the ET rate in the Study Area is approximately 70 inches/yr, based on data from a CIMIS station in Indio (CIMIS, 2009). When this ET rate is applied to the approximate riparian area of the Coachella Valley Stormwater Channel, which is estimated to cover approximately 370 acres between the VSD point of discharge and the Salton Sea, the resulting ET loss from surface water is approximately 2,200 acre-ft/yr. This represents approximately three percent of the total surface water flow to the Salton Sea via the Coachella Valley Stormwater Channel.

3.4 Potential Groundwater Recharge from VSD Discharge to the Coachella Valley Stormwater Channel

Recharge of the aquifer system from surface water flow associated with VSD discharges to the Coachella Valley Stormwater Channel is also expected to be a minor component of the overall water balance. Infiltration rates beneath ephemeral stream channels in desert environments have been estimated to range from 0.0002 to 0.001 ft/day (Stonestrom et al., 2003). However, in the case of the Coachella Valley Stormwater Channel, estimated infiltration is complicated by the fact that the channel is flowing perennially and has become vegetated. Infiltration beneath the channel is expected to be higher than an ephemeral stream because it is flowing. However, the permeability of the channel bottom is also expected to be reduced from vegetation buildup (Blasch and Ferre, 2004), as is the case with the channel downstream of the VSD point of discharge. Assuming infiltration rates ranging from 0.1 to 0.5 ft/day and an effective channel area along a 1.5 mile reach of the river directly downstream of the VSD point of discharge, the amount of groundwater recharge beneath the channel associated with VSD discharges would

range from approximately 3 to 16 acre-ft/yr. These estimates of groundwater recharge are less than one percent of the total VSD WWTP discharge to the channel (7,000 acre-ft/yr).

4.0 Potential Hydrological and Hydrogeological Impacts from Reducing VSD Discharge to the Coachella Valley Stormwater Channel

4.1 Potential Changes in Surface Water Flow

The greatest impact to surface water flow in the Coachella Valley Stormwater Channel from reducing VSD discharges to the channel would likely be limited to the reach of the channel directly downgradient of the VSD point of discharge. With increasing distance downstream, inflow contributions from agricultural irrigation return flow become the dominant contribution of flow to the channel. The available data does not allow for a detailed accounting of return flow accumulation. However, based on review of aerial photos showing irrigated fields along the channel, there are likely irrigation return flow contributions as close as 1.5 miles downstream of the VSD point of discharge. Thus, the greatest impact to surface water flow in the Coachella Valley Stormwater Channel from reductions in VSD discharges would be in the 1.5 mile reach downstream of the point of discharge.

4.2 Potential Changes in Groundwater Recharge

Diverting VSD treated wastewater discharge from the Coachella Valley Stormwater Channel for other beneficial uses in the Indio area would not have an adverse impact on the groundwater resources of the area. In the event that all of the VSD discharge was diverted for other uses, the maximum reduction in groundwater recharge is estimated to be on the order of 16 acre-ft/yr, which is a fraction of the estimated natural recharge to the Indio Subbasin (49,000 acre-ft/yr). However, irrigation uses for the diverted water would result in return flow to the groundwater, which would offset the groundwater recharge beneath the channel and, in some cases, could exceed the current groundwater recharge. Also, if the recycled water is used for artificial recharge in engineered and maintained surface spreading basins, most of the VSD recycled water would recharge the groundwater substantially increasing the groundwater resources of the Indio Area.

4.3 Potential Changes in Groundwater Quality

TDS and nitrate concentrations in treated wastewater from the VSD WWTP are not significantly higher than concentrations of these constituents in the shallow groundwater in the Indio area (see Table 4). Based on observations of TDS and nitrate concentrations in the private well immediately downgradient of the treatment facility, there is no evidence that current discharges are adversely impacting the groundwater quality, which is consistent with the low estimates of groundwater recharge. Thus, reducing or eliminating VSD discharges to the Coachella Valley Stormwater Channel is not expected to impact the quality of groundwater in the area.

4.4 Potential Changes in Surface Water Flow to the Salton Sea

Reducing or eliminating VSD flow contributions to the Coachella Valley Stormwater Channel would have a negligible impact on inflow to the Salton Sea. The 79,000 acre-ft/yr of Coachella Valley Stormwater Channel flow to the Salton Sea accounts for approximately six percent of the total inflow to this water body, which is estimated to be 1,346,000 acre-ft/yr (Tetra Tech, 2000). Accounting for losses due to ET, the 7,000 acre-ft/yr of discharge to the channel is expected to be six to eight percent of the total Coachella Valley Stormwater Channel discharge to the Salton Sea and accounts for less than one half of one percent of the total inflow to the Salton Sea.

Valley Sanitary District Wastewater Treatment Plant Water Quality

Year	Month	Representative Sample From Combined Discharge		Upstream Receiving Water Monitoring	Downstream Receiving Water Monitoring
		Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	Nitrate. as N (mg/L)
2008	Jan	1.4	450	No upstream flow	1.8
	Feb	2.5	462		2.3
	Mar	1.1	456		1.4
	Apr	1.9	429		0.2
	May	0.7	476		0.14
	Jun	0.5	462		0.18
	Jul	nd	483		nd
	Aug	0.16	455		nd
	Sep	1.3	476		nd
	Oct	nd	409		nd
	Nov	0.43	446		0.18
	Dec	3.4	455		2.3
2009	Jan	3.4	455		2.9
	Feb	1.4	435		0.79
	Mar	4.7	454		4
	Apr	1.4	442		0.88
	May	1.5	444		0.99
	Jun	0.14	434		nd
	Jul	nd	483		nd
	Aug	nd	383		0.27

Notes:
nd = nondetect
mg/L = milligrams per liter

5.0 Summary and Conclusions

Based on the data and analysis presented in this TM, the following conclusions have been reached:

- The VSD currently discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel near Indio;
- The VSD discharge to the channel is one of numerous flow contributions to the channel, which include stormwater runoff, other treated wastewater discharges, and irrigation return flow from agriculture;
- By process of elimination, agricultural irrigation return flow appears to be the greatest contribution of flow to the Coachella Valley Stormwater Channel between Indio and the Salton Sea;
- The first observable irrigation return flow to the channel occurs approximately 1.5 miles downstream of the VSD point of discharge;
- Groundwater recharge beneath the Coachella Valley Stormwater Channel that is attributable to VSD discharges is estimated to range from approximately 3 to 16 acre-ft/yr;
- The greatest impact to surface water flow in the Coachella Valley Stormwater Channel would be in the first 1.5 miles downstream of the VSD point of discharge;
- Diverting VSD discharge from the Coachella Valley Stormwater Channel for other beneficial uses in the Indio area would not have an adverse impact on the groundwater resources of the area;
- Reducing or eliminating VSD discharges to the Coachella Valley Stormwater Channel is not expected to impact the quality of groundwater in the Indio area; and
- Reducing or eliminating VSD flow contributions to the Coachella Valley Stormwater Channel would have a negligible impact on inflow to the Salton Sea.

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APPENDIX 2

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CITY OF INDIO
INDIO WATER AUTHORITY
WATER RECLAMATION FACILITIES FOR REUSE AND GROUNDWATER RECHARGE – PHASE 1 ENVIRONMENTAL PROGRAM

TECHNICAL MEMORANDUM NO. 1
MARKET AND DEMAND ASSESSMENT

January 2010

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CITY OF INDIO / INDIO WATER AUTHORITY
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MARKET AND DEMAND ASSESSMENT

1.0 INTRODUCTION

This technical memorandum (TM) is prepared for the Indio Water Authority (IWA) in partial fulfillment of the agreement between the IWA and Carollo Engineers entitled "Water Reclamation Facilities for Reuse and Groundwater Recharge – Phase I Environmental Program. This TM presents the results of a market and demand assessment of the potential large recycled water customers that could use recycled water produced by the Valley Sanitary District (VSD) wastewater treatment plant (WWTP). Task 2 of the scope of work is accomplished with this TM and includes the tasks summarized below:

- Task 2.1 – Identify major turf irrigation customers that may become reuse irrigation customers.
- Task 2.2 – Quantify the amount of water that is used by these potential recycled water customers.
- Task 2.3 – Conduct a field investigation of the major customers to identify issues that may need to be addressed to provide recycled water, and to identify potential connection locations.
- Task 2.4 – Prepare a map showing IWA and VSD boundaries, potential large reuse customer locations, and the location of a backbone piping system to deliver the recycled water.

2.0 POTENTIAL CUSTOMERS

Large water users for irrigation in Indio include golf courses, polo clubs, parks, and homeowner's associations (HOAs). Potential recycled water customers were obtained by reviewing customer lists from previous studies, dicussions with IWA staff, and reviewing aerial photographs. A list of possible large recycled water users was developed, and site visits were made to those water users who responded to telephone inquiries. In addition to the customers that have been identified in this TM, there are several turf areas at schools that are large enough to be considered potential small recycled water customers. Table 1 lists the potential large customers and their contact information, where available.

Table 1 Potential Recycled Water User Contact Information

Name	Contact Name	Telephone Number	Address	Golf Course Size
Heritage Palms Golf Club1	Robert (Bob) White	**760-265-7447** 760-772-7334	44-291 Heritage Palms Drive South, Indio, CA 92201-2713	18-hole, 6,727 yards
Indio Municipal Golf Course	Kerry Lee	**760-578-9241** 760-347-9156	83-040 Avenue 42 Indio, CA 92201	18-hole, 3,004 yards
Rancho Casa Blanco Country Club & HOA	Mr. Stone	**760-342-9866** 760-347-1999	84-136 Avenue 144, Indio, CA 92203	18-hole, 1,302 yards
Terra Lago Golf Club	Tom Russell	**760-464-8151**, 760-775-2000	84-000 Landmark Parkway, Indio, CA 92203	36-hole, 14,352 yards
Indian Palms Country Club		**760-342-3432**, 760-775-4448	48-630 Monroe Street, Indio, CA 92201	27-hole, 10,061 yards
Indian Springs Country Club	Alfredo Alcocer	**760-772-4077** 760-200-8988	79-940 Westward Ho Drive, Indio, CA 92201	18-hole, 6,404 yards
Plantation Golf Club	Scott Sandals	**760-342-4363** 760-775-3688	50994 Monroe Street, Indio, CA 92201	18-hole, 7,093 yards
Bermuda Dunes Golf Course and Country Club	Darin Carlyle	760-902-3132	42-360 Adams Street, Bermuda Dunes, CA 92203	27-hole
Eagle Falls Golf Course	Willie Maples, or Sergio	760-423-9107, 760-238-5635	840245 Indio Springs Parkway, Indio, CA 92203	18-hole
Shadow Hills Golf Course (Sun City)		760-200-3375	80-875 Avenue 40, Indio, CA 92203-9439	18-hole
Empire Polo Club	David Nolasco, Robert E. del Mas	760-347-7448	81-800 Avenue 51, Indio, CA 92201	N/A
Eldorado Polo Club	Jan Hart	760-342-2223 x224, 760-702-6911	50950 Madison Street, Indio, CA 92201	N/A
Indio Parks including Posse Park	Paul Stalma	760-391-4140	N/A	N/A
Desert Shores RV Lot Resales HOA		760-775-9808	48170 Hjorth Street Indio, CA 92201	N/A
Outdoor Resort Indio HOA		760-775-7255	80-394 Avenue 48 Indio, CA 92201	18-hole
Unknown HOA				N/A

3.0 WATER DEMANDS FOR POTENTIAL RECYCLED WATER CUSTOMERS

Water supply and irrigation demand information was obtained from interviews and discussions with golf course and other staff where possible. Where water usage information could not be obtained directly, estimates were made based on the water usage of other similar water users.

Table 2 shows the estimated irrigation water demand and peak flow rate for each potential customer. Water sources currently used by these potential customers have been identified where known. Most golf courses have their own well(s) and some use water from the Coachella Canal to supplement well water use. The Coachella Canal is a branch of the All-American Canal conveying Colorado River Water.

Peak flows have been identified where known. Peak flows are important to size pipes and pumping facilities. Where the pumping capacity of the pump stations at the golf courses is known, this pumping capacity is used for the peak flow rate. Where the pumping capacity is not known, the peak flow is estimated by calculating the peak daily irrigation demand and assuming that this volume of water is applied during the 11 hour period per day that golf course irrigation systems typically operate.

Seasonal demand information was obtained for typical water use on golf courses in the arid southwestern United States where overseeding takes place in the fall. Figure 1 shows this estimated seasonal water usage pattern. The average annual water usage is multiplied by the demand factor associated with a particular month to predict the water usage for that month. Figure 1 also shows the normalized VSD recycled water supply for a 12-month period to show that water supply availability does not correspond to water demands. Seasonal aquifer storage would be required to effectively utilize all recycled water for irrigation. Table 3 shows the demand factors used for Figure 1.

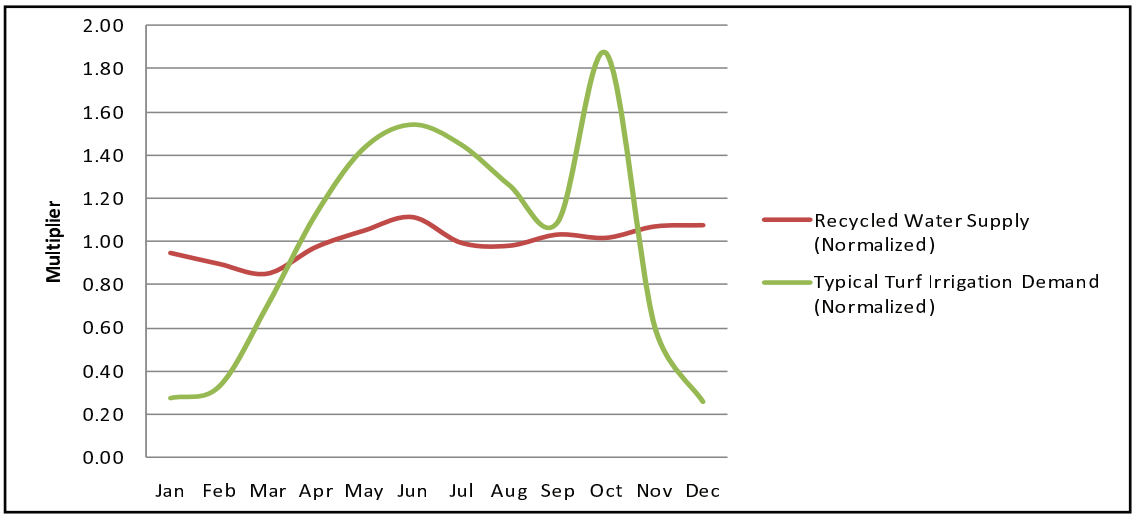


Figure 1 ***Monthly Irrigation Demand Pattern for Turf in the Arid Southwest with Fall Overseeding Compared to Valley Sanitary District Recycled Water Supply***

Table 2 Water Demands and Current Water Sources for Potential Recycled Water Customers

Name	Current Water Source			Area	Estimated Water Consumption			
	City Potable Water	Private Well	Coachella Canal	Acres	Annual Water Use, acre-ft.	Annual Water Demand	Maximum hours/day for Irrigation	Maximum Flow Rate
Heritage Palms Golf Club	minor	October	11 months	175	1,600	9.14 ft.	12	2,700 gpm
Indio Municipal Golf Course	No	Yes	No	38	358	11.20 ft.	8	700 gpm
Rancho Casa Blanco Country Club & HOA	No	Yes	No	13	117	9.00 ft.	8	200 gpm
Terra Lago Golf Club	No	No	Yes	192	1,728	9.00 ft.	12	2,700 gpm
Indian Palms Country Club	No	2 private wells	None	210	1,865	8.90 ft.	10	3,200 gpm
Indian Springs Country Club	No	Yes	Not Now, Yes in future	125	750	6.00 ft.	5	1,500 gpm
Plantation Golf Club	No	Yes	Yes, 90%	180	972	5.4 ft. from canal, 9.0 ft. total (approx.)	7	3,600 gpm
Bermuda Dunes Golf Course and Country Club	No	Yes	No	180	1,260	7 ft.	10	3,500 gpm
Eagle Falls Golf Course	No	Yes	Unknown	123	1,107	9 ft.	10	3,000 gpm
Shadow Hills Golf Course (Sun City)	No	Unknown	Yes	220	1,760	8.00 ft.	10	2,700 gpm
Empire Polo Club	No	Yes	Yes	421	2,950	7 ft.	10	4,200 gpm
Eldorado Polo Club	No	Yes	Yes			7 ft.	10	4,200 gpm
Indio Parks including Posse Park	Yes	No	No	83	500	6 ft.	10	1,000 gpm
Desert Shores Resales HOA	Unknown	Unknown	No	20	140	7 ft.	10	400 gpm
Outdoor Resort Indio HOA	Unknown	Unknown	No	24	168	7 ft.	10	475 gpm
Unknown HOA	Unknown	Unknown	No	16	112	7 ft.	10	320 gpm
Total					**15,387**			

Table 3 Monthly Water Supply and Irrigation Demand Peaking Factors used on Figure 1		
Month	Monthly Recycled Water Supply Peaking Factor	Irrigation Demand Seasonal Peaking Factor
Jan	0.95	0.28
Feb	0.90	0.33
Mar	0.85	0.71
Apr	0.97	1.13
May	1.05	1.43
Jun	1.11	1.54
Jul	0.99	1.45
Aug	0.98	1.26
Sep	1.03	1.09
Oct	1.02	1.87
Nov	1.07	0.61
Dec	1.08	0.26

Table 4 shows a comparison of the volume of recycled water that is available currently, and anticipated at buildout. VSD delivers 1 mgd to the wetlands treatment system located at the plant site. Required minimum discharge flows to the drainage channel have not been established, but are currently estimated to be 2 mgd. Therefore, the current average flow rate that may be available for irrigation is 3.3 mgd. Peak flow rates are expected to be as high as 4 mgd.

Table 4 Recycled Water Supply Compared with Potential Irrigation Demand				
Flow Condition	Current, mgd	Current, acre-ft/yr	Ultimate, mgd	Ultimate, acre-ft/yr
Average Annual Flow Rate from the VSD WWTP	6.3	6,984	16	17,924
Wetlands Treatment Project	1	---	1	---
Assumed Minimum VSD WWTP Discharge to the Channel	2	---	2	---
Available Average Recycled Water Irrigation Flow Rate	3.3	3,697	13	14,563
Estimated Peak Daily Recycled Water Irrigation Flow Rate (Average * 1.2)	4.0	---	15.6	---
Potential Average Annual Irrigation Water Demand	---	15,387	---	15,387
Note: Peak irrigation flow rates are a function of the specific customers that are scheduled to use water at any given time, and would need to be managed within the limits of both water supply and water delivery infrastructure.				

The total potential irrigation demand of 15,387 acre-ft/year is higher than the current recycled water availability. The total recycled water supply of 14,563 acre-feet that is available for irrigation at buildout is also less than the potential irrigation demand if the assumed 2 mgd is discharged to the channel. Therefore, the Coachella Canal and groundwater will still provide irrigation supply even when recycled water is available.

4.0 FIELD RECONNAISSANCE

4.1 Interview Notes

The following is a summary of the discussions with potential recycled water customers that responded to requests for information.

1. **Heritage Palms Golf Club** – This golf club is interested in using recycled water. The golf course has ponds that can be filled from a well or from the Coachella Canal. The ponds are designed such that most of the canal sediment is removed in a small pond before the water moves to a large storage pond adjacent to the golf course fairways. A water level monitoring system automatically controls the amount of canal water that enters the pond. Although these ponds can be used to store recycled water for irrigation, a preferred method of delivery would be to provide recycled water that is pressurized to approximately 95 psi so that re-pumping would not be necessary. The preferred location for a connection to the irrigation system would be where the sediment pond and pump station are co-located. Recycled water contains nitrogen and phosphorous that improves turf growth, but may create undesirable algae growth in storage ponds. Well water is used primarily for overseeding because the well water has lower salt levels so the new grass grows more readily. Although good turf can be grown in this area by applying 7 acre-ft/acre/year of water, 9 acre-ft/acre/year is applied at this golf course for salt leaching.
2. **Indio Municipal Golf Course (i.e., Posse Park located adjacent to the east of golf course)** – The irrigation system in this golf course is old, and the City plans to upgrade the irrigation system in 2010, so the City could install a purple pipe system for recycled water at that time. The current pumping rate of the existing pump station is less than desired, so a larger pump station would be preferred. In addition to the 32 irrigated acres, the city has approximately 10 acres of un-developed land around the golf course that could be used to place injection wells. Chlorine levels in the recycled water are a concern, particularly if superchlorination is a possibility, because the chlorine will kill or damage some plant life. Although recycled water could be introduced into the pond on this golf course, the pond already has problems with algae blooms and other undesirable plant growth and recycled water would exacerbate the problem. A pressurized system is preferred to eliminate re-pumping. The preferred location for recycled water to be delivered would be at the pond.
3. **Rancho Casa Blanca Country Club and HOA** – Phone calls were not returned, and staff were not available at the time of the visits.

4. **Terra Logo Golf Club** This golf course is not interested in using recycled water because of the cost of this water and because nitrate levels would cause algae blooms in ponds and lakes. Due to a lack of interest, golf course staff did not meet with our team.
5. **Indian Palms Country Club** – A site visit was made, but staff could not be reached at that time. A subsequent brief telephone conversation with the golf course superintendent revealed that the preferred method of delivery to the golf course would be into the two lakes on the golf course.
6. **Indian Springs Country Club** – This golf course currently uses well water exclusively. However, an agreement with the CVWD has been made that when the CVWD adds a pipeline to service a nearby school, the golf course would begin taking canal water. The water usage for this golf course is lower than for other golf courses because of careful monitoring and tight management, and because exclusive use of well water eliminates the need for leaching to reduce salinity levels. Although most of the golf course is inside the City of Indio boundaries, a portion of the golf course is outside the City. The preferred connection location would be into the two golf course lakes.
7. **Plantation Golf Club** – In 2009, this golf course plans to use 90 percent canal water, and in recent years the percentage of canal water usage has varied between 35 and 40 percent. Canal water deliveries are reported to be difficult to manage because the water ordered does not correspond well to the water delivered. There is no automatic monitoring system to deliver water like the Heritage Palms golf course. Canal water deliveries are based on a “take or pay” agreement, which sometimes leads to inefficiencies in golf course irrigation practices. Well water is used when canal water deliveries are not adequate, and for overseeding. Recycled water delivery to the golf course ponds is preferred. This golf course expects recycled water usage to be mandated in the future.
8. **Shadow Hills Golf Course (Sun City)** – This golf course already uses recycled water from the CVWD water reclamation plant located north of the golf course, so a visit was not made to this potential customer since calls were not returned.
9. **Bermuda Dunes Golf Course** – This golf course is not in Indio, but is located near two other Indio golf courses. The golf course has interest in discussions to investigate using recycled water. There are no ponds that could be used to store recycled water deliveries. Currently the golf course uses well water only.
10. **Eagle Falls Golf Course** – This golf course is owned and run by an Indian community. Calls for information were not returned, and staff were not available at the time of the visit.
11. **City of Indio Parks** – Information on water use at the parks was not available. Estimates have been made for the water use. Some of the parks are small, so recycled water irrigation may only be feasible at the larger parks located near the recycled water transmission system.

12. **Empire and El Dorado Polo Clubs** – Staff were not available at the time of a site visit, and phone calls have not been returned. At the time of the visit, one large field was being irrigated with several very large sprinklers. Another field was set up to be irrigated using solid set sprinkler pipes. The polo clubs would need a large flow for these sprinklers, and irrigation also appears to take place during the day, which is different from the golf course nighttime irrigation schedules.
13. **HOA Sites** – Several HOA sites appear to have significant irrigated areas, but these sites were not visited.

4.2 Items to Consider in a Recycled Water Program, Based on Customer Interviews

The following is a list of items that were discussed in the interviews with golf course superintendants. These items are issues that will probably need to be considered and addressed in some way or another when implementing the recycled water program.

1. The City of Indio golf course may be a viable first candidate for recycled water use. If injection wells are selected to be a part of the recycled water program, then the wells would be constructed just east of the golf course in Posse Park.
2. The City may choose to establish a policy of recycled water usage in portions of the City where the infrastructure that delivers the recycled water could be constructed at a lower cost. Recycled water supplies may not be adequate to serve all potential customers.
3. Some golf course customers would be satisfied with a low pressure system that delivers water to ponds or lakes, while other customers would prefer water delivered at 90 – 95 psi to avoid re-pumping. The City would need to decide which approach to use.
4. The recycled water delivery system could potentially be divided into two different zones to deliver water at different hydraulic gradelines. The line going north under Interstate 10 could operate at a different gradeline than a line going south and west to serve other customers at a lower elevation.
5. If recycled water needs to be delivered in purple pipes to satisfy legal requirements that recycled water systems be distinguished from potable systems, then the City may need to adopt a policy regarding distinguishing the use of recycled water in sprinkler systems in golf courses and parks that are already constructed (i.e., signage, etc.).
6. Golf courses typically irrigate between the hours of 7:00 pm and 6:00 am, so storage needs to be provided to balance the difference between recycled water availability and irrigation demands or supplement with other water.
7. Seasonal variations in demand and recycled water delivery would require some form of aquifer storage and recovery to maximize recycled water use.
8. Interest was expressed in receiving recycled water mixed with canal water, using the same conduits that canal water is currently received.
9. The City would need to establish and implement a set of irrigation times throughout a week for each customer.

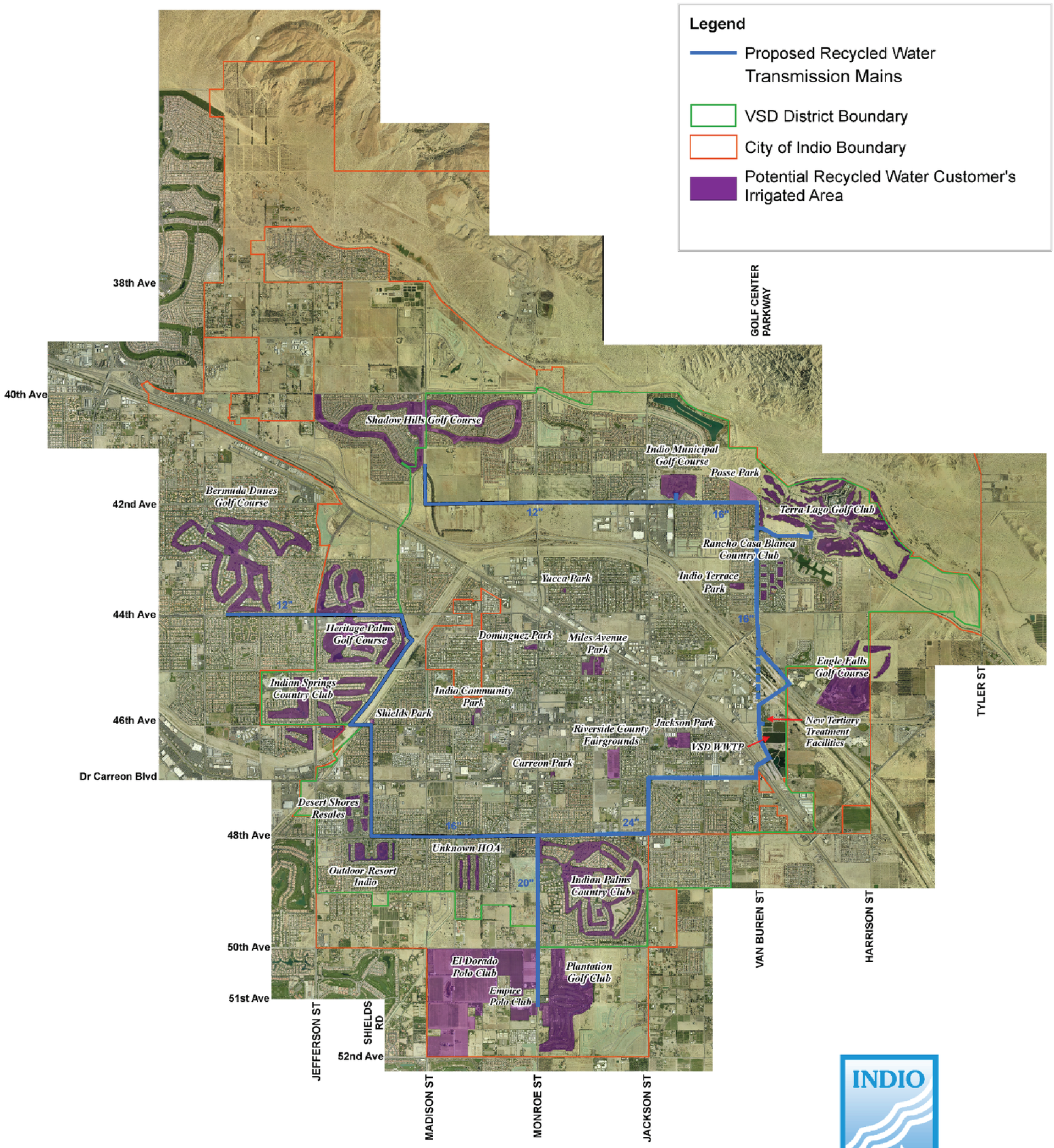
10. Recycled water nitrate and phosphorous levels can cause undesirable algae blooms in golf course ponds and lakes using current treatment at VSD. The City will probably need to address this issue to make recycled water more appealing to golf course owners.
11. Golf courses can obtain well water for a cost of $17 per acre-ft. plus the cost of pumping, and canal water can be obtained for a price of $30 per acre-ft. plus pumping costs. Golf courses are not likely to use recycled water exclusively. They will instead add recycled water to the mix of well and canal water that is already being used. The City will need to establish policies and strategies that encourage the desired amount of recycled water use, at an appropriate cost. If the primary objective of the recycled water system is to reduce groundwater pumping, then this objective is not achieved merely by replacing surface water with recycled water.
12. If the legal framework was in place to recharge recycled water then pump an equivalent amount of water from the golf course wells, then the infrastructure and management costs of the recycled water system would be significantly reduced.

5.0 CONCEPTUAL RECYCLED WATER DELIVERY SYSTEM

Figure 2 shows a map of the VSD and IWA boundaries, potential recycled water customer locations, and a conceptual pipeline route. To minimize infrastructure and pumping costs, the IWA may choose to deliver water at a pressure that is sufficient only to supply golf course ponds. The golf courses would then pump from the ponds to pressurize their irrigation systems. Recycled water pipelines would then be sized to deliver up to the maximum daily flow rate and not the peak flow rate from the irrigation pumps. Smaller recycled water users such as HOAs and City parks may need to provide booster pumping facilities to pressurize their irrigation systems to use recycled water. A phased program would add these smaller users as the recycled water transmission mains are extended to larger users.

The first portion of the recycled water delivery system would be to construct a pipeline from the VSD WWTP north across Interstate 10 to the Posse Park and Indio Municipal Golf Course. It may be easier to establish service to the City golf course and establish policies first based on experience with this customer. If the IWA chose to construct injection wells in Posse Park, then the pipeline infrastructure would be in place for these wells. Other customers that would utilize this pipeline could then be persuaded to connect to the recycled water system. A 16-inch line would provide up to 4.9 mgd and would be sufficient to supply all of the prospective customers north and east of Interstate 10. It is assumed that well injection in low irrigation demand periods.

The second portion of the water delivery system would be to run a line south and west of the VSD WWTP to serve the Indian Palms Country Club, Plantation Golf Club, and the Polo Clubs. This line may also be used to serve several of the City's parks. If the maximum daily flow rate will actually occur based on projected flows, then this pipe segment should be 24-inches in diameter. The polo clubs will require a higher flow rate than any of the golf courses, so a decision about requiring these clubs to use recycled water should be made before this pipeline is sized.



POTENTIAL RECYCLED WATER CUSTOMERS AND WATER DELIVERY INFRASTRUCTURE

Figure 2

December 2009

carollo

The third portion of the water delivery system would be a line from the intersection of Monroe Street and 48th Avenue to the Heritage Palms Golf Course and Indian Springs Country Club. This line could also serve HOAs and parks in the area. This pipeline would be 16-inches in diameter. If the Bermuda Dunes Golf Course (located outside the City limits) is served, then the pipeline would be 20-inches in diameter.

The Shadow Hills and Bermuda Dunes Golf Courses would be a lower priority for recycled water service. The Shadow Hills Golf Course is already using recycled water, and the Bermuda Dunes Golf Course is outside of the City boundaries. However, if the IWA had sufficient recycled water available that could not be used by other potential customers, then 12-inch pipelines could be constructed to deliver water to these customers as shown on Figure 2.

6.0 REFERENCES

Black & Veatch, 2008, *IWA Water Resources Development Plan Phase 2 Final Report*. Prepared for Indio Water Authority. August 2008.

Lee & Ro, Inc., 2006, *Valley Sanitary District Wastewater Treatment Plant Master Plan*. Prepared for Valley Sanitary District. October 2006.

APPENDIX 8.2

NOP COMMENT LETTERS

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

Notice of Preparation

July 6, 2010

To: Reviewing Agencies

Re: Indio Water Authority Recycled Water Program
SCH# 2010071019

Attached for your review and comment is the Notice of Preparation (NOP) for the Indio Water Authority Recycled Water Program draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Anders Wistrom
Indio Water Authority
83-101 Avenue 45
Indio, CA 92201

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Acting Director, State Clearinghouse

Attachments
cc: Lead Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2010071019
Project Title Indio Water Authority Recycled Water Program
Lead Agency Indio Water Authority

Type NOP Notice of Preparation

Description The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater. Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. Currently, VSD discharges ~7,000 acre-feet per year (AF/yr) of treated effluent to the unlined Coachella Valley Stormwater Channel which discharges into the Salton Sea ~13 miles downstream of the VSD outlet. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

Lead Agency Contact

Name Anders Wistrom
Agency Indio Water Authority
Phone 760-625-1808 **Fax**
email
Address 83-101 Avenue 45
City Indio **State** CA **Zip** 92201

Project Location

County Riverside
City Indio
Region
Cross Streets Dillon Rd on the east,Jefferson St on the west,52nd Ave on the south,37th Ave on the north
Lat / Long 33° 42.861" N / 116° 11.179" W
Parcel No.
Township 5,6S **Range** 6,7,8E **Section** Many **Base** SBB&M

Proximity to:

Highways I-10
Airports Bermuda Dunes
Railways UPRR
Waterways Day Creek
Schools Several
Land Use

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Growth Inducing; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Soil Erosion/Compaction/Grading; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife

Reviewing Agencies Resources Agency; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 6; CA Department of Public Health; Native American Heritage Commission; State Water Resources Control Board, Divison of Financial Assistance; Department of Toxic Substances Control; Caltrans, District 8; Regional Water Quality Control Board, Region 7

Note: Blanks in data fields result from insufficient information provided by lead agency.

Document Details Report
State Clearinghouse Data Base

Date Received 07/06/2010 ***Start of Review*** 07/06/2010 ***End of Review*** 08/04/2010

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP DISTRIBUTION LIST

County: [illegible]

SCH# 2010071019

Resources Agency

- [x] Resources Agency
  Nadell Gayou
- [ ] Dept. of Boating & Waterways
  Mike Sotelo
- [ ] California Coastal Commission
  Elizabeth A. Fuchs
- [ ] Colorado River Board
  Gerald R. Zimmerman
- [ ] Dept. of Conservation
  Rebecca Salazar
- [ ] California Energy Commission
  Eric Knight
- [ ] Cal Fire
  Allen Robertson
- [ ] Central Valley Flood Protection Board
  James Herota
- [ ] Office of Historic Preservation
  Wayne Donaldson
- [x] Dept of Parks & Recreation
  Environmental Stewardship Section
- [ ] California Department of Resources, Recycling & Recovery
  Sue O'Leary
- [ ] S.F. Bay Conservation & Dev't. Comm.
  Steve McAdam
- [x] Dept. of Water Resources
  Resources Agency
  Nadell Gayou
- [ ] _____
  Conservancy

Fish and Game

- [ ] Depart. of Fish & Game
  Scott Flint
  Environmental Services Division
- [ ] Fish & Game Region 1
  Donald Koch
- [ ] Fish & Game Region 1E
  Laurie Harnsberger
- [ ] Fish & Game Region 2
  Jeff Drongesen
- [ ] Fish & Game Region 3
  Charles Armor
- [ ] Fish & Game Region 4
  Julie Vance
- [ ] Fish & Game Region 5
  Don Chadwick
  Habitat Conservation Program
- [x] Fish & Game Region 6
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] Fish & Game Region 6 I/M
  Brad Henderson
  Inyo/Mono, Habitat Conservation Program
- [ ] Dept. of Fish & Game M
  George Isaac
  Marine Region

Other Departments

- [ ] Food & Agriculture
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] Depart. of General Services
  Public School Construction
- [ ] Dept. of General Services
  Anna Garbeff
  Environmental Services Section
- [x] Dept. of Public Health
  Bridgette Binning
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] Delta Protection Commission
  Linda Fiack
- [ ] Cal EMA (Emergency Management Agency)
  Dennis Castrillo
- [ ] Governor's Office of Planning & Research
  State Clearinghouse
- [x] Native American Heritage Comm.
  Debbie Treadway
- [ ] Public Utilities Commission
  Leo Wong
- [ ] Santa Monica Bay Restoration
  Guangyu Wang
- [ ] State Lands Commission
  Marina Brand
- [ ] Tahoe Regional Planning Agency (TRPA)
  Cherry Jacques

Business, Trans & Housing

- [ ] Caltrans - Division of Aeronautics
  Sandy Hesnard
- [ ] Caltrans - Planning
  Terri Pencovic
- [ ] California Highway Patrol
  Scott Loetscher
  Office of Special Projects
- [ ] Housing & Community Development
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] Caltrans, District 1
  Rex Jackman
- [ ] Caltrans, District 2
  Marcelino Gonzalez
- [ ] Caltrans, District 3
  Bruce de Terra
- [ ] Caltrans, District 4
  Lisa Carboni
- [ ] Caltrans, District 5
  David Murray
- [ ] Caltrans, District 6
  Michael Navarro
- [ ] Caltrans, District 7
  Elmer Alvarez
- [x] Caltrans, District 8
  Dan Kopulsky
- [ ] Caltrans, District 9
  Gayle Rosander
- [ ] Caltrans, District 10
  Tom Dumas
- [ ] Caltrans, District 11
  Jacob Armstrong
- [ ] Caltrans, District 12
  Chris Herre

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
- [ ] Transportation Projects
  Douglas Ito
- [ ] Industrial Projects
  Mike Tollstrup
- [x] State Water Resources Control Board
  Regional Programs Unit
  Division of Financial Assistance
- [ ] State Water Resources Control Board
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] State Water Resouces Control Board
  Steven Herrera
  Division of Water Rights
- [x] Dept. of Toxic Substances Control
  CEQA Tracking Center
- [ ] Department of Pesticide Regulation
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] RWQCB 1
  Cathleen Hudson
  North Coast Region (1)
- [ ] RWQCB 2
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] RWQCB 3
  Central Coast Region (3)
- [ ] RWQCB 4
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] RWQCB 5S
  Central Valley Region (5)
  - [ ] RWQCB 5F
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] RWQCB 5R
    Central Valley Region (5)
    Redding Branch Office
- [ ] RWQCB 6
  Lahontan Region (6)
  - [ ] RWQCB 6V
    Lahontan Region (6)
    Victorville Branch Office
- [x] RWQCB 7
  Colorado River Basin Region (7)
- [ ] RWQCB 8
  Santa Ana Region (8)
- [ ] RWQCB 9
  San Diego Region (9)

- [ ] Other _____

Last Updated on 03/24/10

California Regional Water Quality Control Board
Colorado River Basin Region

73-720 Fred Waring Drive, Suite 100, Palm Desert, California 92260
(760) 346-7491 • Fax (760) 341-6820
http://www.waterboards.ca.gov/coloradoriver

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

July 16, 2010

Mr. Anders Wistrom, PhD, PE
Principal Water Engineer
Indio Water Authority
86-101 Avenue 45
Indio, CA 92201

Dear Mr. Wistrom:

SUBJECT: NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT FOR AND INITIAL STUDY FOR THE INDIO RECYCLED WATER PROJECT

Regional Water Board staff has completed the review of the Notice of Preparation of an Environmental Impact Report (EIR) and an Initial Study for the Indio Recycled Water Project. Staff has the following comments:

1. The EIR should consider potential impacts of the project to the Beneficial Uses of the Coachella Valley Storm Water Channel (CVSC), and the Salton Sea.

2. The EIR should also consider impacts of the project to the wetlands in the CVSC, and address the USEPA's and the State of California's "No Net Loss of Wetlands" policies by providing alternatives and/or mitigation measures if necessary.

3. Section 1211 of the California Water Code states:

   "Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater, the owner of any wastewater treatment plant shall obtain approval of the board for that change."

   This approval can be obtained from the Division of Water Rights by filing a petition for change for owners of wastewater treatment plants.

Thank you for the opportunity to comment on the forthcoming EIR for this project. If you have questions regarding the above comments, you may contact me at 760) 776-8959, or jrokke@waterboards.ca.gov .

Jon Rokke
Water Resources Control Engineer

7-22-10

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

July 20, 2010

Mr. Anders Wistrom
INDIO WATER AUTHORITY
83-101 Avenue 45
Indio, CA 92201

Re: SCH#2010071019; CEQA Notice of Completion; draft Environmental Impact Report (DEIR) for the **"Indio Water Authority Recycled Water Program Project"**; located in the Coachella Valley; Riverrside County, California.

Dear Mr. Wistrom:

The Native American Heritage Commission (NAHC) is the state 'trustee agency' pursuant to Public Resources Code §21070 for the protection and preservation of California's Native American Cultural Resources.. (Also see *Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604)*. The California Environmental Quality Act (CEQA - CA Public Resources Code §21000-21177, amended in 2009) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following.

The Native American Heritage Commission did perform a Sacred Lands File (SLF) search in the NAHC SLF Inventory, established by the Legislature pursuant to Public Resources Code §5097.94(a) and Native American Cultural resources **were not identified** within the APE identified for the project. However, there are Native American Cultural resources in close proximity to the APE. Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource.. Also, the NAHC recommends that a Native American Monitor or Native American culturally knowledgeable person be employed whenever a professional archaeologist is employed during the 'Initial Study' and in other phases of the environmental planning processes.. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation (OHP) Coordinator's office (at (916) 653-7278, for referral to the nearest OHP Information Center of which there are 11.

Consultation with tribes and interested Native American tribes and interested Native American individuals, as consulting parties, on the NAHC list ,should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f)]*et se),* 36 CFR Part 800.3, the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. The 1992 *Secretary of the Interior's Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including *cultural landscapes.*

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

The authority for the SLF record search of the NAHC Sacred Lands Inventory, established by the California Legislature, is California Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10). The results of the SLF search are confidential. However, Native Americans on the attached contact list are not prohibited from and may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens. Although tribal consultation under the California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177) is 'advisory' rather than mandated, the NAHC does request 'lead agencies' to work with tribes and interested Native American individuals as 'consulting parties,' on the list provided by the NAHC in order that cultural resources will be protected. However, the 2006 SB 1059 the state enabling legislation to the Federal Energy Policy Act of 2005, does <u>mandate tribal consultation</u> for the 'electric transmission corridors. This is codified in the California Public Resources Code, Chapter 4.3, and §25330 to Division 15, requires consultation with California Native American tribes, and identifies both federally recognized and non-federally recognized on a list maintained by the NAHC

Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that construction or excavation be stopped in the event of an accidental discovery of

any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. . Note that §7052 of the Health & Safety Code states that disturbance of Native American cemeteries is a felony.

Again, Lead agencies should consider avoidance, as defined in §15370 of the California Code of Regulations (CEQA Guidelines), when significant cultural resources are discovered during the course of project planning and implementation

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Attachment: List of Native American Contacts

Cc: State Clearinghouse

Native American Contacts
July 20, 2010
Riverside County

Cabazon Band of Mission Indians
David Roosevelt, Chairperson
84-245 Indio Springs Cahuilla
Indio , CA 92203-3499
(760) 342-2593
(760) 347-7880 Fax

Augustine Band of Cahuilla Mission Indians
Mary Ann Green, Chairperson
P.O. Box 846 Cahuilla
Coachella , CA 92236
(760) 369-7171
760-369-7161

Los Coyotes Band of Mission Indians
Francine Kupsch, Spokesperson
P.O. Box 189 Cahuilla
Warner , CA 92086
loscoyotes@earthlink.net
(760) 782-0711
(760) 782-2701 - FAX

Morongo Band of Mission Indians
Michael Contreras, Cultural Heritage Prog.
12700 Pumarra Road Cahuilla
Banning , CA 92220 Serrano
mcontreras@monongo-nsn.
(951) 755-5025
(951)201-1866 - cell
(951) 922-0105 Fax

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

Torres-Martinez Desert Cahuilla Indians
Diana L. Chihuahua, Cultural Resources
P.O. Boxt 1160 Cahuilla
Thermal , CA 92274
dianac@torresmartinez.org
760) 397-0300, Ext. 1209
(760) 272-9039 - cell (Lisa)
(760) 397-8146 Fax

Santa Rosa Band of Mission Indians
John Marcus, Chairman
P.O. Box 609 Cahuilla
Hemet , CA 92546
srtribaloffice@aol.com
(951) 658-5311
(951) 658-6733 Fax

Agua Caliente Band of Cahuilla Indians THPO
Patricia Tuck, Tribal Historic Perservation Officer
5401 Dinah Shore Drive Cahuilla
Palm Springs, CA 92264
ptuck@aguacaliente-nsn.gov

(760) 699-6907
(760) 699-6924- Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and fed eral NAGPRA. And 36 CFR Part 800.3.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed BSCH#2010071019; CEQA Notice of Preparation (NOP) draft Environmental Impact Report (DEIR) for the Indio Water Authority Recycled Water Program; located in the Coachella Valley; Riverside County, California.

Native American Contacts
July 20, 2010
Riverside County

Augustine Band of Cahuilla Mission Indians
Karen Kupcha
P.O. Box 846 Cahuilla
Coachella , CA 92236
(760) 369-7171
916-369-7161

Cahuilla Band of Indians
Luther Salgado, Sr., , Chairperson
PO Box 391760 Cahuilla
Anza , CA 92539
tribalcouncil@cahuilla.net
915-763-5549

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and federal NAGPRA. And 36 CFR Part 800.3.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed BSCH#2010071019; CEQA Notice of Preparation (NOP) draft Environmental Impact Report (DEIR) for the Indio Water Authority Recycled Water Program; located in the Coachella Valley; Riverside County, California.

City of La Quinta

7-27-10

P.O. Box 1504
La Quinta, California 92247-1504
78-495 Calle Tampico
La Quinta, California 92253

(760) 777-7000
FAX (760) 777-7101

July 22, 2010

Mr. Anders Wistrom
Principal Water Engineer
Indio Water Authority
83-101 Avenue 45
Indio, CA 92201

SUBJECT: NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT - INDIO WATER AUTHORITY RECYCLED WATER PROJECT

Dear Mr. Wistrom:

Thank you for providing the City of La Quinta the opportunity to comment on the Notice of Preparation for Environmental Impact Report (EIR) – Indio Water Authority Recycled Water Project. We have no comments to provide at this time. We would greatly appreciate receiving a copy of the DEIR once it is available. Should you have any questions or comments, please do not hesitate to contact me at (760) 777-7071.

Sincerely,

LES JOHNSON
Planning Director

C: Bret Plumlee, Assistant City Manager, Management Services
Tim Jonasson, Public Works Director

State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

RECEIVED
AUG 03 2010
BY:

July 29, 2010

Mr. Anders Wistrom, Ph.D., P.E.
Principle Water Engineer
Indio Water Authority
83-101 Avenue 45
Indio, CA 92201

Dear Mr. Wistrom:

INDIO WATER AUTHORITY- SYSTEM NO. 3310020
NOTICE OF PREPARATION FOR ENVIRONMENTAL IMPACT REPORT

On July 21, 2010, the *Department of Public Health* (Department) received a *Notice of Preparation* (NOP) for the *Indio Water Authority* (IWA) recycled water program draft *Environmental Impact Report* (EIR). We understand that the IWA proposes to treat wastewater flows from the *Valley Sanitation District* (VSD) wastewater treatment plant for reuse at irrigation sites within or around the *City of Indio* (City) and may possibly use the treated wastewater for groundwater recharge and potable reuse. The NOP included information that the treated wastewater would comply with *California Code of Regulations, Title 22* (Title 22) Standards for recycled wastewater.

The IWA will be evaluating the recycling program in its EIR. For the Department's Title 22 regulations and for the protection of public health evaluations, the IWA proposed recycled water program could be broken into four subprojects; (1) treatment, (2) distribution, (3) use, and (4) reuse (municipal drinking water recovery) of wastewater. The Department has regulatory, engineering, design, operational, and administrative standards for each of the four subprojects. We understand that the proposed recycle water program will be developed by the IWA in phases, with wastewater treatment for irrigation and distribution as one of the first phases and the wastewater treatment for groundwater recharge and potable reuse to be developed in a later phase. The IWA will consider the groundwater recharge and potable reuse phase of its program while developing its recycled water program for irrigation distribution. We encourage the IWA to communicate regularly with the Department while planning and evaluating its recycled water program. The proposed EIR should clearly state that the IWA will develop and implement its recycled water program according to the Department's

regulatory, engineering, design, operational, and administrative requirements for the protection of public health.

The IWA will consider different wastewater treatment systems, such as tertiary filters, microfiltration, membrane bioreactors, and reverse osmosis treatment. The IWA will consider a chlorine disinfection system, and an ultraviolet (UV) advanced oxidation process (AOP) using hydrogen peroxide disinfection system. The Department has various regulations and requirements for the different wastewater treatment systems, the different disinfection systems, the distribution system, the use areas, and the groundwater recharge reuse of wastewater. Many of the public health protection regulatory requirements are in Title 22, while some of the public health protection requirements are in guidance documents, or professional organization documents.

The Department's requirements for groundwater recharge and reuse requirements can be complex and can take extensive planning and rigorous work to implement. The Department has draft regulations for groundwater recharge, *Groundwater Recharge Reuse, DRAFT Regulation, August 5, 2008* (draft recharge regulations). A copy of the draft recharge regulations is attached. The IWA should use the draft recharge regulations to identify the scope of work required to implement a groundwater recharge reuse recycling program.

The Department appreciates the NOP from the IWA and the consideration the IWA has for its proposed wastewater recycling program and the protection of public health. We look forward to working with the IWA to assist it in complying with the various regulatory, engineering, design, operational, and administrative requirements for the protection of public health. If you have any questions regarding this letter, please contact Paul J. Richter, Associate Sanitary Engineer, at (619) 525-4354.

Sincerely,

J. Steven Williams, P.E.
District Engineer

Enclosure: Groundwater Recharge Reuse, DRAFT Regulation, August 5, 2008

cc: County of Riverside, Department of Environmental Health (w/o attachment)

Lance Salisbury, Environmental Scientist (w/o attachment)
CDPH Environmental Review Unit
1616 Capitol Avenue, MS 7418
PO Box 997413
Sacramento, CA 95899-7413

Mr. Robert E. Perdue (w/o attachment)
Executive Officer
Water Quality Control Board Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

Randy Barnard, Senior Sanitary Engineer (w/o attachment)
Recycled Water Technical Specialist
Department of Public Health

File: Correspondence

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi
Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

July 29, 2010

RECEIVED
AUG 03 2010
BY:

Mr. Anders Wistrom, Ph.D., P.E.
Indio Water Authority
83-101 Avenue 45
Indio, California 92201

NOTICE OF PREPARATION (NOP) FOR A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE INDIO WATER AUTHORITY RECYCLED WATER PROGRAM PROJECT (SCH# 2010071019), RIVERSIDE COUNTY

Dear Mr. Wistrom:

The Department of Toxic Substances Control (DTSC) has received your submitted Notice of Preparation for a draft Environmental Impact Report (EIR) for the above-mentioned project. The following project description is stated in your document: "The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. The project components would be expected to be implemented in phases based upon recycled water availability and market demand. With implementation of the proposed tertiary treatment facilities to the VSD WWTP, the existing wetlands treatment facility could be eliminated. The proposed project components are generally located within the City of Indio or the VSD Service Area, with the exception of a pipeline and possible recharge area located east of these boundaries in the County of Riverside. The project site is approximately 20 acres in size and in bounded by Dillon Road on the east, Jefferson Street on the west, 52nd Avenue on the south, and 37th Avenue on the north. At the VSD WWTP site, the surrounding land uses are predominantly industrial, with the exception of the Coachella Valley Stormwater Channel".

Based on the review of the submitted document DTSC has the following comments:

1) The EIR should evaluate whether conditions within the Project area may pose a threat to human health or the environment. Following are the databases of some of the regulatory agencies:

- National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S.EPA).
- Envirostor (formerly CalSites): A Database primarily used by the California Department of Toxic Substances Control, accessible through DTSC's website (see below).
- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that is maintained by U.S.EPA.
- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.
- GeoTracker: A List that is maintained by Regional Water Quality Control Boards.
- Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.
- The United States Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017, (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).

2) The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site within the proposed Project area that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC would require an oversight agreement in order to review such documents.

3) Any environmental investigations, sampling and/or remediation for a site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in

which hazardous substances were found above regulatory standards should be clearly summarized in a table. All closure, certification or remediation approval reports by regulatory agencies should be included in the EIR.

4) If buildings, other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should also be conducted for the presence of other hazardous chemicals, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints (LPB) or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies.

5) Future project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soil to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contamination.

6) Human health and the environment of sensitive receptors should be protected during any construction or demolition activities. If necessary, a health risk assessment overseen and approved by the appropriate government agency should be conducted by a qualified health risk assessor to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.

7) If the site was used for agricultural, livestock or related activities, onsite soils and groundwater might contain pesticides, agricultural chemical, organic waste or other related residue. Proper investigation, and remedial actions, if necessary, should be conducted under the oversight of and approved by a government agency at the site prior to construction of the project.

8) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942. Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local

Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

9) DTSC can provide cleanup oversight through an Environmental Oversight Agreement (EOA) for government agencies that are not responsible parties, or a Voluntary Cleanup Agreement (VCA) for private parties. For additional information on the EOA or VCA, please see www.dtsc.ca.gov/SiteCleanup/Brownfields, or contact Ms. Maryam Tasnif-Abbasi, DTSC's Voluntary Cleanup Coordinator, at (714) 484-5489.

10) Also, in future CEQA documents, please provide your e-mail address, so DTSC can send you the comments both electronically and by mail.

If you have any questions regarding this letter, please contact me at rahmed@dtsc.ca.gov, or by phone at (714) 484-5491.

Sincerely,

Greg Holmes
Unit Chief
Brownfields and Environmental Restoration Program

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
P.O. Box 806
Sacramento, California 95812
ADelacr1@dtsc.ca.gov

CEQA # 2980

INDIO WATER AUTHORITY

AGENDA

August 3, 2010
at 4:00 p.m.
150 Civic Center Mall
Indio, California

Call to Order and ROLL CALL: President Gene Gilbert
Vice President Ben Godfrey
Commissioner Jerry Barba
Commissioner Melanie Fesmire
Commissioner Clifton Lamb
Commissioner Glenn Miller
Commissioner Richard Friestad
Commissioner H. Dow Tunis
Commissioner Lupe Ramos Watson

PLEDGE OF ALLEGIANCE

PUBLIC COMMENT *This is the time set aside for public comment on any matter not appearing on the agenda. If you wish to speak, please complete a "request to speak" form and limit your comments to three minutes (forms are located in the lobby of Council Chamber). Please watch the timing device on the podium.*

1. CONSENT CALENDAR:

a. Approve Minutes of June 29, 2010 *(Cynthia Hernandez, Secretary)* ***Recommendation:*** *Approve*

b. Approve Minutes of July 7, 2010 *(Cynthia Hernandez, Secretary)* ***Recommendation:*** *Approve*

c. Payment of Warrants *(Kelly Smith, Fiscal Officer)* ***Recommendation:*** *Approve*

d. Award contract to the lowest responsible bidder, Palm Springs Pump, in the amount of $297,401 for the booster pump and electrical upgrades at Dominguez Reservoir (Plant No. 2) and that a 10% contingency of $29,740 be established for unforeseen site conditions *(Paul Giera, Water Supervisor)* ***Recommendation:*** *Approve*

e. Approve Purchase and Sale Agreement between the City of Indio and the Indio Water Authority of the City of Indio for property known as APN 692-040-016 and 692-040-014 and authorize the Executive Director to execute all necessary documents *(Kelly Smith, Fiscal Officer)* ***Recommendation:*** *Approve*

PUBLIC HEARING:

2. Notice of Preparation of an Environmental Impact Report for the Indio Water Authority Recycled Water Project *(Anders Wistrom, Principal Water Engineer)* ***Recommendation:*** *Receive/File*

ADMINISTRATIVE ITEMS:

3. Progress Report on Water System Improvements *(Paul Giera, Water Supervisor)* ***Recommendation:*** *Receive/File*

4. Oral update on Integrated Regional Water Management Plan *(Paul Giera, Water Supervisor)* ***Recommendation:*** *Information only*

5. Executive Director Report

6. Commissioner comments and/or questions

ADJOURN

NEXT MEETING: September 7, 2010 at 4 p.m.

DECLARATION OF POSTING

I, Cynthia Hernandez, Secretary of the Indio Water Authority, do hereby declare that the foregoing agenda was posted on the outside entry to the Council Chamber, 150 Civic Center Mall on July 29, 2010.

Cynthia Hernandez, Secretary

PUBLIC NOTICE

The Indio City Council Chamber is handicapped accessible. Persons with disabilities can receive the agenda in an alternative format and should call the City Clerk's office at 760-391-4006. Notification 48 hours prior to a meeting will enable the City to make reasonable arrangements to ensure accessibility to that meeting (28 CFR 35.102.35 104 ADA Title 11).

INDIO WATER AUTHORITY
AGENDA REPORT

TO: HONORABLE PRESIDENT AND MEMBERS OF THE INDIO WATER AUTHORITY

FROM: TARA L. ADAMS, INTERIM EXECUTIVE DIRECTOR

DATE: JUNE 1, 2010

SUBJECT: ADOPT NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE INDIO WATER AUTHORITY RECYCLED WATER PROGRAM

SUMMARY

The Notice of Preparation of an Environmental Impact Report (EIR) for the Indio Water Authority Recycled Water Program defines the scope of potential environmental issues that will need to be evaluated in a program EIR. The Indio Water Authority, as lead agency, will coordinate the preparation of an EIR to evaluate the potential significant environmental impacts that may result from treating wastewater flows from Valley Sanitary District wastewater treatment plant for re-use on large scale irrigation sites and for possible groundwater recharge.

STAFF RECOMMENDATION

That the IWA:

1. Adopt a Notice of Preparation (NOP) for the proposed project EIR and fulfill legal notification requirements, and inform the public and CEQA Responsible and Trustee Agencies that an EIR will be prepared.

2. Conduct a public meeting during the 30-day NOP public review period where the public is invited to come and verbally express concerns and raise issues to be addressed in the EIR.

For IWA Agenda _____ **Item No. _____**

ENVIRONMENTAL ASSESSMENT

A general level Project Description and an Initial Study have been prepared, which define the scope of issues that will need to be evaluated in a program environmental impact report (EIR) to meet compliance requirements with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). This document, termed a Notice of Preparation (NOP), will be distributed to the public for a mandatory 30-day review and comment period.

ANALYSIS

The Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and possible groundwater recharge of the underlying aquifer. Currently, VSD discharges approximately 7,000 acre-feet per year (AF/yr); 8 million gallons per day of treated effluent to the unlined Coachella Valley Stormwater Channel, which discharges into the Salton Sea approximately 13 miles downstream of the VSD outlet. The NOP estimates the maximum flow necessary to maintain the established habitat at less than 1 million gallons per day. The proposed project would include: (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

FINANCIAL REVIEW

Not applicable.

PUBLIC NOTIFICATION PROCESS

This item has been noticed through the regular agenda notification process. Copies of this report are available at the City Hall public counter and the Indio Public Library.

ALTERNATIVES

1. Not adopt the Notice of Preparation for the proposed project EIR.
2. Request more information.

Submitted by:

Jim L. Smith, P.E.
Director of Public Works

Prepared by:

Anders Wistrom, Ph.D., P.E.
Principal Water Engineer

Financial Review:

Kelly Smith
Fiscal Officer

Concur:

Gary F. Lewis
General Services Manager

Attachment(s):

A. Initial Study
B. Project Description

AIR QUALITY IMPACT ANALYSIS

INDIO WATER AUTHORITY

TOWN OF INDIO, CALIFORNIA

Prepared for:
Tom Dodson & Associates
Attn: Pamela Wright
2150 N. Arrowhead Avenue
San Bernardino, California 92405

Date:

February 21, 2011

Project No.: P11-003 A

METEOROLOGY CLIMATE

The proposed Indio Water Authority (IWA) water recycling project site is located in the Coachella Valley Planning Area (CVPA) of the Salton Sea Air Basin (SSAB). The project site is in the hottest and driest parts of California. The climate is characterized by hot, dry summers and relatively mild winters. Rainfall is scant in all seasons, so differences between the seasons are characterized principally by differences in temperature. Average annual precipitation in the air basin ranges from 2 to 6 inches per year.

Seasonal temperature differences in the basin are large, confirming the absence of marine influences due to the blocking action of the mountains to the west. Average monthly maximum temperatures in the project vicinity range from 108ºF in July to 57ºF in January. The average monthly minima range from about 40ºF in January to about 80ºF in July.

During much of the year, California is covered by a moderately intense high-pressure system. In winter, the Pacific High retreats to the south, so that frontal systems from the North Pacific can move onto the California coast. On average, 20 to 30 frontal systems pass through California each winter. The first front usually arrives around the middle of October, and the average period of frontal activity is five to six months. Most of these systems are relatively weak by the time they reach the SSAB, however, and they become more diffuse as they move southeastward.

Spring is a transition season between the winter period of frontal activity and the generally dry summer; some precipitation continues during the early part of the season.

During the summer, the Pacific High is well developed to the west of California, and a thermal trough overlies the SSAB. The intensity and orientation of the trough varies from day to day. Although the rugged mountainous country prevents a normal circulation, the influence of this trough does permit some inter-basin exchange with coastal locations through the passes. Summer is also the season with occasional moisture influx from the Gulfs of Mexico or California which causes isolated thundershowers and flash flooding (the summer "monsoon").

Fall is the transition period from the hot summer back to the season of frontal activity, but it is still very dry and temperatures are still mild.

Desert regions tend to be windy, since little friction is generated between the moving air and the low, sparse vegetation cover. In addition, the rapid daytime heating of the lower air over the desert leads to strong convection activity. This exchange of lower and upper air accelerates surface winds during the warm part of the day when convection is at a maximum. During winter, however, the rapid cooling in the surface layers at night retards this exchange of momentum, and the result is often a high frequency of nearly calm winds, especially at night and early morning.

During all seasons, the prevailing wind direction is predominantly from the west to east. San Gorgonio Pass is an area where air is squeezed through a narrow opening with accelerated airflow that supports wind farms. The strong winds also occasionally lead to blowing sand that sandblasts painted surfaces and makes driving unsafe. As the west to east winds fan out into the

Coachella Valley, they slow down quickly. By the time the onshore flow reaches the Indio area, it has again returned to its normal speed.

The mixing depth, i.e., the height available for dispersion of airborne pollutants emitted near the surface, is limited by the occurrence of temperature inversions. A temperature inversion is a layer of air in which the temperature increases with height. The temperature inversion conditions of the SSAB are quite different from those of the coastal regions of California. In coastal environments, warm, subsiding air aloft creates a lid above the shallow marine layer at the surface. The base of this subsidence inversion is perhaps 1,500 feet above the surface in coastal portions of the Los Angeles Basin. When a subsidence inversion exists over the desert, the height of the inversion base lies some 6,000 to 8,000 feet above the surface.

Nighttime surface inversions in the desert are common, especially during the cooler months. Mixing heights are predominantly 1,000 feet or less. These inversions are caused by nighttime radiational cooling of the land surface in contact with overlying air that cools more slowly. They tend to be destroyed early in the day in summer, due to intense solar radiation and heating of the land surface. In winter, however, these radiation inversions tend to persist until mid-morning, limiting mixing in the lower atmosphere to heights of 200 to 2,000 feet above the surface. Nuisance air quality problems in the Coachella Valley, such as dust near mining operations or odors near feedlots or wastewater plants, occur mainly late at night or early in the morning when such radiation inversions are strongest.

AIR QUALITY SETTING

Ambient Air Quality Standards (AAQS)

In order to gauge the significance of the air quality impacts of the proposed Indio Water Authority (IWA) water recycling project, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. In 2003, the Environmental Protection Agency (EPA) adopted a rule which extended and established a new attainment deadline for ozone for the year 2021 for most heavily polluted areas of the region. Because the State of California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 1. Sources and health effects of various pollutants are shown in Table 2.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. EPA subsequently developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5"). New national AAQS were adopted in 1997 for these pollutants.

Planning and enforcement of the federal standards for PM-2.5 and for ozone (8-hour) were challenged by trucking and manufacturing organizations. In a unanimous decision, the U.S. Supreme Court ruled that EPA did not require specific congressional authorization to adopt national clean air standards. The Court also ruled that health-based standards did not require preparation of a cost-benefit analysis. The Court did find, however, that there was some inconsistency between existing and "new" standards in their required attainment schedules. Such attainment-planning schedule inconsistencies centered mainly on the 8-hour ozone standard. EPA subsequently agreed to downgrade the attainment designation for a large number of communities to “non-attainment” for the 8-hour ozone standard.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (ARB) to recommend adoption of the statewide PM-2.5 standard that is more stringent than the federal standard. This standard was adopted in 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a federal clean air standard, but only requires continued progress towards attainment.

Similarly, the ARB extensively evaluated health effects of ozone exposure. A new state standard for an 8-hour ozone exposure was adopted in 2005, which aligned with the federal 8-hour standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.075 ppm. The state standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress towards attaining state standards, but there are no hard deadlines or any consequences of non-attainment. During the same re-evaluation process, the ARB adopted an annual state standard for nitrogen dioxide (NO_2) that is more stringent than the corresponding federal standard, and strengthened the state one-hour NO_2 standard.

As part of EPA's 2002 consent decree on clean air standards, a further review of airborne particulate matter (PM) and human health was initiated. A substantial modification of federal clean air standards for PM was promulgated in 2006. Standards for PM-2.5 were strengthened, a new class of PM in the 2.5 to 10 micron size was created, some PM-10 standards were revoked, and a distinction between rural and urban air quality was adopted.

In response to continuing evidence that ozone exposure at levels just meeting federal clean air standards is demonstrably unhealthful, EPA has proposed a further strengthening of the 8-hour standard. Draft standards have been published. The likely future 8-hour standard will be 0.065 ppm. Environmental organizations generally praise this proposal. Most manufacturing, transportation or power generation groups oppose the new standard as economically unwise in an uncertain fiscal climate.

Of the standards shown in Table 1, those for ozone (O_3), and particulate matter (PM-10) are exceeded at times in the Salton Sea. They are called "non-attainment pollutants." Because of the variations in both the regional meteorology and in area-wide differences in levels of air pollution emissions, patterns of non-attainment have strong spatial and temporal differences.

A new federal one-hour standard for nitrogen dioxide (NO_2) has also recently been adopted. This standard is more stringent than the existing state standard. Based upon air quality monitoring data in the South Coast Air Basin, the basin will likely be designated as "non-attainment" for the national one-hour standard. That designation will require the inclusion of NO_2 in the basin air quality management plan.

Table 1

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	53 ppb (100 µg/m^3) (see footnote 8)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3) (see footnote 8)	None	
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 µg/m^3)	Ultraviolet Fluorescence	—	—	Ultraviolet Flourescence: Spectrophotometry (Pararosaniline Method)[9]
	3 Hour	—		—	0.5 ppm (1300 µg/m^3) (see footnote 9)	
	1 Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3) (see footnote 9)	—	
Lead[10]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[11]	—		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

For more information please call ARB-PIO at (916) 322-2990 California Air Resources Board (09/08/10)

IWA

Table 1 (continued)

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

9. On June 2, 2010, the U.S. EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The EPA also revoked both the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm, effective August 23, 2010.
   The secondary SO_2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

10. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

11. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Table 2
Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Fine Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Baseline Air Quality

In the Coachella Valley portion of the SSAB, air quality planning, enforcement and monitoring responsibilities are carried out by the South Coast Air Quality Management District (SCAQMD). Existing and probable future levels of air quality around the project area can be best inferred from ambient air quality measurements conducted by the SCAQMD at the Indio and Palm Springs air quality monitoring stations. In Indio, ozone and 10-micron or less in diameter, (respirable) particulates called PM-10, are monitored. These two pollutants are the main air pollution problems in the Coachella Valley portion of the SSAB. Vehicular pollution levels such as carbon monoxide (CO) and nitrogen dioxide (NO_2) are monitored at Palm Springs. Levels of CO and NO_2 at the project site are likely lower than those monitored in Palm Springs. However, because CO and NO_2 levels in Palm Springs are well within acceptable limits, their use to characterize the project site introduces no complications. The last six years of published data from Indio and Palm Springs stations are summarized in Table 3. The following conclusions can be drawn from this data:

1. Photochemical smog (ozone) levels often exceed standards. The 1-hour state standard was violated an average of 15 times a year in the last six years near Indio. The 8-hour state ozone standard has been exceeded an average of 53 times a year in the past six years. The Federal eight-hour ozone standard has averaged around 53 violations per year. While ozone levels are still high, they are much lower than 10 to 20 years ago. Attainment of all clean air standards in the project vicinity is not likely to occur soon, but the severity and frequency of violations is expected to continue to slowly decline during the current decade.

2. Carbon monoxide (CO) measurements near the project site have declined throughout the last decade, and 1 and 8-hour CO levels were at their lowest in history in 2008. Federal and state CO standards have not been exceeded in the last 10+ years. Despite continued basin-wide growth, maximum one- or 8-hour CO levels at the closest air monitoring station are less than 25 percent of their most stringent standards because of continued vehicular improvements. These data suggests that baseline CO levels in the project area are generally healthful and can accommodate a reasonable level of additional traffic emissions before any adverse air quality effects would be expected.

3. PM-10 levels as measured at Indio, periodically exceed the state 24-hour standard, but the national 24-hour particulate standard has only been exceeded 6 time in the last six years. Particulate levels have traditionally been high in Riverside County because of agricultural activities, dry soil conditions and upwind industrial development. State PM-10 standards are exceeded an average of 37 percent of all days per year.

4. A fraction of PM-10 is comprised of ultra-small diameter particulates capable of being inhaled into deep lung tissue (PM-2.5). Year 2008 showed the lowest maximum 24-hour concentration in recent years. Even with the recent revision of the national 24-hour PM-2.5 standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$, there have been only two violations of the 24-hour federal PM-2.5 standard in recent years.

Table 3
Air Quality Monitoring Summary
(Days Standards Were Exceeded and Maximum Observed Concentrations)

Pollutant/Standard	2003	2004	2005	2006	2007	2008
Ozone[a]						
1-Hour > 0.09 ppm (S)	24	23	18	5	8	12
8-Hour > 0.07 ppm (S)	60	68	58	42	48	44
8- Hour > 0.075 ppm (F)	40	50	34	28	30	27
Max. 1-Hour Conc. (ppm)	0.12	0.11	0.11	0.10	0.11	0.12
Carbon Monoxide[b]						
1-hour > 20. ppm (S)	0	0	0	0	0	0
8- Hour > 9. ppm (S,F)	0	0	0	0	0	0
Max 1-hour Conc. (ppm)	3.3	2.1	2.1	2.3	1.5	1.3
Max 8-hour Conc. (ppm)	2.2	2.0	2.0	1.9	1.9	1.8
Nitrogen Dioxide[b]						
1-hour > 0.18 ppm (S)	0	0	0	0	0	0
Max 1-hour Conc. (ppm)	0.07	0.07	0.06	0.09	0.06	0.05
Respirable Particulates (PM-10)[a]						
24-hour > 50 $\mu g/m^3$ (S)	51/117	24/119	38/113	25/61	53/86	23/112
24-hour > 150 $\mu g/m^3$ (F)	3/117	1/119	0/113	0/61	2/86	0/112
Max. 24-Hr. Conc. ($\mu g/m^3$)	158	74	122	Na	212	76
Ultra-Fine Particulates (PM-2.5)[a]						
24-Hour > 35 $\mu g/m^3$ (F)	0/118	0/110	2/106	0/107	0/97	0/113
Max. 24-Hr. Conc. ($\mu g/m^3$)	27.	29.	44.	26.	27.	22.

[a]Data from Indio monitoring station #4157
[b]Data from Palm Springs air monitoring station #4137

Source: SCAQMD Air Monitoring Summaries.

(S) = state standard, (F) = federal standard

5. More localized pollutants such as nitrogen oxides, lead, etc. are very low near the project site because background levels even in Palm Springs never exceed allowable levels, and there are only limited sources of such emissions near the project site. There is substantial excess dispersive capacity to accommodate localized vehicular air pollutants such as NOx without any threat of violating the applicable standards.

AIR QUALITY PLANNING

Air quality in the SSAB is largely dependent upon what is arriving from the upwind South Coast Air Basin (SCAB). In the SCAB, the agencies designated by the governor to develop regional air quality plans are the SCAQMD and the Southern California Association of Governments (SCAG). The two agencies adopted an Air Quality Management Plan (AQMP) in 1979 and revised it in several increments as attainment schedule estimates were demonstrated to be overly optimistic.

In 1988, the California Legislature enacted the California Clean Air Act (CCAA). The CCAA requires that regional emissions be reduced by 5 percent per year, averaged over 3-year periods, until attainment can be demonstrated. Each area that did not meet a national or state ambient air quality standard was required to prepare a plan which demonstrated how the 5 percent reductions was to be achieved.

The 1990 Federal Clean Air Act Amendment (CAAA) required that all states with air-sheds with "serious" or worse ozone problems submit a revision to the State Implementation Plan (SIP). Amendments to the SIP have been proposed, revised and approved over the past decade. The violations of the air quality standards for ozone in the SSAB are heavily related to pollution control programs in the upwind SCAB. Violations for particulate (PM-10 and PM-2.5) standards are due to a combination of both local and regional effects. The local contribution to high particulate levels (especially PM-10) has been the target of a number of plans to achieve clean air standards.

The SCAQMD adopted the first attainment plan for PM-10 in the Coachella Valley in 1990. That plan focused on fugitive dust as the primary control strategy. The plan to meet the federal 24-hour PM-10 standard was subsequently revised several times. The last revision was in 2002 which requested an extension until 2006 to bring the Coachella Valley into compliance.

The federal 24-hour PM-10 standard has not been exceeded in the last decade. On January 8, 2010, the SCAQMD adopted a re-designation request to remove the "serious non attainment" designation. The applicable PM-10 plan is now the Coachella Valley PM-10 Maintenance Plan. The plan includes an emissions inventory, a demonstration that the PM-10 standard will continue to be met for ten years, and contingency provisions to address any possible future violations. The enhanced fugitive dust control measure applicable to all construction projects in the Coachella Valley is an integral component of the maintenance plan. Any project construction activities will require use of best available control measures (best management practices) to assure consistency with the PM-10 maintenance plan.

AIR QUALITY IMPACT ANALYSIS

Standards of Significance

Although the SSAB is its own air basin, the SCAQMD performs air quality monitoring, enforcement and planning functions for the Coachella Valley under contract to Riverside County. SCAQMD CEQA guidelines are therefore often applied to Coachella Valley projects.

Many air quality impacts from dispersed mobile sources, i.e., the dominant pollution generators from the proposed project, often occur hours later and miles away after photochemical processes have converted primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual source is generally immeasurably small. The SCAQMD has therefore developed suggested surrogate significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. The SCAQMD CEQA Air Quality Handbook (1993) states that any projects in the SSAB with daily construction and operational emissions that exceed any of the following thresholds should be considered as having an individually and cumulatively significant air quality impact:

SCAQMD Emissions Significance Thresholds(pounds/day)

Pollutant	Emissions (Construction)
ROG	75
NOx	100
CO	550
PM-10	150
PM-2.5	55
SOx	150
Lead	3

Source: SCAQMD CEQA Air Quality Handbook, November, 1993 Rev.

The U.S. Clean Air Act Amendments of 1990, at Section 176c, prohibits any federal participation in any program that is not in conformity with the applicable state implementation plan (SIP). For Southern California, this is the 2007 AQMP. Participation includes federal project funding. If the proposed project seeks partial federal funding approval, a Clean Air Act conformity finding is required.

Conformity analysis under EPA guidelines can be undertaken to demonstrate that the combined emissions from direct and indirect (transportation, etc.) project-related emissions have been accurately incorporated into the applicable SIP. A simpler test, as outlined in 40CFR Part

93.153, is to demonstrate that these emissions are less than the *de minimis* thresholds which depend upon the seriousness of the current level of non-attainment for federal clean air standards. Although the project area is in the SSAB, Coachella Valley air quality is dependent upon conditions in the upwind SCAB. The SCAB is designated as "extreme" non-attainment for the 8-hour ozone standard. The annual emissions significance threshold for projects in extreme ozone non-attainment areas are as follows:

Reactive Organic Gases – 10 tons/year

Nitrogen Oxides – 10 tons/year

Particulate Matter – 70 tons/year

Projects with annual direct and indirect emissions below these thresholds are considered to be in conformance with the applicable SIP.

AIR QUALITY IMPACT

The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. Currently, VSD discharges approximately 7,000 acre-feet per year (AF/yr) of treated effluent. This project increases the discharge to almost 18,000 AF/yr though the following improvements:

(1) Installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water

(2) Installation and/or conversion and operation of approximately 22 linear-miles pipelines for recycled water conveyance,

(3) Installation and operation of one or more groundwater recharge treatment facilities, and

(4) Installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

(5) Install booster pumping facilities to pressurize their irrigation systems in order to use recycled water for HOAs, golf courses and City parks

Potential air quality impacts to the immediate project vicinity would derive predominantly during construction of the proposed improvements.

The proposed upgrades and expansion will require additional electrically powered equipment to convey and treat water. It is forecast that implementation of this project will increase daily operational electrical consumption by 1.1 MW per day for the regenerable and non-regenerable treatment units and 4.3 MW for booster stations. The expanded electrical load may cause limited amounts of carbon dioxide (CO_2) and other greenhouse gases (GHG) to be released.

Construction Activity Impacts

Construction activities for the proposed upgrade and expansion project are anticipated to occur over an approximately 1-year period with the exception of pipeline installation which will occur over nine years. Since SIP compliance is based on a single years construction emissions this represents a worst-case construction scenario. If activity schedule is spread out to multiple years, annual emissions will be less. Activities occur during site development and then during equipment installation. Additional time may be required to bring equipment on line and for equipment testing which will not entail any measurable air pollution emissions. On-site construction equipment emissions were calculated utilizing the URBEMIS2007 computer model. Employee commuting emissions as well as material delivery trucks emissions are calculated for each construction utilizing EMFAC2007.

The following phasing assumptions were utilized for heavy equipment operations:

ASR Wells –45 days each
4 wells, 1000 miles delivery truck per well
2 workers

Pipelines 9 years, 40 days/year
40 miles RT delivery,
Backhoe, crane, compactor, roller, pavement cutter, grinder, haul trucks, 2 dump trucks, water truck, excavator
Undeveloped areas: 900 ft excavated, installed, backfilled and compacted daily (3 miles)
Developed areas: 300 feet per day (19 miles)
10 hour workdays/6 days week

Reservoirs
<u>Grading 10-15 dayss</u>
1 dozer, 1 loader, 1 water truck, 1 grader, 1 excavator, 2 dump trucks working all day
8 workers, 40 miles RT
<u>Construction 30 days</u>
6 deliveries day, 20 miles RT for 30 days
Crane, forklift, backhoe, loader, 2 haul trucks
6 workers, 40 miles RT

Booster Stations
0.5 acres/day
<u>Grading</u> 5 days
Dozer, water truck, dump truck
5 workers, 40 miles RT
<u>Construction 3 months</u>
6 delivery trucks/day @ 20 miles RT
Crane, forklift, backhoe, loader all 4 hours day
5 workers, 40 miles RT

Regenerable and Non-regenerable Treatment
Grading 0.5 acres/day, 5 days per treatment
Dozer, water truck, dump truck (4 hours/day)
5 workers, 40 miles RT
Construction 30 days
6 truck trips/day, 20 miles RT
Crane, forklift, backhoe, loader all @ 4 hours/day
5 workers, 40 miles RT

Emissions for the indicated construction equipment fleet were as follows (URBEMIS2007):

Peak Construction Activity Emissions (pounds/day)

Activity	ROG	NOx	CO	SO_2	PM-10	PM-2.5	CO_2
ASR Wells							
No Mitigation	1.7	15.8	6.9	0.0	3.2	1.1	1,982.1
With Mitigation	1.7	13.4	6.9	0.0	0.8	0.2	1,982.1
Pipelines							
No Mitigation	4.1	34.6	16.4	0.0	6.6	2.5	4,092.4
With Mitigation	4.1	29.5	16.4	0.0	1.6	0.5	4,092.4
Reservoirs							
No Mitigation	4.6	39.3	19.5	0.0	4.3	2.1	4,344.9
With Mitigation	4.6	33.4	19.5	0.0	0.9	0.4	4,344.9
Booster Stations*							
No Mitigation	2.3	20.9	8.9	0.0	3.3	1.2	2,233.8
With Mitigation	2.3	17.8	8.9	0.0	0.8	0.3	2,233.8
Regen/Non Regen Treatment							
No Mitigation	1.7	15.5	7.5	0.0	1.8	0.8	1,630.6
With Mitigation	1.7	13.2	7.5	0.0	0.4	0.2	1,630.6
SCAQMD Threshold	75	100	550	150	150	55	n/a

*assume groundwater replenishment facilities will have the same level of construction activities as booster stations.

In addition to the above construction equipment, a construction crew of is assumed to be employed with round trip commute distance of 40 miles per employee. Truck delivery

assumptions regarding number of deliveries and trip length were provided earlier. Utilizing EMFAC2007 roadway emissions factors, the following emissions were calculated for the year 2012 (pounds/day) for on-road travel:

On-Road Emissions from Crew Commuting and Equipment Deliveries(pounds/day)

Activity	Miles/day	ROG	NOx	CO	PM-10	PM-2.5	CO_2
ARS Wells 45 days each							
2 workers	80	0.1	0.1	0.6	0.0	0.0	88.1
Delivery -1,050 miles total	23	0.1	0.7	0.2	0.0	0.0	97.0
Pipelines-40 days/year							
12 workers	480	0.4	0.4	3.7	0.0	0.0	528.7
Delivery -1 truck/day max	40	0.1	1.2	0.4	0.1	0.1	168.6
Reservoirs Grading 10 days							
8 workers	320	0.3	0.2	2.4	0.0	0.0	352.5
Reservoirs Construction 30 days							
6 workers	240	0.2	0.2	1.8	0.0	0.0	264.4
Delivery-6 trips per day	120	0.3	2.9	1.5	0.0	0.0	419.0
Booster Stations Grading-5days							
5 workers	200	0.2	0.2	1.5	0.0	0.0	220.3
Booster Stations Construction							
5 workers	200	0.2	0.2	1.5	0.0	0.0	220.3
Delivery-6 trips per day	120	0.3	2.9	1.5	0.0	0.0	419.0
Regen Grading							
5 workers	200	0.2	0.2	1.5	0.0	0.0	220.3
Regen Construction							
5 workers	200	0.2	0.2	1.5	0.0	0.0	220.3
Delivery-6 trips per day	120	0.3	2.9	1.5	0.0	0.0	419.0

The combined total emissions were calculated by adding unmitigated construction equipment emissions (URBEMIS2007) with the commuting and delivery (EMFAC2007) emissions.

Construction, Truck Haul and Employee Commuting (pounds/day)

ARS Wells 45 days each	**ROG**	**NOx**	**CO**	**PM-10**	**PM-2.5**	**CO_2**
Construction Equipment	1.7	15.8	6.9	3.2	1.1	1,982.1
Commuting	0.1	0.1	0.6	0.0	0.0	88.1
Material Delivery	0.1	0.7	0.2	0.0	0.0	97.0
Total	1.9	16.6	7.7	3.2	1.1	2,167.2

Pipelines 40 days/year for 9 years	**ROG**	**NOx**	**CO**	**PM-10**	**PM-2.5**	**CO_2**
Construction Equipment	4.1	34.6	16.4	6.6	2.5	4,092.4
Commuting	0.4	0.4	3.7	0.0	0.0	528.7
Material Delivery	0.1	1.2	0.4	0.1	0.1	168.6
Total	4.6	36.2	20.5	6.7	2.6	4,789.7

Reservoirs	**ROG**	**NOx**	**CO**	**PM-10**	**PM-2.5**	**CO_2**
Grading-15 days						
Construction Equipment	4.6	39.3	19.5	4.3	2.1	4,344.9
Commuting	0.2	0.2	0.2	2.4	0.0	352.5
Total	4.8	41.2	19.7	6.7	2.1	4,697.4
Construction-30 days						
Construction Equipment	1.5	12.3	9.0	0.7	0.6	1,776.9
Commuting	0.2	0.2	1.8	0.0	0.0	264.4
Material Delivery	0.3	2.9	1.5	0.0	0.0	419.0
Total	2.0	15.4	12.3	0.7	0.6	2,460.3

Booster Stations	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Grading-5 days						
Construction Equipment	2.3	20.9	8.9	3.3	1.2	2,233.8
Commuting	0.2	0.2	1.5	0.0	0.0	220.3
Total	2.5	21.1	10.4	3.3	1.2	2,454.1
Construction-3 months						
Construction Equipment	1.1	9.3	6.9	0.5	0.5	1,444.4
Commuting	0.2	0.2	1.5	0.0	0.0	220.3
Material Delivery	0.3	2.9	1.5	0.0	0.0	419.0
Total	1.6	12.4	9.9	0.5	0.5	2,083.7

Regen	ROG	NOx	CO	PM-10	PM-2.5	CO_2
Grading-5 days						
Construction Equipment	1.7	15.5	7.5	1.8	0.8	1,630.6
Commuting	0.2	0.2	1.5	0.0	0.0	220.3
Total	1.9	15.7	9.0	1.8	0.8	1,850.9
Construction-30 days						
Construction Equipment	1.1	8.5	6.7	0.5	0.5	1,368.5
Commuting	0.2	0.2	1.5	0.0	0.0	220.3
Material Delivery	0.3	2.9	1.5	0.0	0.0	419.0
Total	1.6	11.6	9.7	0.5	0.5	2,007.8

The regional air quality impacts associated with construction equipment activity during project activities are shown to be less-than-significant for every air pollutant while activities occur in discrete phases. However, a worst case scenario was assumed to be where each activity occurs

simultaneously in s single year. The following represents the worst case day where all project elements are under construction at the same time:

Maxima Daily Construction Emissions (lbs/day)

	ROG	NOx	CO	PM-10	PM-2.5	CO_2
ARS Wells	1.9	16.6	7.7	3.2	1.1	2,167.2
Pipelines	4.6	36.2	20.5	6.7	2.6	4,789.7
Reservoir	2.0	15.4	12.3	0.7	0.6	2,460.3
Booster Station	1.6	12.4	9.9	0.5	0.5	2,083.7
Regen	1.6	11.6	9.7	0.5	0.5	2,007.8
Total	11.7	92.2	50.4	11.6	5.3	13,508.70
SCAQMD Thresholds	75	100	550	150	55	-

Even utilizing unmitigated, peak daily emissions for each construction phase will be below the applicable SCAQMD CEQA threshold. Application of recommended mitigation provided in the appendix will reduce emissions even further. The mobile nature of the on-site construction equipment over the IWA site, as well as construction of the pipeline extending throughout the region will likely prevent any localized violation of the NOx or other standards.

Annualized construction activity emissions were calculated by assuming peak daily activities would occur for the indicated time frame. The calculated emissions were then compared to the EPA *de minimis* emission thresholds that would allow for a federal conformity finding with Section 176c of the Clean Air Act. The assumed annual distribution of activity and associated unmitigated annual emissions for project construction are as follows:

Annual Air Pollution Emissions (tons/year)

Activity	*Days*	*ROG*	*NOx*	*CO*	*PM-10*	*PM-2.5*	*CO_2*
ARS Wells (4 per year)	45	0.17	1.49	0.69	0.29	0.10	195.05
Pipeline	40	0.09	0.72	0.41	0.13	0.05	95.79
Reservoir Grading	10	0.04	0.31	0.15	0.05	0.02	35.23
Reservoir Construction	30	0.03	0.23	0.18	0.01	0.01	36.90
Booster Grading	5	0.01	0.05	0.03	0.01	0.00	6.14
Booster Construction	90	0.07	0.56	0.45	0.02	0.02	93.77
Regen Grading	5	0.00	0.04	0.02	0.00	0.00	4.63
Regen Construction	30	0.02	0.17	0.15	0.01	0.01	30.12
Total	**-**	0.44	3.58	2.07	0.53	0.21	497.62
De Minimis	-	10	10	n/a	70	100	-

Emissions from project construction activities will be well below the EPA *de minimis* thresholds demonstrating conformance with the SIP.

Operational air pollution emissions will be minimal except for those associated with electrical generation of power used to operate the treatment and conveyance system. Minor amounts of exhaust pollution will result from delivery of treatment chemicals, filtration media and disposal of wastes. Electrical consumption has no single uniquely related air pollution emissions source because power is supplied to and drawn from a regional grid. Electrical power is generated regionally by a combination of non-combustion (nuclear, hydroelectric, solar, wind, geothermal, etc.) and fossil fuel combustion sources. There is no direct nexus between consumption and the type of power source or the air basin where the source is located. Operational air pollution emissions from electrical generation are therefore not attributable on a project-specific basis.

Operational mobile source emissions were calculated based upon an assumed five new empolyee trip generation of five trips per day, five days per week, at 20 miles per round trip. Mobile source emissions from an estimated annual vehicle mile traveled (VMT) generation of 26,000 miles were calculated for the year 2012 as following using the EMFAC2007 emissions model (tons/year):

ROG	*NOx*	*CO*	*SO_2*	*PM-10*	*PM-2.5*
0.03	0.40	0.13	<0.01	0.02	0.01

Annual project-related air pollution emissions relative to federal standard attainment designations and appropriate *de minimis* thresholds are as follows:

Pollutant	Status* (Attainment, Non-Attainment or Unclassified)	Threshold of Significance for the Area	Construction Emissions (Tons/year)	Operation Emissions (Tons/year)
Ozone (1-hour)	n/a	-	-	-
Ozone (8-hour)	Extreme	10 (ROG) 10 (NOx)	0.44	0.03
PM-10	Serious	70	0.53	0.02
PM-2.5	Non-Attainment	100	0.21	0.01
CO	Attainment	100	2.07	0.13
NO_2	Attainment**	10 (NOx)	3.58	0.40
SO_2	Attainment	100	<0.01	<0.01

*Federal Standards
**May be redesignated non-attainment for the recently adopted 1-hour federal NO_2 standard

All annual emissions, both from construction and operations, are less than the applicable thresholds.

Local Significance Thresholds

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance. These analysis elements are called Local Significance Thresholds (LSTs). LSTs were developed in response to Governing Board's Environmental Justice Enhancement Initiative 1-4 and the LST methodology was adopted 2005.

Use of an LST analysis for a project is optional because they were derived for economically or socially disadvantaged communities. For this project LSTs are only applicable to construction activities. LSTs are only applicable to the following criteria pollutants: oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM-10 and PM-2.5). LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

Project activity occurring on the Valley Sanitation District site is not adjacent to any sensitive receptor. The project component which may affect adjacent sensitive uses, is the proposed pump stations and treatment facilities on Avenue 42.

LST pollutant concentration data is currently only published for 1, 2 and 5 acre sites for varying receptor distances. The local disturbance area for the proposed treatment plant and pump stations is approximately 2 acres. The closest residential receptors are approximately 50 feet from the nearest site boundary. Pollutant concentrations for a 2-acre disturbance area and for the minimal source-receptor distance of 25 meters are as follows (pounds per day):

Coachella Valley	**CO**	**NOx**	**PM-10**	**PM-2.5**
LST Threshold	1,229	191	7	2
Proposed Project				
Site Preparation	10	21	3	1
Construction	10	12	1	1

All emissions are below LST thresholds for construction.

GREENHOUSE GAS EMISSIONS

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statues and executive orders (EO) include AB 32, SB 1368, EO S-03-05, EO S-20-06 and EO S-01-07.

AB 32 is one of the most significant pieces of environmental legislation that California has adopted. Among other things, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." It will have wide-ranging effects on California businesses and lifestyles as well as far reaching effects on other states and countries. A unique aspect of AB 32, beyond its broad and wide-ranging mandatory provisions and dramatic GHG reductions are the short time frames within which it must be implemented. Major components of the AB 32 include:

- Require the monitoring and reporting of GHG emissions beginning with sources or categories of sources that contribute the most to statewide emissions.
- Requires immediate "early action" control programs on the most readily controlled GHG sources.
- Mandates that by 2020, California's GHG emissions be reduced to 1990 levels.
- Forces an overall reduction of GHG gases in California by 25-40%, from business as usual, over the next 9 years (by 2020).
- Must complement efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Statewide, the framework for developing the implementing regulations for AB 32 is under way. Additionally, through the California Climate Action Registry (CCAR now called the Climate Action Reserve), general and industry-specific protocols for assessing and reporting GHG emissions have been developed. GHG sources are categorized into direct sources (i.e. company owned) and indirect sources (i.e. not company owned). Direct sources include combustion

emissions from on-and off-road mobile sources, and fugitive emissions. Indirect sources include off-site electricity generation and non-company owned mobile sources.

Greenhouse Gas Emissions Significance Thresholds

In response to the requirements of SB97, the state Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to "select the model or methodology it considers most appropriate". The most common practice for transportation/combustion GHG emissions quantification is to use a computer model such as URBEMIS2007 as was used in the ensuing analysis.

The significance of those emissions then must be evaluated; the selection of a threshold of significance must take into consideration what level of GHG emissions would be cumulatively considerable. The guidelines are clear that they do not support a zero net emissions threshold. If the lead agency does not have sufficient expertise in evaluating GHG impacts, it may rely on thresholds adopted by an agency with greater expertise.

On December 5, 2008 the SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold for industrial projects where the SCAQMD is the lead agency (e.g., stationary source permit projects, rules, plans, etc.) of 10,000 Metric Tons CO_2 equivalent/year. As part of the Interim GHG Significance Threshold development process for industrial projects, the SCAQMD established a working group of stakeholders that also considered thresholds for commercial or residential projects. As discussed in the Interim GHG Significance Threshold guidance document, the focus for commercial projects is on performance standards and a screening level threshold. For discussion purposes, the SCAQMD's working group considered performance standards primarily focused on energy efficiency measures beyond Title 24 and a screening level of 3,000 metric tons (MT) CO_2 equivalent/year based on the relative GHG emissions contribution between non-industrial sectors versus stationary source (industrial) sectors. The working group and staff ultimately decided that additional analysis was needed to further define the performance standards and to coordinate with CARB staff's interim GHG proposal. Staff, therefore, did not recommend action for adopting an interim threshold for non-industrial projects but rather recommended bringing this item back to the Board for discussion and possible action. As of this date, no final action on a quantitative significance threshold has been taken. For purposes of analysis, wastewater treatment and recycling is considered "industrial" such that the 10,000 MT/year significance threshold is considered appropriate.

GHG Impact Analysis

GHG emissions would be potentially significant if the project would:

- Generate greenhouse gas emissions either directly or indirectly, that may have a significant impact on the environment.

- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Construction Activity GHG Emissions

During project construction, the URBEMIS2007 computer model predicts that the grading and construction activities will generate 498 "short" tons or 453 "metric" tons of CO_2 emissions. Equipment exhaust also contains small amounts of methane and nitric oxides which are also GHGs. Non-CO_2 GHG emissions represent approximately a one percent increase in CO_2-equivalent emissions from diesel equipment exhaust. For screening purposes, the temporary construction activity GHG emissions were compared to the chronic operational emissions in the SCAQMD's interim threshold of 10,000 tons per year. Worst year annual construction activities generating a total of 498 metric tons are well below this threshold. For construction activity emissions, SCAQMD GHG guidelines recommend that one-time construction emissions be amortized over the useful lifetime of the project. For a 30-year assumed project life, amortized GHG construction emissions would be 17 tons per year.

The project is anticipated to increase electrical consumption as follows:

ASR Wells:	Operate by gravity flow, no pumping
Booster Stations:	2.3 MW per booster station (assume 4)
Regen:	1.1 MW per day per treatment (assume 2)
Tertiary Treatment-VSD Plant Upgrade:	8 MW/day

Electricity use will result in GHG emissions from the fossil fueled fraction of Southern California's electrical resource. The California Climate Action Registry estimates that Southern California contributes 0.331 metric tons (MT) of GHG per megawatt hour (MWH) of electrical consumption.

Annual increased project electrical consumption and associated GHG generation was calculated as follows assuming full system operation for 365 days/year:

19.4 MW/day or 7,081 MW/year
7,081 MW/year x 0.331 MT/MW = 2,344 MT/year

The project is assumed to require 5 additional employees for which on-road travel will increase CO_2 by 28,640 lbs/year or 14.3 "short" tons or 13.0 "metric" tons per year. This is added to the 2,344 MT per year of CO2 increase from electrical consumption for a total operational increase of 2,357 MT/year.

The SCAQMD screening threshold of 10,000 metric tons per year of CO_2-equivalent GHG emissions will not be exceeded.

Both the construction and operations GHG emissions are far below the 10,000 MT per year advisory threshold for impact significance. The project generates limited levels of GHG emissions, and conversely offers few opportunities to effect any substantial reduction.

GHG emissions are implicated in the acceleration of global warming experienced in the last several decades. Climatic impacts are global in scale. Any project-specific contribution to the global issue is miniscule. In the absence of any definitive thresholds of significance, the GHG emphasis on a project-specific level is to incorporate project design features that reduce energy consumption and reduce vehicular travel as much as is reasonably feasible. As noted above, the small level of GHG emissions creates negligible opportunity for meaningful reduction.

The project will create reclaimed water and groundwater recharge of the underlying aquifer. The use of recycled water is encouraged and is considered GHG positive. Where available, recycled water shall be used as the source for irrigation and decorative water features.

MITIGATION

Construction activity emissions will not exceed SCAQMD significance thresholds. There will be negligible operational impacts associated with the project except for electrical consumption.

Nuisance minimization requires use of all available best management practices for dust control. A number of measures are suggested for dust control and emissions reduction as follows:

- Using best available control measures during soil disturbance. The menu of enhanced dust control measures includes the following:
  - Limit the disturbance "footprint" to as small an area as practical.
  - Water all active construction areas at least twice daily.
  - Cover all off-site haul trucks or maintain at least 2 feet of freeboard.
  - Pave or apply water four times daily to all unpaved parking or staging areas.
  - Sweep or wash any site access points within 30 minutes of any visible dirt deposition on any public roadway.
  - Cover or water twice daily any on-site stockpiles of debris, dirt or other dusty material.
  - Suspend all operations on any unpaved surface if winds exceed 25 mph.

- Limit allowable idling to 5 minutes for trucks and heavy equipment before shutting the equipment down.
- Utilize equipment whose engines are equipped with diesel oxidation catalysts if available.
- Utilize diesel particulate filter on heavy equipment where feasible.
- Utilize Tier 3 rated diesel engines for where possible.

A formal SIP consistency analysis is not required because total project emissions are less than EPA *de minimis* thresholds.

APPENDIX

URBEMIS2007 COMPUTER MODEL OUTPUT

2/2/2011 2:20:39 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name:

Project Name: IWA Wells

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	1.74	15.78	6.90	0.00	2.50	0.66	3.17	0.52	0.61	1.13	1,982.14
2012 TOTALS (lbs/day mitigated)	1.74	13.42	6.90	0.00	0.66	0.10	0.77	0.14	0.09	0.23	1,982.14

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/2/2011 2:20:39 PM

Time Slice 1/2/2012-2/29/2012 Active Days: 43	**1□□□**	**1□□□□**	**□90**	**0□00**	**2□□0**	**0□□□**	**3□1□**	**0□□2**	**0□□1**	**1□13**	**1□9□2□1□**
Mass Grading 01/01/2012-02/29/2012	1.74	15.78	6.90	0.00	2.50	0.66	3.17	0.52	0.61	1.13	1,982.14
Mass Grading Dust	0.00	0.00	0.00	0.00	2.50	0.00	2.50	0.52	0.00	0.52	0.00
Mass Grading Off Road Diesel	1.72	15.74	6.23	0.00	0.00	0.66	0.66	0.00	0.61	0.61	1,888.87
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.02	0.04	0.67	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.27

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Generator Sets (549 hp) operating at a 0.74 load factor for 4 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 1/2/2012-2/29/2012 Active Days: 43	**1□□□**	13.42	**□90**	**0□00**	0.66	0.10	0.77	0.14	0.09	0.23	**1□9□2□1□**
Mass Grading 01/01/2012-02/29/2012	1.74	13.42	6.90	0.00	0.66	0.10	0.77	0.14	0.09	0.23	1,982.14
Mass Grading Dust	0.00	0.00	0.00	0.00	0.66	0.00	0.66	0.14	0.00	0.14	0.00
Mass Grading Off Road Diesel	1.72	13.38	6.23	0.00	0.00	0.10	0.10	0.00	0.09	0.09	1,888.87
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.02	0.04	0.67	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.27

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Generator Sets, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Pumps, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Welders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/2/2011 2:21:19 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/□ear)

File Name:

Project Name: IWA Wells

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (tons/year unmitigated)	0.04	0.34	0.15	0.00	0.05	0.01	0.07	0.01	0.01	0.02	42.62
2012 TOTALS (tons/year mitigated)	0.04	0.29	0.15	0.00	0.01	0.00	0.02	0.00	0.00	0.01	42.62
Percent Reduction	0.00	14.96	0.00	0.00	73.47	84.63	75.80	73.37	84.66	79.45	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/2/2011 2:21:19 PM

2012	0.04	0.34	0.15	0.00	0.05	0.01	0.07	0.01	0.01	0.02	42.62
Mass Grading 01/01/2012-02/29/2012	0.04	0.34	0.15	0.00	0.05	0.01	0.07	0.01	0.01	0.02	42.62
Mass Grading Dust	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.04	0.34	0.13	0.00	0.00	0.01	0.01	0.00	0.01	0.01	40.61
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Generator Sets (549 hp) operating at a 0.74 load factor for 4 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/2/2011 2:21:19 PM

2012	0.04	0.29	0.15	0.00	0.01	0.00	0.02	0.00	0.00	0.01	42.62
Mass Grading 01/01/2012-02/29/2012	0.04	0.29	0.15	0.00	0.01	0.00	0.02	0.00	0.00	0.01	42.62
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.04	0.29	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.61
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Generator Sets, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Generator Sets, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Pumps, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Pumps, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Welders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Welders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/2/2011 2:29:1 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:Documents and SettingsSara GericApplication DataUrbemisVersion9aProjectsIWA Pipelines.urb924

Project Name: IWA Pipelines

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	4.06	34.64	16.41	0.00	5.01	1.62	6.63	1.05	1.49	2.54	4,092.44
2012 TOTALS (lbs/day mitigated)	4.06	29.46	16.41	0.00	1.33	0.25	1.58	0.28	0.23	0.51	4,092.44

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 1/2/2012-2/29/2012 Active Days: 43	□0□	3□□□	1□□1	0□00	□01	1□2	□□3	1□0□	1□9	2□□□	□092□□
Mass Grading 01/01/2012-02/29/2012	4.06	34.64	16.41	0.00	5.01	1.62	6.63	1.05	1.49	2.54	4,092.44
Mass Grading Dust	0.00	0.00	0.00	0.00	5.00	0.00	5.00	1.04	0.00	1.04	0.00
Mass Grading Off Road Diesel	4.00	34.53	14.40	0.00	0.00	1.61	1.61	0.00	1.48	1.48	3,812.63
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.06	0.11	2.01	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.81

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 2

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Concrete/Industrial Sa□s (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

2/2/2011 2:29:1□ PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/2/2012-2/29/2012 Active Days: 43	**□0□**	29.46	**1□□1**	**0.00**	1.33	0.25	1.58	0.28	0.23	0.51	**□092□□**
Mass Grading 01/01/2012-02/29/2012	4.06	29.46	16.41	0.00	1.33	0.25	1.58	0.28	0.23	0.51	4,092.44
Mass Grading Dust	0.00	0.00	0.00	0.00	1.32	0.00	1.32	0.28	0.00	0.28	0.00
Mass Grading Off Road Diesel	4.00	29.35	14.40	0.00	0.00	0.24	0.24	0.00	0.22	0.22	3,812.63
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.06	0.11	2.01	0.00	0.01	0.01	0.02	0.00	0.01	0.01	279.81

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Plate Compactors, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

2/2/2011 2:29:1□ PM

NO□: 15□

For Concrete/Industrial Sa□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Concrete/Industrial Sa□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rollers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Excavators, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Excavators, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/2/2011 2:29:□1 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/□ear)

File Name: C:□Documents and Settings□Sara Gerric□□Application Data□Urbemis□Version9a□Projects□IWA Pipelines.urb924

Project Name: IWA Pipelines

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (tons/year unmitigated)	0.09	0.74	0.35	0.00	0.11	0.03	0.14	0.02	0.03	0.05	87.99
2012 TOTALS (tons/year mitigated)	0.09	0.63	0.35	0.00	0.03	0.01	0.03	0.01	0.00	0.01	87.99
Percent Reduction	0.00	14.95	0.00	0.00	73.40	84.54	76.12	73.26	84.58	79.90	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/2/2011 2:29:□1 PM

2012	0.09	0.74	0.35	0.00	0.11	0.03	0.14	0.02	0.03	0.05	87.99
Mass Grading 01/01/2012-02/29/2012	0.09	0.74	0.35	0.00	0.11	0.03	0.14	0.02	0.03	0.05	87.99
Mass Grading Dust	0.00	0.00	0.00	0.00	0.11	0.00	0.11	0.02	0.00	0.02	0.00
Mass Grading Off Road Diesel	0.09	0.74	0.31	0.00	0.00	0.03	0.03	0.00	0.03	0.03	81.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.02

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 2

Maximum Daily Acreage Disturbed: 0.5

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Concrete/Industrial Sa□s (10 hp) operating at a 0.73 load factor for 8 hours per day

1 Cranes (399 hp) operating at a 0.43 load factor for 8 hours per day

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

2 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Plate Compactors (8 hp) operating at a 0.43 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Mitigated

2/2/2011 2:29:□1 PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012	0.09	0.63	0.35	0.00	0.03	0.01	0.03	0.01	0.00	0.01	87.99
Mass Grading 01/01/2012-02/29/2012	0.09	0.63	0.35	0.00	0.03	0.01	0.03	0.01	0.00	0.01	87.99
Mass Grading Dust	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.01	0.00
Mass Grading Off Road Diesel	0.09	0.63	0.31	0.00	0.00	0.01	0.01	0.00	0.00	0.00	81.97
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.02

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 2/29/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Plate Compactors, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Plate Compactors, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/2/2011 2:29:□1 PM

For Concrete/Industrial Sa□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Concrete/Industrial Sa□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rollers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rollers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Excavators, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Excavators, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/□/2011 2:0□:2□ PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:□Documents and Settings□Sara Gerric□□Application Data□Urbemis□Version9a□Projects□IWA□IWA Reservoirs.urb924

Project Name: IWA Reservoirs

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	4.55	39.31	19.51	0.01	2.51	1.75	4.26	0.53	1.61	2.13	4,344.86
2012 TOTALS (lbs/day mitigated)	4.55	33.43	19.51	0.01	0.67	0.27	0.94	0.14	0.25	0.39	4,344.86

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/□/2011 2:0□:2□ PM

Time Slice 1/2/2012-1/13/2012 Active Days: 10	□□□□	**39□31**	**19□□1**	0.00	**2□□1**	**1□□□**	**□2□**	**0□□3**	**1□□1**	**2□13**	**□3□□□□**
Mass Grading 01/01/2012-01/14/2012	4.55	39.31	19.51	0.00	2.51	1.75	4.26	0.53	1.61	2.13	4,344.86
Mass Grading Dust	0.00	0.00	0.00	0.00	2.50	0.00	2.50	0.52	0.00	0.52	0.00
Mass Grading Off Road Diesel	4.51	39.23	17.95	0.00	0.00	1.74	1.74	0.00	1.60	1.60	4,127.23
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.05	0.09	1.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	217.63
Time Slice 1/16/2012-2/15/2012 Active Days: 23	1.54	12.27	8.99	**0□01**	0.02	0.69	0.71	0.01	0.63	0.64	1,776.91
Building 01/15/2012-02/15/2012	1.54	12.27	8.99	0.01	0.02	0.69	0.71	0.01	0.63	0.64	1,776.91
Building Off Road Diesel	1.36	10.53	6.13	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,171.02
Building Vendor Trips	0.14	1.65	1.22	0.00	0.01	0.06	0.08	0.00	0.06	0.06	378.36
Building Wor□er Trips	0.05	0.09	1.63	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 1/14/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

2 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Rubber Tired Do□ers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 8 hours per day

2/□/2011 2:0□:2□ PM

Phase: Building Construction 1/15/2012 - 2/15/2012 - Type □our Description □ere

Off-Road E□uipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 For□lifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 6 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/2/2012-1/13/2012 Active Days: 10	□□□□	33.43	**19□□1**	0.00	0.67	0.27	0.94	0.14	0.25	0.39	□**3**□□□□
Mass Grading 01/01/2012-01/14/2012	4.55	33.43	19.51	0.00	0.67	0.27	0.94	0.14	0.25	0.39	4,344.86
Mass Grading Dust	0.00	0.00	0.00	0.00	0.66	0.00	0.66	0.14	0.00	0.14	0.00
Mass Grading Off Road Diesel	4.51	33.34	17.95	0.00	0.00	0.26	0.26	0.00	0.24	0.24	4,127.23
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.05	0.09	1.56	0.00	0.01	0.01	0.02	0.00	0.01	0.01	217.63
Time Slice 1/16/2012-2/15/2012 Active Days: 23	1.54	10.69	8.99	**0□01**	0.02	0.16	0.19	0.01	0.15	0.16	1,776.91
Building 01/15/2012-02/15/2012	1.54	10.69	8.99	0.01	0.02	0.16	0.19	0.01	0.15	0.16	1,776.91
Building Off Road Diesel	1.36	8.95	6.13	0.00	0.00	0.09	0.09	0.00	0.09	0.09	1,171.02
Building Vendor Trips	0.14	1.65	1.22	0.00	0.01	0.06	0.08	0.00	0.06	0.06	378.36
Building Wor□er Trips	0.05	0.09	1.63	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52

2/□/2011 2:0□:2□ PM

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 1/14/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Excavators, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Excavators, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Graders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Do□ers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

2/□/2011 2:0□:2□ PM

PM10: 85□ PM25: 85□

For Rubber Tired Do□ers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

The follo□ing mitigation measures apply to Phase: Building Construction 1/15/2012 - 2/15/2012 - Type □our Description □ere

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For For□lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For For□lifts, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/□/2011 2:0□:□1 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/□ear)

File Name: C:□Documents and Settings□Sara Gerric□□Application Data□Urbemis□Version9a□Projects□IWA□IWA Reservoirs.urb924

Project Name: IWA Reservoirs

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (tons/year unmitigated)	0.04	0.34	0.20	0.00	0.01	0.02	0.03	0.00	0.02	0.02	42.16
2012 TOTALS (tons/year mitigated)	0.04	0.29	0.20	0.00	0.00	0.00	0.01	0.00	0.00	0.00	42.16
Percent Reduction	0.00	14.09	0.00	0.00	71.73	80.61	76.75	70.52	80.68	79.14	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2012	0.04	0.34	0.20	0.00	0.01	0.02	0.03	0.00	0.02	0.02	42.16
Mass Grading 01/01/2012-01/14/2012	0.02	0.20	0.10	0.00	0.01	0.01	0.02	0.00	0.01	0.01	21.72
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.02	0.20	0.09	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.64
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09
Building 01/15/2012-02/15/2012	0.02	0.14	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.43
Building Off Road Diesel	0.02	0.12	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	13.47
Building Vendor Trips	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35
Building Wor□er Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.62

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 1/14/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

2 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Rubber Tired Do□ers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 1/15/2012 - 2/15/2012 - Type □our Description □ere

2/□/2011 2:0□:□1 PM

Off-Road E□uipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 For□lifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 6 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012	0.04	0.29	0.20	0.00	0.00	0.00	0.01	0.00	0.00	0.00	42.16
Mass Grading 01/01/2012-01/14/2012	0.02	0.17	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.72
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.02	0.17	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.64
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09
Building 01/15/2012-02/15/2012	0.02	0.12	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.43
Building Off Road Diesel	0.02	0.10	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.47
Building Vendor Trips	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35
Building Wor□er Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.62

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 1/14/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

2/□/2011 2:0□:□1 PM

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Excavators, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Excavators, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Graders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Graders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Do□ers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Do□ers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

The follo□ing mitigation measures apply to Phase: Building Construction 1/15/2012 - 2/15/2012 - Type □our Description □ere

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

2/□/2011 2:0□:□1 PM

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For For□lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For For□lifts, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/□/2011 2:11:1□ PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:□Documents and Settings□Sara Gerric□□Application Data□Urbemis□Version9a□Projects□IWA□IWA Booster Stations.urb924

Project Name: IWA Booster Stations

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	2.27	20.87	8.91	0.01	2.50	0.77	3.27	0.52	0.71	1.23	2,233.77
2012 TOTALS (lbs/day mitigated)	2.27	17.75	8.91	0.01	0.66	0.13	0.78	0.14	0.12	0.25	2,233.77

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/□/2011 2:11:1□ PM

Time Slice 1/2/2012-1/6/2012 Active Days: 5	**2.2□**	**20.□□**	**□.91**	0.00	**2.□0**	**0.□□**	**3.2□**	**0.□2**	**0.□1**	**1.23**	**2,233.□□**
Mass Grading 01/01/2012-01/06/2012	2.27	20.87	8.91	0.00	2.50	0.77	3.27	0.52	0.71	1.23	2,233.77
Mass Grading Dust	0.00	0.00	0.00	0.00	2.50	0.00	2.50	0.52	0.00	0.52	0.00
Mass Grading Off Road Diesel	2.25	20.83	8.24	0.00	0.00	0.77	0.77	0.00	0.70	0.70	2,140.50
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.02	0.04	0.67	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.27
Time Slice 1/9/2012-3/30/2012 Active Days: 60	1.13	9.27	6.95	**0.01**	0.02	0.49	0.52	0.01	0.45	0.46	1,444.41
Building 01/07/2012-03/30/2012	1.13	9.27	6.95	0.01	0.02	0.49	0.52	0.01	0.45	0.46	1,444.41
Building Off Road Diesel	0.94	7.53	4.09	0.00	0.00	0.42	0.42	0.00	0.39	0.39	838.52
Building Vendor Trips	0.14	1.65	1.22	0.00	0.01	0.06	0.08	0.00	0.06	0.06	378.36
Building Wor□er Trips	0.05	0.09	1.63	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□ Travel (VMT): 0

Off-Road E□uipment:

1 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Rubber Tired Do□ers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 1/7/2012 - 3/30/2012 - Type □our Description □ere

Off-Road E□uipment:

2/□/2011 2:11:1□ PM

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 For□lifts (145 hp) operating at a 0.3 load factor for 4 hours per day

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 4 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 4 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/2/2012-1/6/2012 Active Days: 5	**2.2□**	17.75	**□91**	0.00	0.66	0.12	0.78	0.14	0.11	0.25	**2,233□□□**
Mass Grading 01/01/2012-01/06/2012	2.27	17.75	8.91	0.00	0.66	0.12	0.78	0.14	0.11	0.25	2,233.77
Mass Grading Dust	0.00	0.00	0.00	0.00	0.66	0.00	0.66	0.14	0.00	0.14	0.00
Mass Grading Off Road Diesel	2.25	17.71	8.24	0.00	0.00	0.11	0.11	0.00	0.11	0.11	2,140.50
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.02	0.04	0.67	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.27
Time Slice 1/9/2012-3/30/2012 Active Days: 60	1.13	8.14	6.95	**0.01**	0.02	0.13	0.16	0.01	0.12	0.13	1,444.41
Building 01/07/2012-03/30/2012	1.13	8.14	6.95	0.01	0.02	0.13	0.16	0.01	0.12	0.13	1,444.41
Building Off Road Diesel	0.94	6.40	4.09	0.00	0.00	0.06	0.06	0.00	0.06	0.06	838.52
Building Vendor Trips	0.14	1.65	1.22	0.00	0.01	0.06	0.08	0.00	0.06	0.06	378.36
Building Wor□er Trips	0.05	0.09	1.63	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

2/□/2011 2:11:1□ PM

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Do□ers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Do□ers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

The follo□ing mitigation measures apply to Phase: Building Construction 1/7/2012 - 3/30/2012 - Type □our Description □ere

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For For□lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For For□lifts, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

2/□/2011 2:11:1□ PM

PM10: 85□ PM25: 85□

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/□/2011 2:11:3□ PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/□ear)

File Name: C:□Documents and Settings□Sara Gerric□□Application Data□Urbemis□Version9a□Projects□IWA□IWA Booster Stations.urb924

Project Name: IWA Booster Stations

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (tons/year unmitigated)	0.04	0.33	0.23	0.00	0.01	0.02	0.02	0.00	0.02	0.02	48.92
2012 TOTALS (tons/year mitigated)	0.04	0.29	0.23	0.00	0.00	0.00	0.01	0.00	0.00	0.00	48.92
Percent Reduction	0.00	12.62	0.00	0.00	65.93	74.00	71.62	61.65	74.13	72.98	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/□/2011 2:11:3□ PM

2012	0.04	0.33	0.23	0.00	0.01	0.02	0.02	0.00	0.02	0.02	48.92
Mass Grading 01/01/2012-01/06/2012	0.01	0.05	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	5.58
Mass Grading Dust	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Building 01/07/2012-03/30/2012	0.03	0.28	0.21	0.00	0.00	0.01	0.02	0.00	0.01	0.01	43.33
Building Off Road Diesel	0.03	0.23	0.12	0.00	0.00	0.01	0.01	0.00	0.01	0.01	25.16
Building Vendor Trips	0.00	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.35
Building Wor□er Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.83

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□ Travel (VMT): 0

Off-Road E□uipment:

1 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 8 hours per day

1 Rubber Tired Do□ers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 1/7/2012 - 3/30/2012 - Type □our Description □ere

Off-Road E□uipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 For□lifts (145 hp) operating at a 0.3 load factor for 4 hours per day

2/□/2011 2:11:3□ PM

1 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 4 hours per day

1 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 4 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012	0.04	0.29	0.23	0.00	0.00	0.00	0.01	0.00	0.00	0.00	48.92
Mass Grading 01/01/2012-01/06/2012	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.58
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Building 01/07/2012-03/30/2012	0.03	0.24	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.33
Building Off Road Diesel	0.03	0.19	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.16
Building Vendor Trips	0.00	0.05	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.35
Building Wor□er Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.83

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

2/□/2011 2:11:3□ PM

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Do□ers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Do□ers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

The follo□ing mitigation measures apply to Phase: Building Construction 1/7/2012 - 3/30/2012 - Type □our Description □ere

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For For□lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For For□lifts, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Loaders, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Loaders, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/□/2011 2:1□:3□ PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:□Documents and Settings□Sara Gerric□□Application Data□Urbemis□Version9a□Projects□IWA□IWA Regenerable Treatment.urb924

Project Name: IWA Regen. Treatment

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	1.73	15.53	7.48	0.01	1.20	0.59	1.80	0.25	0.55	0.80	1,630.62
2012 TOTALS (lbs/day mitigated)	1.73	13.21	7.48	0.01	0.32	0.14	0.41	0.07	0.12	0.15	1,630.62

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2/□/2011 2:1□:3□ PM

Time Slice 1/2/2012-1/6/2012 Active Days: 5	**1□□3**	**1□□□3**	**□□□□**	0.00	**1□20**	**0□□9**	**1□□0**	**0□2□**	**0□□□**	**0□□0**	**1□□30□□2**
Mass Grading 01/01/2012-01/06/2012	1.73	15.53	7.48	0.00	1.20	0.59	1.80	0.25	0.55	0.80	1,630.62
Mass Grading Dust	0.00	0.00	0.00	0.00	1.20	0.00	1.20	0.25	0.00	0.25	0.00
Mass Grading Off Road Diesel	1.71	15.50	6.81	0.00	0.00	0.59	0.59	0.00	0.54	0.54	1,537.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.02	0.04	0.67	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.27
Time Slice 1/9/2012-1/30/2012 Active Days: 16	1.07	8.54	6.65	**0□01**	0.02	0.50	0.52	0.01	0.45	0.46	1,368.47
Building 01/07/2012-01/30/2012	1.07	8.54	6.65	0.01	0.02	0.50	0.52	0.01	0.45	0.46	1,368.47
Building Off Road Diesel	0.89	6.79	3.80	0.00	0.00	0.42	0.42	0.00	0.39	0.39	762.59
Building Vendor Trips	0.14	1.65	1.22	0.00	0.01	0.06	0.08	0.00	0.06	0.06	378.36
Building Wor□er Trips	0.05	0.09	1.63	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 0.5

Maximum Daily Acreage Disturbed: 0.12

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 4 hours per day

1 Rubber Tired Do□ers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Building Construction 1/7/2012 - 1/30/2012 - Type □our Description □ere

Off-Road E□uipment:

2/□/2011 2:1□:3□ PM

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 For□lifts (145 hp) operating at a 0.3 load factor for 4 hours per day

2 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 4 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/2/2012-1/6/2012 Active Days: 5	**1□□3**	13.21	□□□□	0.00	0.32	0.09	0.41	0.07	0.08	0.15	**1□□30□□2**
Mass Grading 01/01/2012-01/06/2012	1.73	13.21	7.48	0.00	0.32	0.09	0.41	0.07	0.08	0.15	1,630.62
Mass Grading Dust	0.00	0.00	0.00	0.00	0.32	0.00	0.32	0.07	0.00	0.07	0.00
Mass Grading Off Road Diesel	1.71	13.17	6.81	0.00	0.00	0.09	0.09	0.00	0.08	0.08	1,537.35
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.02	0.04	0.67	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.27
Time Slice 1/9/2012-1/30/2012 Active Days: 16	1.07	7.52	6.65	**0□01**	0.02	0.14	0.16	0.01	0.12	0.13	1,368.47
Building 01/07/2012-01/30/2012	1.07	7.52	6.65	0.01	0.02	0.14	0.16	0.01	0.12	0.13	1,368.47
Building Off Road Diesel	0.89	5.77	3.80	0.00	0.00	0.06	0.06	0.00	0.06	0.06	762.59
Building Vendor Trips	0.14	1.65	1.22	0.00	0.01	0.06	0.08	0.00	0.06	0.06	378.36
Building Wor□er Trips	0.05	0.09	1.63	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

2/□/2011 2:1□:3□ PM

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Do□ers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Do□ers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

The follo□ing mitigation measures apply to Phase: Building Construction 1/7/2012 - 1/30/2012 - Type □our Description □ere

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For For□lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For For□lifts, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

2/□/2011 2:1□:20 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/□ear)

File Name: C:□Documents and Settings□Sara Gerric□□Application Data□Urbemis□Version9a□Projects□IWA□IWA Regenerable Treatment.urb924

Project Name: IWA Regen. Treatment

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (tons/year unmitigated)	0.01	0.11	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	15.02
2012 TOTALS (tons/year mitigated)	0.01	0.09	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.02
Percent Reduction	0.00	13.03	0.00	0.00	68.96	75.94	73.36	66.17	76.05	74.84	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2012	0.01	0.11	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	15.02
Mass Grading 01/01/2012-01/06/2012	0.00	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.08
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.00	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.84
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Building 01/07/2012-01/30/2012	0.01	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.95
Building Off Road Diesel	0.01	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.10
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.03
Building Wor□er Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82

Phase Assumptions

Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 0.5

Maximum Daily Acreage Disturbed: 0.12

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truc□Travel (VMT): 0

Off-Road E□uipment:

1 Other Material □andling E□uipment (191 hp) operating at a 0.59 load factor for 4 hours per day

1 Rubber Tired Do□ers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Water Truc□s (189 hp) operating at a 0.5 load factor for 4 hours per day

Phase: Building Construction 1/7/2012 - 1/30/2012 - Type □our Description □ere

Off-Road E□uipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

1 For□lifts (145 hp) operating at a 0.3 load factor for 4 hours per day

2/□/2011 2:1□:20 PM

2 Tractors/Loaders/Bac□hoes (108 hp) operating at a 0.55 load factor for 4 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per □ear, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012	0.01	0.09	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.02
Mass Grading 01/01/2012-01/06/2012	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.08
Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.84
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Wor□er Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Building 01/07/2012-01/30/2012	0.01	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.95
Building Off Road Diesel	0.01	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.10
Building Vendor Trips	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.03
Building Wor□er Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82

Construction Related Mitigation Measures

The follo□ing mitigation measures apply to Phase: Mass Grading 1/1/2012 - 1/6/2012 - Default Mass Site Grading/Excavation Description

For Soil Stabli□ing Measures, the Apply soil stabili□ers to inactive areas mitigation reduces emissions by:

PM10: 84□ PM25: 84□

For Soil Stabli□ing Measures, the Replace ground cover in disturbed areas □uic□ly mitigation reduces emissions by:

PM10: 5□ PM25: 5□

For Soil Stabli□ing Measures, the Water exposed surfaces 2x daily □atering mitigation reduces emissions by:

PM10: 55□ PM25: 55□

For Water Truc□s, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

2/□/2011 2:1□:20 PM

PM10: 85□ PM25: 85□

For Water Truc□s, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Rubber Tired Do□ers, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Rubber Tired Do□ers, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Other Material □andling E□uipment, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Other Material □andling E□uipment, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

The follo□ing mitigation measures apply to Phase: Building Construction 1/7/2012 - 1/30/2012 - Type □our Description □ere

For Cranes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Cranes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For For□lifts, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For For□lifts, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

For Tractors/Loaders/Bac□hoes, the Diesel Particulate Filter (DPF) 1st Tier mitigation reduces emissions by:

PM10: 85□ PM25: 85□

For Tractors/Loaders/Bac□hoes, the Diesel Oxidation Catalyst 15□ mitigation reduces emissions by:

NO□: 15□

Biological Resources Assessment & Survey Report

For The
Indio Water Authority's
Recycled Water Program

Prepared for:

Indio Water Authority
83-101 Avenue 43
Indio, California 92201

Prepared by:

Tom Dodson & Associates
2150 North Arrowhead Avenue
San Bernardino, California 92405

CERTIFICATION: *"I hereby certify that the statements furnished herein and in the attached exhibits present the data and information required for this evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Fieldwork conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project."*

Shay Lawrey
Prepared November 2010

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1 Introduction

The purpose of this biological resources assessment and survey report is to provide information and to review the proposed project in sufficient detail to determine to what extent it may affect threatened or endangered species, and species of concern or that are proposed for listing. The document presents technical information upon which decisions regarding project impacts can be reached. The extent of the study area covers the immediate areas directly and indirectly affected by the proposed project.

The City of Indio Water Authority (IWA) proposes to treat wastewater flows from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) for re-use on large scale irrigation sites within or adjacent to the City and for possible groundwater recharge of the underlying aquifer. The proposed project would include (1) installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water, (2) installation and/or conversion and operation of pipelines for recycled water conveyance, (3) installation and operation of one or more groundwater recharge treatment facilities, and (4) installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge.

Currently, VSD discharges approximately 6.5 million gallons per day (MGD) of treated effluent to the unlined Coachella Valley Stormwater Channel (hereafter, Channel), which discharges into the Salton Sea approximately 13 miles downstream of the VSD outlet. The Channel northwest of the VSD WWTP discharge is dry except during periods of intense rainfall, which are rare given that the area averages only 3 inches of rain per year. The Channel southeast of the VSD outlet supports riparian vegetation by the combined flows from storm water runoff, VSD WWTP, Coachella Valley Water District (CVWD) WWTP, the City of Coachella Sanitary District and irrigation flow returns from agricultural fields. The constructed wetlands treatment system located at the VSD WWTP currently processes approximately 1 MGD of treated effluent which is mixed with effluent from the pond system and discharged to the Channel.

With implementation of the proposed tertiary treatment facilities to the VSD WWTP, discharges into the channel would be reduced and the existing wetlands treatment facility could be eliminated. The project proposes to divert a large portion of the tertiary treated effluent from the VSD WWTP to recycled water projects, thereby reducing its current discharge into the channel of 6.5 MGD to approximately to 0.5 MGD.

The VSD treated effluent comprises the primary flows supporting riparian vegetation in the first 1.5 miles downstream from the outlet. The minimum quantity of VSD flows that will be required to maintain riparian vegetation in the Channel has been estimated at about 0.5 MGD. Therefore, it is assumed that the proposed reduction in discharges to 0.5 million gallons per day by the VSD WWTP into the Channel would be sufficient to maintain the riparian vegetation.

2 Study Area

The project can be found in the Cities of Indio and La Quinta, Riverside County, California within Township 5 South, Range 7 East and Township 5 South, Range 8 East, San Bernardino Baseline and Meridian on the U.S. geological Survey (USGS) - Indio, Myoma, La Quinta, and West Berdoo Canyon, 7.5 Minute Series quadrangle topographic maps.

The project area is located in a fully developed urban/suburban setting in the Coachella Valley, a northwest-southeast trending desert valley that constitutes the western end of the Colorado Desert. Dictated by this geographic setting, the climate and environment of the region are typical of southern California's desert country, marked by extremes in temperature and aridity. Temperatures often reach over 120 degrees in summer, and dip to near freezing in winter. Average annual precipitation is less than five inches, and the average annual evaporation rate exceeds three feet.

The proposed project includes the installation of approximately 22 linear miles of alternative pipeline routes and the installation of a tertiary treatment system, one or more groundwater recharge treatment facilities, and new aquifer storage recovery (ASR) wells, or the conversion of existing wells to ASR functions. (Please note that the biological study area did not include the potential four new ASR well sites because their exact location or configuration had not been determined at the time of the biological evaluation.)

The biological study area encompassed all areas potentially affected by the project which include the constructed wetlands treatment ponds located at the VSD WWTP (Ponds), the channel southeast of the VSD outlet downstream for 1.5 miles (Channel), the proposed locations of the tertiary treatment system facilities (Treatment Facilities) at the VSD WWTP, proposed location of recharge facilities near Posse Park, and pipeline routes (Figures 1-3).

3 Methods

3.1 Records Search and Literature Review

Background information was gathered prior to visiting this site to obtain information on species occurrence in the project vicinity. The biological surveyor examined the California Natural Diversity Data Base (CNDDB). The CNDDB search was conducted for the USGS – Indio, Myoma, La Quinta, and West Berdoo Canyon Quadrangles, 7.5 Minute Series topographic maps. This resource provided baseline data regarding species occurrences within the project vicinity. The September 2007 Re-circulated Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) was also consulted to gather background information on known biological resources occurrences and conservation areas relative to the project area.

3.2 General Biological Survey

On April 5, May 9, and May 19 2010, Tom Dodson & Associates (TDA) biologist, Shay Lawrey, conducted general biological surveys within the project study area by noting habitat types, disturbance levels, and animal species. Ms. Lawrey walked the proposed tertiary treatment facilities locations, proposed recharge locations, and around each of the constructed wetlands ponds within the VSD WWTP. For the pipeline routes, Ms. Lawrey drove the proposed alignments and conducted pedestrian surveys in adjacent areas that contained open and accessible land. In addition to the general biological surveys, Ms. Lawrey conducted habitat suitability evaluations in accordance with the relevant, species specific, habitat evaluation guidelines for burrowing owl *(Athene cunicularia*).

3.3 Botanical Survey

On April 5, 2010, Contract Botanist, C.J. Fotheringham PhD, conducted botanical surveys around the constructed wetlands ponds located at the VSD WWTP and within the channel southeast of the VSD outlet downstream for 1.5 miles. Ms. Fotheringham identified plant species in the field but if a species was unknown, Ms. Fotheringham took a photo or collected relevant pieces of the plant for later identification using a Leica 7-35x dissecting scope and floras such as the Jepson Manual of the California Flora, Manual of North American Grasses, and Calflora.org. A GPS (Delorme PN-40) was carried and waypoints were collected during the survey.

3.4 Focused Avian Survey of the Channel

Between April 15 and July 17, 2010, Ms. Lawrey surveyed the riparian habitat within Channel southeast of the VSD outlet downstream for 1.5 miles for the least Bell's vireo Vireo bellii pusillus (LBVI) and southwestern willow flycatcher Empidonax trallii extimus (SWWF) pursuant to her USFWS Permit (TE-094308-0) and according to the recommended guidelines provided by the USFWS in the "Survey Protocol for the Southwestern Willow Flycatcher" (1997 and updated June 2010) and the "Survey Protocol for the Least Bell's Vireo (1999), as modified through an agreement with the USFWS.

The U.S. Fish and Wildlife Service (USFWS) determined the endangered status for LBVI in 1986 and SWWF in 1995 pursuant to the provisions of the Endangered Species Act of 1973, as amended (Act). Prior to the federal listings, the State of California had determined the endangered status for LBVI and SWWF in 1980 and 1992, respectively. These birds were once readily found in the riparian habitats of southern California, but their range has diminished significantly in recent decades. The primary causes of their population declines are habitat loss and habitat degradation. The listings of LBVI and SWWF under the Act triggered the protective measures of Section 9(a) of the Act, which prohibits the Take of listed species. Take is defined in the Act in Section 3(18) as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect. Additionally, the Act requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species, or destroy or adversely modify its critical habitat, if any is designated. This survey was warranted due to the presence of suitable habitat within the channel and the project's proposal to reduce discharges into the Channel.

The habitat type and structure within the Channel southeast of the VSD outlet downstream for 1.5 miles is considered suitable for LBVI and SWWF because woody, riparian vegetation is present in stands larger than 0.5 acres in size with over 50 percent cover of dense clumps of vegetation consisting of an understory, a midstory, and an overstory (see Photos). Per requirements of the USFWS and CDFG the focused avian surveys were conducted areas supporting a mosaic of cottonwood (*Populus fermontii*), willow (*Salix* spp), and other riparian vegetative associations that is densely structured in a two or three-story canopy.

The LBVI protocol requires eight surveys to be conducted at least 10 days apart from April 10 to July 31 and the SWWF protocol requires five surveys at least five days apart between May 15 and July 17. One SWWF survey is to occur in the first period between May 15 -31, two surveys are to occur in the second period between June 1-21, and two surveys are to be performed in the third period between June 22 and July 17 (see attached data sheets). The SWWF surveys were performed concurrently with LBVI surveys.
Surveys consisted of slowly moving through the habitat while listening for the songs and calls of the two target species. During the SWWF surveys, recordings of their vocalizations were broadcast every 20-30 meters, as required by protocol.

The purpose of the surveys was to determine the presence or absence of either of these federally listed species within the riparian habitat from the VSD outlet downstream for 1.5 miles.

4 Results

According to Figure 4-22d, and 6-2 of the CVMSHCP, no aspect of the project falls within the desert tortoise and linkage conservation area or within the Coachella Valley fringe-toed lizard preserve.

There are 40 special status species documented within the Indio, Myoma, La Quinta and West Berdoo Canyon Quadrangles (CNDDB 2008 updated September 2010). Of these 40 sensitive species, suitable habitat exists adjacent to the eastern pipeline routes and to the Channel for 10 species which include the Palm Springs pocket mouse, chaparral sand-verbena, burrowing owl, flat-tailed horned lizard, American badger, Crissal thrasher, Le Conte's thrasher, Coachella Valley fringe-toed lizard, Palm Springs round-tailed ground squirrel, and Mecca-aster. Each of these species has been documented within 2 miles of the study area boundaries which are bounded by the pipeline routes.

Common wildlife observations included scat, tracks, burrows, nest, calls, and individual animals. Tracks and scat were observed from a number of common mammals, such as cotton-tail rabbit (*Sylvalegus audoboni*), desert woodrat (*Neotoma lepida*), California ground squirrel (*Spermophillys becheyii*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*) and coyote (*Canus latrans*). Several common birds known locally were easily observed, such as the common raven, red-tail hawk, American kestrel, western mockingbird, European starling, grackle, brewer's blackbird, western bluebird, house finch, brown-headed cowbird, and mourning dove. The western fence lizard *(Sceloporus occidentalis),* San Diego alligator lizard *(Gerrhonotus multicarinatus webbi)* and gopher snake *(Pituophis melanoleucus annectens)* were common reptiles found during the survey. Amphibians heard or observed include the western toad (*Bufo boreus*) and bullfrog.

4.1 Treatment Facilities

The tertiary treatment system facilities are proposed at alternative locations within the existing VSD WWTP which is an existing operational and maintained site that contains various buildings, water treatment facilities, introduced landscaping plants, and paved, gravel and/or compacted dirt access roads and parking areas. The locations of the proposed facilities consist of disturbed bare ground and/or disturbed ruderal vegetation. No suitable habitat capable of supporting any sensitive species exists on site. No sensitive species or evidence of sensitive species was observed during the survey. The results show that no sensitive biological resources occur in the areas proposed for the tertiary treatment system facilities.

4.2 Recharge Facilities

The groundwater recharge facilities are proposed near Posse Park, north of 42nd street, east of the Indio Municipal Golf Course and west of the Terra Lago Golf Club. The proposed locations contain open, previously disturbed ground and compacted dirt access paths. The ground cover in these locations consists of disturbed bare ground and/or disturbed ruderal vegetation. No sensitive species or evidence of sensitive species was observed during the survey. There is a potential for burrowing owl to move into one of these areas and set up a territory. No other

sensitive species has the potential to occur within the proposed recharge locations due to the lack of suitable habitat and level of disturbance.

4.3 Ponds

Coastal and valley freshwater marsh habitat (Holland community 52410) occurs around the constructed wetland treatment pond margins. The habitat surrounding the open water of the ponds is largely dominated by *Bolboschoenus (Scirpus) maritimus* (>90% of the vegetation cover) with some *Salix sp., Atrriplex sp.* and *Heliotropium curassavicum* near the edges.

The Ponds constitute an environmentally rich area of high avian diversity. These ponds function as a secluded wetland ecosystem in the middle of the desert and provide a small link in the Pacific Flyway, as birds migrate along coastal corridor. They provide open water and marsh habitats for nesting and foraging. Due to the inviting expanse of habitat, the ponds also function as a public bird viewing area. Several species of resident, migratory, and special status birds visit or live at the ponds. The most common birds observed at the ponds during the survey include eared grebes, ruddy ducks, black-necked silts, lesser yellow legs, common loons, Canada geese, cinnamon teals, greater scaups, common goldeneyes, common moorhens, western gulls, common terns, brown pelicans, snowy egrets, Wilson's phalarope, least bitterns, and mallards.

Because of the loss of inland wetlands in southern California, these constructed ponds have become an unplanned mitigation wetlands. Birds depend on the ponds and flourish because of them, regardless of their origin or purpose. The birds don't know or care that the source of the water in ponds is effluent; it is a situation where wildlife has become dependent on a human-altered landscape.

Four individuals of *Abronia villosa* were found near the raptor houses located adjacent to the ponds. See species relevant discussion below. The variety could not be determined due to lack of seeds this early in the season.

4.4 Channel

4.4.1 Habitat

Ownership of the survey area was unclear, but it appears the survey area occurs in the Cabazon Indian Reservation and is maintained by the Reservation and possibly the Riverside County Flood Control District. Maintenance for flood control is the primary cause of disturbance within the channel. The center flow line of the channel from the VSD outlet downstream for 1.5 miles supports Sonoran cottonwood-willow riparian forest (Holland community 61810) habitat. Dense riparian stands vary between 30' to 75' in width, are fairly consistent in plant composition, and consist of an intricate three to four story canopy structure, with trees standing approximately 35, 20, and 5 feet tall with over 65 percent vegetative cover. The under story consists of cattail and other native herbaceous riparian plants. The stands, primarily composed of arroyo, black and sandbar willow (*Salix lasiolepis, S. gooddingii* and *S. exigua*), cottonwood (*Populus fremonti*), Scirpus (*Bolboschoenus maritimus),* slatcedar (*Tamarix ramosissima*), and *Arundo donax* form a closed canopy over the stream area. Flowing and pooled water was present during survey and based upon the extensive riparian growth and presence of fish in the water, this section of stream appears to flow year round.

Higher on the channel banks may have at one time been mesquite bosque (Holland community 61820) or desert dry wash woodland (62200) but currently lacks the characteristic fabaceae shrub species (Figure 4). The vegetative cover up the sides of the channel is typical of desert dry washes and other disturbed, sandy areas. Dominant species include *Pluchea sericea* (arrowweed), *Suaeda moquinii* (inkweed), *Tamarix ramosissima* (saltcedar) and *Salsola spp.* (Russian thistle).

The vegetation upstream of VSD outlet is markedly different with no apparent permanent wetlands (see photos located in back). Species were the same as was seen downstream on the higher sides of the channel with *T. ramosissima*, *P. sericea*, and *S. moquinii* being the most dominant by cover. A total 42 plant species were encountered, 19 (45%) of which were non-native. One species encountered is potentially a special status variety.

4.4.2 Plants

Of the 18 special status plant species identified in the CNDDB, potential habitat exists within the channel for 15 special status plant species. One species, *Abronia villosa*, was found but whether it was the special status variety *aurita* or the more common variety *villosa* could not be determined at the time of the surveys. Considering the apparent extensive and ongoing mechanical disturbance on the banks of the channel it is not surprising that others were not present.

Abronia villosa var. *aurita* is an annual, glandular-hairy that is prostrate to ascending generally less than 3'. Leaves are triangular-ovate to round 0.5-2" long and 0.5-1.8" wide with a petiole 0.2-2" long. Flowers have a pink perianth tube 0.8-1.4' long and a magenta limb less than 0.6" wide. Flowers are in a 15-35 flower inflorescence on a long peduncle (0.8-4") with lanceolate or narrowly ovate bracts 0.1-0.4" long. This species flowers between March and August. Fruits are a smooth achene 0.2-0.4" long with a hardened beak with wide wings that extend above the body. *Abronia villosa* var. *aurita* occurs below 5000' throughout much of southern California in sandy places in creosote-bush, coastal-sage scrub, chaparral plant communities.

There is only one occurrence *Abronia villosa* var. *aurita* six miles to the south in the USGS quadrangles however, a search of the California Consortium of Herbaria indicates a collection ~ six miles to the west as well as an additional 19 collections within the greater Palm Springs area whose exact locations are unknown. There are also many collections for *Abronia villosa* var. *villosa*, including to collections 2.5 and 4.5 to the east of the site and eight whose exact location is unknown.

Five individuals of *Abronia villosa* were found scattered on higher areas of the bank. The variety could not be determined due to lack of seeds this early in the season. Regardless of which variety is present on the site, it is unlikely that changes in water flow would have any affect on this species as it is not a wetland species and responds to seasonal rains.

4.4.3 Wildlife

Ninety bird species were detected during the 2010 focused surveys. The most frequently detected species were birds typical of lowland riparian habitats in southern California such as the mourning dove (*Zenaida macroura*), black-chinned hummingbird (*Archilochus alexandri*), black phoebe (*Sayornis nigricans*), bushtit (*Psaltriparus minimus*), house wren (*Troglodytes aedon*), yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), and lesser goldfinch (*Spinus psaltria*).

No LBVI or SWWF were detected during the survey and no aspect of the survey limited the results. The focused survey results show that LBVI and SWWF do not currently occupy the Channel from the VSD outlet downstream for 1.5 miles. No LBVI or SWWF were seen or heard over the course of the 12 week survey period and according to the CNDDB (September 2010 update), these species have not been documented in the Indio, Myoma, la Quinta or West Berdoo Canyon quads. Given the absence of LBVI and SWWF within the study area, there is no risk of taking individuals of either species in conjunction with implementing the proposed project.

Up on the south side of the channel bank a nesting pair of burrowing owl was observed.

4.5 Pipeline Routes

4.5.1 Habitat

The pipeline routes generally extend from Dillon Road on the northeast to Adams Street on the west and Avenue 48 on the south. Most of the proposed pipeline routes lie within the pavement of existing rights-of-way of various public roadways and parking lots. There a few small segments of the pipeline routes that occur in dirt access roads and undeveloped fields. Existing land use along the pipeline routes includes retail businesses and residential neighborhoods.

Portions of the pipeline routes (along 42nd Avenue and from Van Buren Street east along 44th Avenue and north along Dillon Road) lie adjacent to open land that primarily contains patches of Sonoran creosote bush scrub and desert saltbush scrub habitats and randomly scattered pockets of Desert Sink scrub and stabilized desert sand field habitats.

Sonoran creosote bush scrub is the most widespread vegetation type in the Colorado Desert. It is dominated by creosote bush (*Larrea tridentata*) and co-domintated by burrobush (*Ambrosia dumosa)*. The transition to desert saltbush occurs as the soil becomes heavier and the salt content increases. Sonoran creosote bush scrub has low species diversity and the broad spacing of the shrubs, usually with bare ground between.

Desert saltbush scrub includes various species of saltbush in a nearly uniform stand of shrubs, forming a more complete cover than in creosote bush scrub. This community occupies areas where fine-textured, poorly drained soils with high salinity and/or alkalinity occur. One or more species of *Atriplex* are dominant in this community, including allscale (*Atriplex polycarpa)* and four-winged saltbush (*Atriplex canescens* var. *linearis*).

Desert Sink scrub occurs at lower elevations on poorly drained moist to wet soils with high alkalinity and/or salinity. Desert sink scrub appears to displace desert saltbush scrub in areas of a high water table and a salt crust at the surface. Pickleweed (*Salicornia virginica*), iodine bush (*Allenrolfea occidentalis*), and bush seepweed (*Suaeda moquinii)* are characteristic of this community.

A stabilized sand field is located west of Dillon Road and east of the Terra Lago Golf Club. This sand accumulation is characterized by consistent cover of vegetation stabilized by shrubs, scattered low annuals, and perennial grasses. This community intergrades with the sandier phases of adjacent creosote bush scrub and includes perennial plant species such as creosote bush, four-wing saltbush, California croton, and indigo bush.

4.5.2 Wildlife

According to Figure 4-20b of the CVMSHCP, the pipeline route along Dillion Road traverses part of the East Indio Hills Conservation Area which includes Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel conserved habitat.

The adjacent habitats described above in Section 4.4.1 provide suitable habitat for Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel and for burrowing owl and crissal thrasher.

None of these species or evidence of these species was observed during the survey. The project information provided at the time of survey indicated that the construction envelope for pipeline installation would occur entirely within paved and/or dirt road Rights-of-Way and that no aspect of construction, including side casting, would go beyond the exiting developed road ways and encroach into open land.

5 Regulatory Compliance Framework

5.1 CVMSHCP

The project occurs within the CVMSHCP Planning area and after careful review of the project details as they relate to the CVMSHCP, TDA determines that the project is consistent with the goals and policies of the CVMSHCP. No further action is required.

5.2 Potentially Relevant Water Quality Regulations

Portions of the pipeline routes cross or follow along the Coachella Valley Stormwater Channel, which is a jurisdictional channel. If the project results in alterations to the bed, banks or channel of the Coachella Valley Stormwater Channel, then the following regulatory framework may apply.

5.2.1 Clean Water Act (CWA)

The CWA is the principal federal law that governs pollution in the nation's lakes, rivers, and coastal waters. Originally enacted in 1972 as a series of amendments to the Federal Water Pollution Control Act of 1948 the Act was last amended in 1987. The overriding purpose of the CWA is to "restore and maintain the chemical, physical and biological integrity of the nation's waters." The statute employs a variety of regulatory and non-regulatory tools to eliminate the discharge of pollutants into the nation's waters and achieve water quality that is both "swimmable and fishable". Section 303 of CWA requires that states establish ambient water quality standards for water bodies, consisting of the beneficial use or uses of a water body (e.g. recreation, public water supply, etc.), and the water quality criteria necessary to protect the use or uses. Section 303(d) requires states to identify waters that are impaired by pollution, even after application of pollution controls.

5.2.2 Porter-Cologne Water Quality Control Act

Porter-Cologne Water Quality Control Act is the principal state law that governs water protection efforts in California. Enacted in 1969, sections of the state law served as the basis for the

federal Clean Water Act of 1972. Porter-Cologne establishes the State Water Resources Control Board and each of the nine Regional Water Quality Control Boards as the principal state agencies for coordinating and controlling water quality in California. The Regional Boards issue CWA NPDES permits (see below) to selected point-source discharges and either waste discharge requirements or conditional water quality certifications for other discharges.

5.2.3 California Fish and Game Code

Sections 1600 to 1616 of the California Fish and Game Code require any person, state, or local government agency or public utility to notify the California Department of Fish and Game (CDFG) before beginning any activity that will substantially modify a river, stream, or lake. If it is determined that the activity could substantially adversely impact an existing fish and wildlife resource, a Lake or Streambed Alteration Agreement is required.

5.3 Potentially Relevant Regulatory Agencies

5.3.1 U.S. Army Corps of Engineers

The Corps regulates discharges of dredged or fill material into waters of the United States. Waters of the United States include wetlands and non-wetland bodies of water that meet specific criteria. The Corps' regulatory jurisdiction pursuant to Section 404 of the Federal CWA is founded on a connection, or nexus, between the water body in question and interstate commerce. This connection may be direct through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce, or may be indirect, through a nexus identified in the Corps regulations. One of the mechanisms adopted by Congress to achieve restoration and maintenance of the chemical, physical, and biological integrity of the Nation's waters is a prohibition on the discharge of any pollutants, including dredged or fill material, into "navigable waters" except in compliance with other specified sections of the Act.

5.3.2 Regional Water Quality Control Board

The RWQCB's regulatory jurisdiction is pursuant to Section 401 of the Federal CWA. The RWQCB typically regulates discharges of dredged or fill material into *Waters of the United States*, however they also have regulatory authority over waste discharges into Waters of the State, which may be isolated, under the Porter-Cologne Water Quality Control Act issued by the State Water Resources Board. In the absence of a nexus with the Corps, the Regional Board requires the submittal of a Waste Discharge Requirement (WDR) application, which must include a copy of the project Stormwater Pollution Prevention Plan (SWPPP) and a copy of the project Water Quality Management Plan (WQMP), otherwise called a Standard Urban Stormwater Management Plan (SUSMP). The Regional Board's role is to ensure that disturbances in the stream channel do not cause water quality degradation.

5.3.3 California Department of Fish and Game

Unlike the Corps, CDFG regulates not only the discharge of dredged or fill material, but all activities that alter streams and lakes and their associated habitats. The CDFG, through provisions of the California Fish and Game Code (Sections 1601-1603), is empowered to issue agreements for any alteration of a river, stream, or lake where fish or wildlife resources may be

adversely affected. Streams (and rivers) are defined by the presence of a channel bed and banks, and at least an intermittent flow of water. The CDFG typically extends the limits of their jurisdiction laterally beyond the channel banks for streams that support riparian vegetation. In these situations the outer edge of the riparian vegetation is generally used as the lateral extent of the stream and CDFG jurisdiction. CDFG regulates wetland areas only to the extent that those wetlands are a part of a river, stream, or lake as defined by CDFG.

The CDFG administers the California Endangered Species Act (CESA). The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management and a rare species is one present in such small numbers throughout its range that it may become endangered if its present environment worsens. Rare species applies to California native plants. The State definition of “take” is narrow and specifically refers to the direct loss of a State listed species.

Provisions within the California Fish and Game Code protect all native birds of prey and their nests (FGC §3503.5), and all non-game birds (other than those not listed as Fully Protected) that occur naturally in the State (§38oo). The handful of species, such as the California condor, that are designated by the State as “fully protected” received this rare designation through special legislation. There is no mechanism allowed for CDFG to issue take authorization for a fully protected species. Species of Special Concern is an informal designation used by CDFG for some declining wildlife species that are not proposed for listing as threatened or endangered, such as the burrowing owl. This designation does not provide legal protection, but signifies that these species are recognized as sensitive by CDFG.

6 Conclusions & Recommendations

6.1 Treatment Facilities

Since no suitable habitat capable of supporting any sensitive species exist on site, there is no risk of any sensitive species being impacted by the installation of the proposed treatment facilities. No sensitive biological resources occur in the areas proposed for the tertiary treatment system facilities. Therefore, this aspect of the project will not result in direct or indirect impacts to threatened or endangered species, species of concern or species proposed for listing. Further study or analysis is not warranted or required.

Installation of the treatment system facilities will not result in the loss of a listed species and will not result in the modification of sensitive habitat.

6.2 Recharge Facilities

As stated above the proposed recharge locations consist of disturbed bare ground and/or ruderal vegetation. Although no sensitive species were found and none are expected to occur, these locations should be re-evaluated for burrowing owl prior to construction.

6.3 Ponds

The possible elimination of the constructed wetland treatment ponds would result in an adverse impact on the migrating and resident water fowl that currently utilize the ponds for resting,

foraging and nesting. The ponds provide a unique open water habitat feature that many species of birds have come to depend on. In addition the ponds are frequented by novice and avid birders.

Therefore, it is recommended that elimination of the ponds be avoided. If total avoidance is not possible, then it is recommended that at least half of the pond system be retained and remain functional.

6.4 Channel

The riparian habitat in the channel contains a dense mixture of native and non-native vegetative components that have grown into a multi layered canopy with intricate structure. This habitat is considered suitable for LBVI and SWWF and as such focused surveys were conducted to determine their presence or absence. No LBVI or SWWF were detected during the 2010 focused surveys. A burrowing owl pair was however, located on south side (dry side) of the south bank the channel approximately 0.8 miles downstream of the outfall. Additionally, five individuals of *Abronia villosa* were found scattered on higher areas of the north side (wet side) of the south bank. The variety (special status variety *aurita* or the more common variety *villosa*) could not be determined due to lack of seeds this early in the season. Regardless of which variety is present on the site, any proposed changes in the water discharge regime are unlikely to affect on *Abronia villosa* or burrowing owl since they are not wetland or riparian obligate species.

Neotropical migrants such as the yellow-rumped warbler *(Dendroica coronata),* orange-crowned warbler *(Vermivora celata),* blackthroated gray warbler *(Dendroica nigrescens),* MacGillivray's warbler *(Oporornis tolmiet),*white-crowned sparrow *(Zonotrichia leucophrys),* golden-crowned sparrow *(Zonotrichia atricapilla),* song sparrow *(Melospiza melodia),* common yellowthroat *(Geothlypis trichas),* yellow warbler *(Dendroica petechia),* yellow-breasted chat *(Icteria virens),* and ruby-crowned kinglet *(Regulus calendula)* depend on the deciduous riparian trees and shrubs growing in the Channel for foraging during migration. The mature trees provide numerous cavities for cavity-dependent wildlife and the tall trees are used by nesting raptors.

Currently, up to 6.5 MGD of effluent is discharged into the Channel from the VSD WWTP. The project proposes to reduce discharges to 0.5 MGD and according to the water balance study prepared for this project, discharges of 0.5 MGD will be sufficient to maintain the riparian vegetation growing in the center flowline of the channel. Under this assumption, the habitat will remain unaffected.

To ensure that the riparian habitat remains in form and function within the channel following reductions in effluent discharge, specific actions are recommended. These actions include: 1) exotic plant removal; 2) botanical monitoring; and 3) wildlife monitoring. In addition, any habitat loss of greater than 20 percent in spatial extent or quality, as determined by the vegetation monitoring is recommended to be offset by habitat restoration or replacement.

It is recommended that the IWA, in coordination with the Cabazon Indian Reservation, implement a long-term habitat and wildlife monitoring plan that includes either compensation into an existing exotic species removal program or implementation of such program.

There is a good potential for habitat restoration and enhancement through implementation of an exotic species control and management program. This area has heavy salt cedar and arundo

components. Rehabilitation of this area could restore the degraded habitat (with approximately half non-native plant species) back to its previous native habitat condition and enhance the function of the existing habitat by converting scattered “pockets” of nonnative vegetation to native vegetation. Restoration and enhancement of this area would increase the habitat continuity and ecological integrity of the area and would provide more functional habitat.

Restoration should include nonnative species removal, maintenance and monitoring. Following the removal of the target non-native species (such as slat cedar and arundo, the site could be allowed to passively revegetate back into a riparian woodland. It may be necessary however, to include an active component or manipulation to the passive revegetation in order augment the process and add canopy structure. The intent of active revegatation following nonnative species removal is to replace tree canopy cover as soon as possible, to prevent the colonization of a new different noxious species and prevent temporal habitat loss for migratory birds and local resident wildlife.

One of the primary requirements of an exotics removal program is to avoid impacts to existing native plants and wildlife species. Habitat and wildlife monitoring of the Channel should begin the first year of decreased effluent discharges. The purpose of the monitoring is to document the changes in habitat over time. General botanical and wildlife monitoring should be conducted for no less than five years. Annual monitoring, including focused protocol LBVI and SWWF surveys, will provide baseline data and will help identify short-term changes in the habitat conditions.

Qualitative habitat monitoring should focus on habitat type, habitat conditions, limits of habitat type area, botanical species diversity, structure, recruitment rates, and any significant disease or pest problems. During site monitoring, a qualified biologist should list the invasive exotic species that need to be removed and map where they occur. Monitoring should be performed in the spring, between April and July, to help record an accurate representation of perennial and annual herbaceous plants on-site. Specific, sampling grids and transects should be set for the annual monitoring. Permanent photo stations should be set within the grids and transects to provide a visual photo log to track of the changes in habitat over time. All wildlife species detected by sight, track, or sign within the monitoring areas should be recorded. More intensive protocol level, LBVI and SWWF surveys should also be conducted by a permitted biologist. This data will show how the habitat is functioning for the benefit of wildlife over time.

A qualified biologist should prepare the monitoring reports that will review the botanical and wildlife monitoring results, and progress of the restoration and enhancement area relative the exotic species removal program. An important component to these reports will be photographs from the permanent photo stations. An effective monitoring program can provide valuable information on the effects of an action (effluent discharge reduction) and the need to modify the action. Monitoring for this project would involve the collection and interpretation of biological resource data for five consecutive years and documentation of the effects of the action on the biological resources of concern.

Implementation of these recommendations would be contingent upon the cooperation of and concurrence by the Cabazon Indian Reservation.

6.5 Pipeline Routes

Although Figure 4-20b of the CVMSHCP indicates that the proposed pipeline route along Dillon Road traverses part of the East Indio Hills Conservation Area, no adverse direct impact will result to Le Conte's thrasher, flat-tailed horned lizard, and Coachella Valley round-tailed ground squirrel conserved habitat since the construction envelope lies entirely within paved roadways. Based on the information provided, pipeline installation will occur entirely within paved and/or dirt road Rights-of-Way and no aspect of construction, including side casting, would go beyond the exiting developed road ways and encroach into open land. Given these facts, no direct, adverse impacts to biological resources will result from installing the pipelines.

However, indirect impacts may result from pipeline installation. For example native botanical populations may be indirectly impacted as a result of increases in dust which negatively impacts pollinator activity and increased the seed pool of alien species. Therefore, this type of indirect impact should be mitigated by implementing standard 'Best Management Practices' (BMPs) including dust control measures and washing of equipment before it reaches the site (if feasible).

Considering that portions of the pipeline routes (along 42nd Avenue and from Van Buren Street east along 44th Avenue and north along Dillon Road) lie adjacent to open land that contain patches of native habitat (such as Sonoran creosote bush scrub, desert saltbush scrub, desert sink scrub, and stabilized desert sand field) the following recommendations are provided to avoid and/or minimize potential indirect adverse impacts to biological resources.

A qualified biologist should conduct a 30-day pre-construction survey of the pipeline installation construction areas to ensure that no sensitive animal or plant has taken up residence adjacent to a pipeline route. Following the pre-construction survey the biologist will make a determination: (1) if a biological monitor should be present at the site during all land disturbance activities; or (2) if no further action is required. The biologist/monitor should remain on-call during construction activities. If by chance a sensitive species is encountered during construction following the initial phases of ground disturbance, construction activities shall be halted in the vicinity of the find and the biologist/monitor called to the site. The contractor shall implement the recommendations of the biologist/monitor who will coordinate with the resource agencies.

All personnel associated with the construction on the site shall attend a worker education class. This class should include general information regarding all sensitive species and their habitat known to occur in the near vicinity of the project. Particular attention should be made to the various flora and fauna, habitat types onsite, and regulations. The class should provide relevant information regarding the Federal and State laws and worker responsibilities when working in desert habitat.

The project should take care to not interrupt the integrity of connectivity for wildlife movement. Potential indirect adverse impacts to adjacent natural areas and organisms include a variety of factors resulting from increased disturbance due to visitation by humans: for example, loss of efficiency in foraging and other activities due to distraction and interference, increased invasion by non-native plants and animals due to human transport, and. For the proposed project, all project activities will be limited to a well-defined area. Prior to pipeline installation construction activities the limits of disturbance will be clearly marked with some visual marker such as flagging. Defining a visual delineation of the construction foot-print will serve to protect the natural integrity of the site by preventing accidental intrusion and degradation in the adjacent undisturbed habitat areas.

It is assumed that since the pipelines will be installed entirely within disturbed road ways, no vegetation removal will occur. Although, it is understood that no vegetation will be removed as part of the pipeline installation, it should be noted that the State of California prohibits the take of active bird nests and that if any vegetation removal became necessary as part of the pipeline installation, then it would have to be done outside of the State identified nesting season (nesting season is March15 through September 1). Alternatively, the vegetation slated for removal can be evaluated by a qualified biologist prior to initiation of ground disturbance to determine the presence or absence of nesting birds. If an active nest is located in the project construction area it will be flagged and a 300 foot buffer placed around it. No activity will occur within the 300 foot buffer until the young have fledged the nest.

In conclusion, the pipeline routes may affect the Coachella Valley Stormwater Channel. If the the bed banks or channel are to be altered by the project, then permits from the Corps, RWQCB, and CDFG may be required. Permits potentially required include CWA Sections 404 and 401 permits, and a Fish and Game Code, Section 1602, Streambed Alteration Agreement.

7 References

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Unitt, P. 1987. Empidonax traillii extimus: An endangered subspecies. W. Birds 18:137-162.

Figures

Figure 1. Location Map

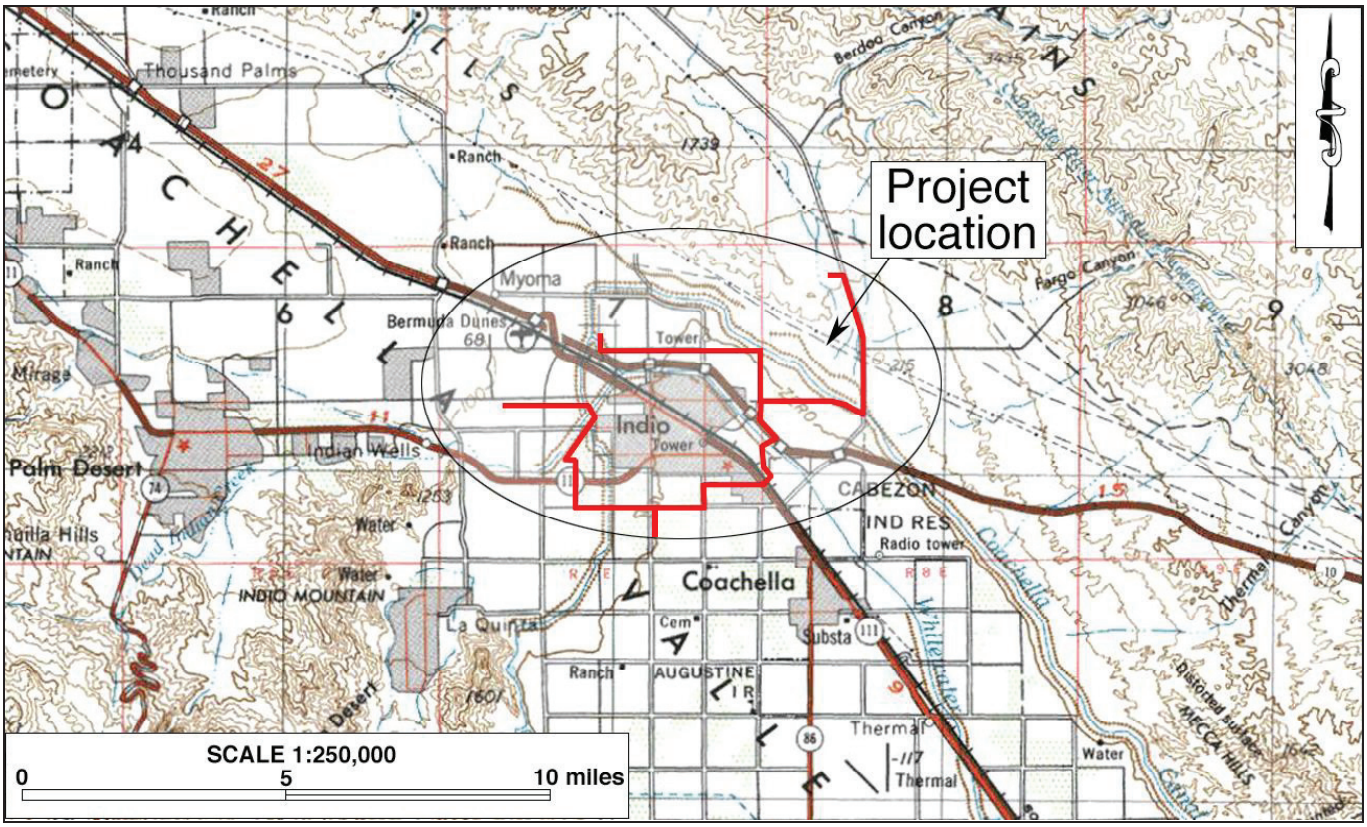


Figure 2a. Western Portion of Study Area

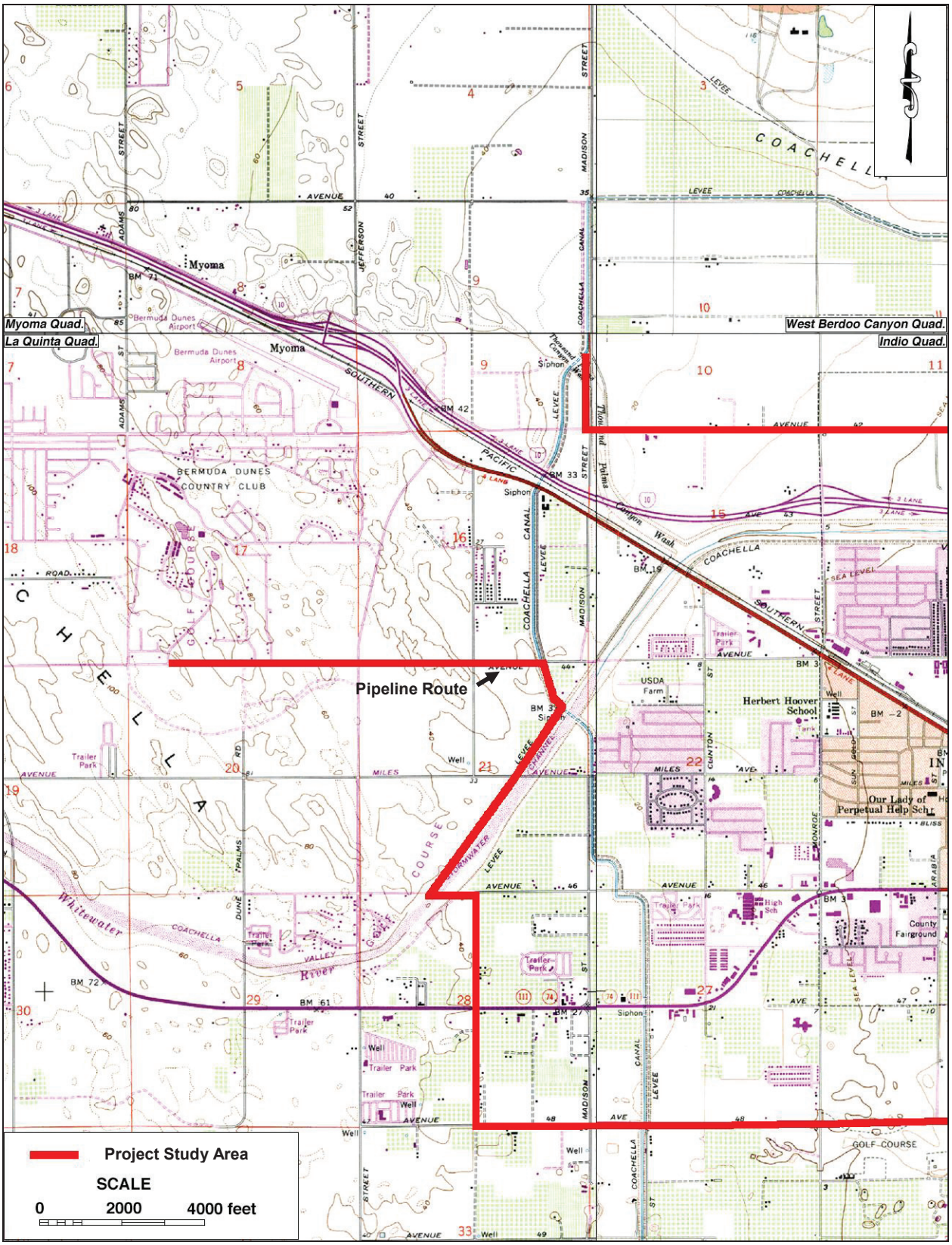


Figure 2b. Eastern Portion of Study Area

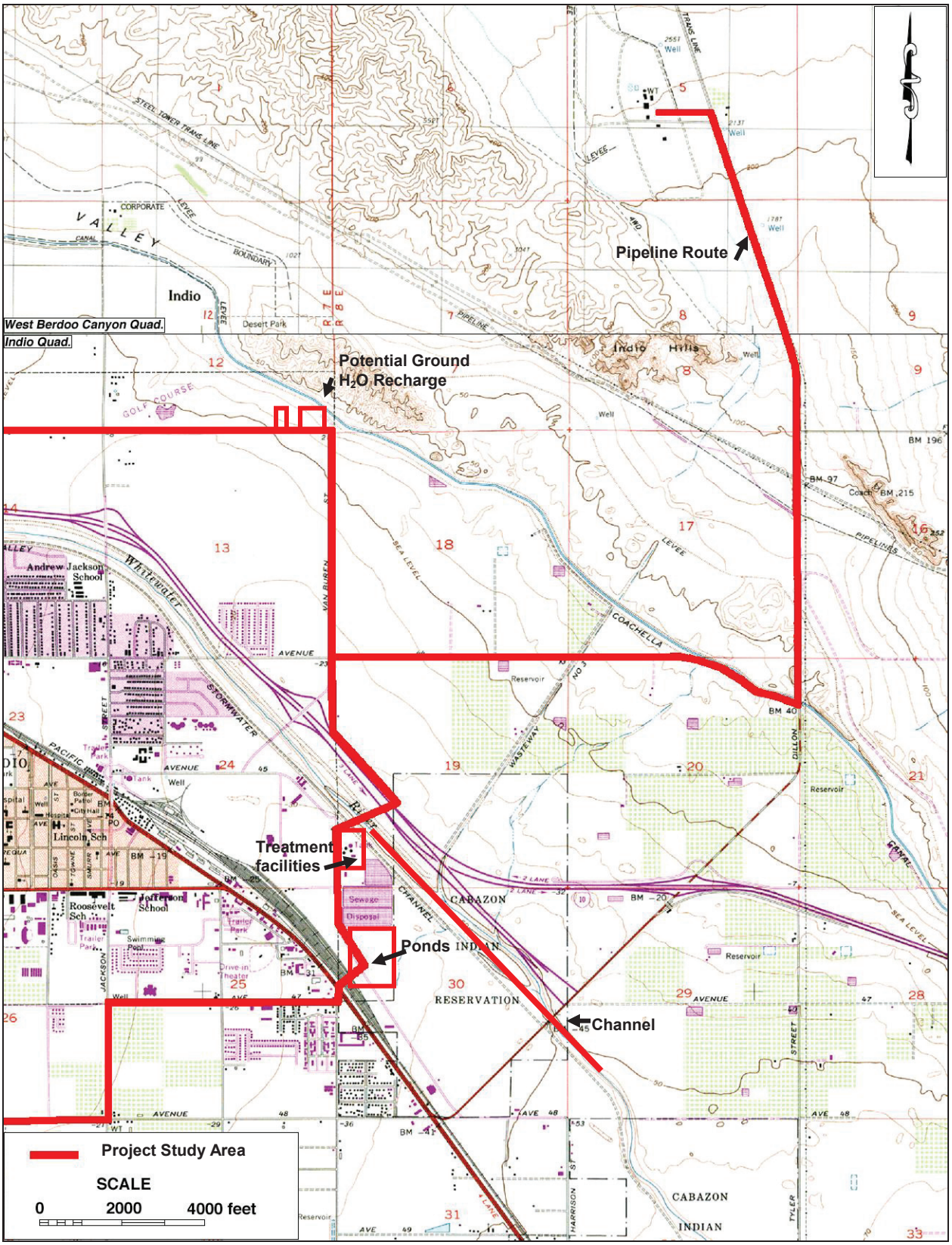


Figure 2c. South part of Eastern Portion of Study Area

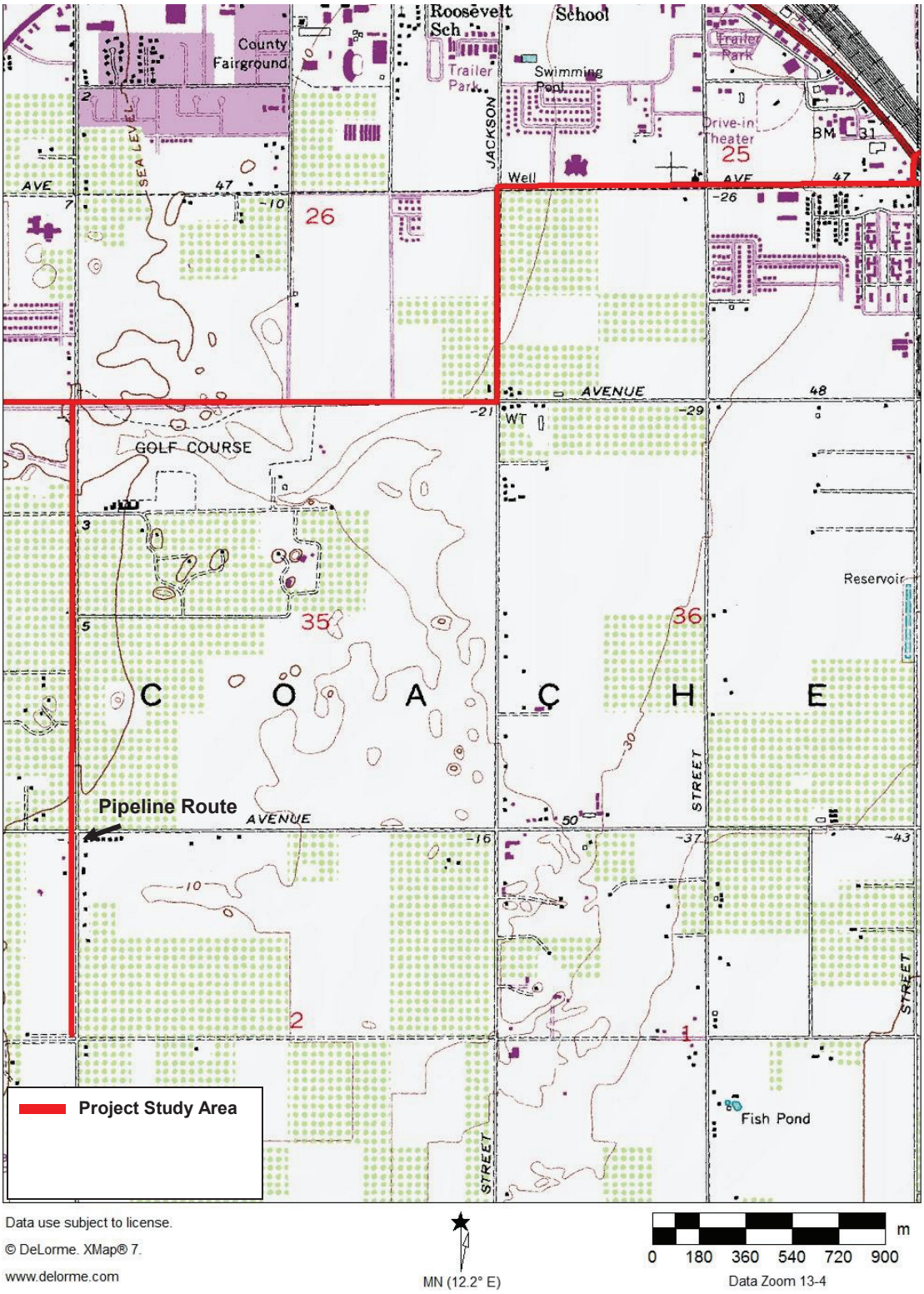


Figure 3. LBVI and SWWF Survey Area in the Channel & Location of Burrowing Owl

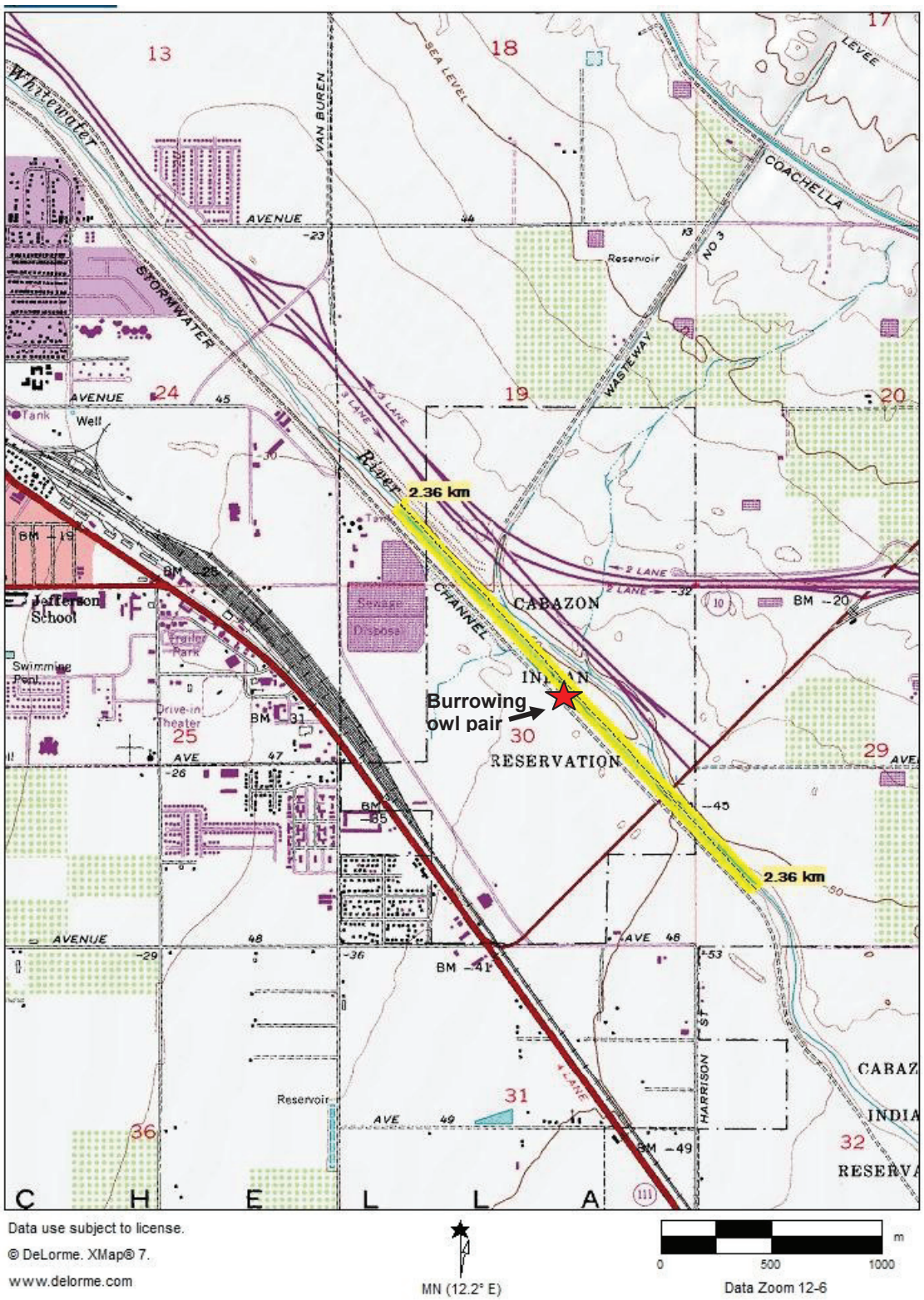
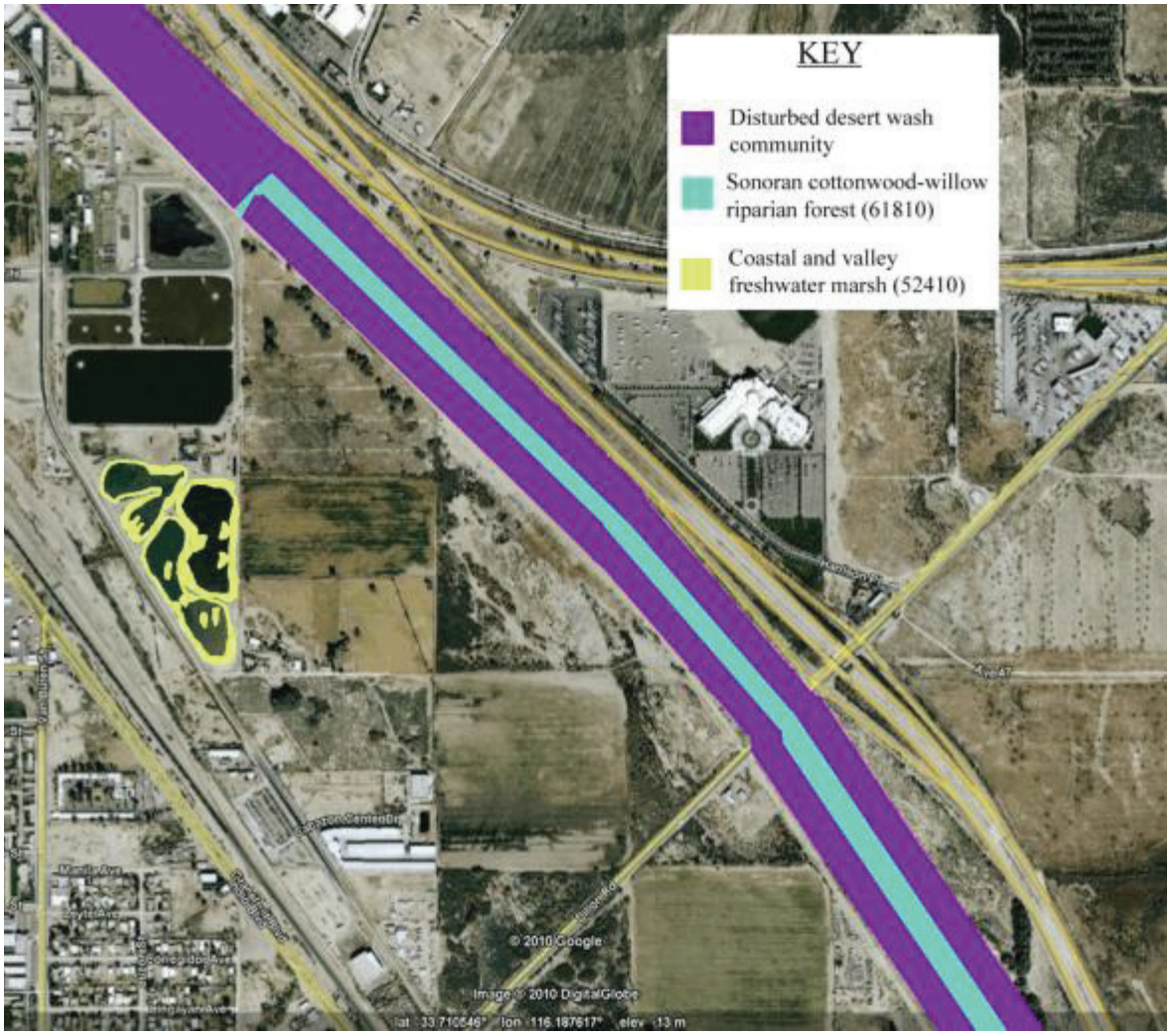


Figure 4. Habitat Map for the Channel and Pond Survey Areas



Tables

Table 1a. CNDDB database sensitive plant occurrences in the USGS – Indio, Myoma , W. Berdoo, and La Quinta quads.

Scientific Name	Common Name	Federal Status	State Status	CNPS list	General habitat	Micro-habitat	Status on site
Abronia villosa var. aurita	chaparral sand-verbena	N/A	N/A	1B	Chaparral, coastal scrub	Sandy areas. 80-1600m.	*A. villosa* was found but the variety could not be identified. This species typically inhabits dunes or sandy areas and was seen higher up on the channel sides. Any changes in water flow would not affect this species.
Antirrhinum cyathiferum	Deep Canyon snapdragon	N/A	N/A	2	Sonoran desert scrub. In california, known only from riverside county.	Rocky sites. 0-800m.	There was appropriate habitat but no *Antirrhinum,* or any native species in the Scrophulariaceae plant family, species were found.
Astragalus lentiginosus var. coachellae	Coachella Valley milk-vetch	Endangered	N/A	1B	Sonoran desert scrub. Endemic to the coachella valley, riverside county.	Sandy flats, washes, outwash fans, sometimes on dunes. 60-360m.	There was appropriate habitat but no *Astragalus* species were found.
Astragalus tricarinatus	triple-ribbed milk-vetch	endangered	N/A	1B	Joshua tree woodland, sonoran desert scrub. Known only from riverside and san bernardino counties.	Hot, rocky slopes in canyons and along edge of boulder-strewn desert washes, w/larrea and encelia. 450-790m.	There was no appropriate habitat and no *Astragalus* species were found.
Ayenia compacta	ayenia	N/A	N/A	2	Mojave desert scrub, sonoran desert scrub.	Sandy and gravelly washes in the desert, dry desert cyns. 150-1095m.	There was appropriate habitat but no *Ayenia compacta* were found.

Scientific Name	Common Name	Federal Status	State Status	CNPS list	General habitat	Micro-habitat	Status on site
Chamaesyce arizonica	Arizona spurge	N/A	N/A	2	Sonoran desert scrub	Sandy soils. 50-300m.	There was appropriate habitat but no *Chamasyces* species were found.
Chamaesyce platysperma	flat-seeded spurge	N/A	N/A	1B	Sonoran desert scrub, desert dunes.	Sandy places or shifting dunes. Possibly a waif in california; more common in arizona and mexico. 60-950m.	There was appropriate habitat but no *Chamasyces* species were found.
Ditaxis claryana	glandular ditaxis	N/A	N/A	2	Mojavean desert scrub, sonoran desert scrub.	In dry washes and on rocky hillsides. Sandy soils. 0-465m.	There was appropriate habitat but no *Ditaxis* species were found.
Ditaxis serrata var. californica	California ditaxis	N/A	N/A	3	Sonoran desert scrub. Known only from riverside and san diego counties.	On sandy washes and alluvial fans of the foothills and lower desert slopes. 30-1000m.	There was appropriate habitat but no *Ditaxis* species were found.
Leptosiphon floribundus ssp. hallii	Santa Rosa Mountains leptosiphon	N/A	N/A	1B	Sonoran desert scrub. Known only from riverside and san diego counties.	Desert canyons. 900-1275m.	There was no appropriate habitat and no *Leptosiphon* species were found.

Scientific Name	Common Name	Federal Status	State Status	CNPS list	General habitat	Micro-habitat	Status on site
Linanthus maculatus	Little San Bernardino Mtns. linanthus	N/A	N/A	1B	Desert dunes, sonoran desert scrub, mojave desert scrub, joshua tree woodland. Only known from riv and sbd counties.	Sandy places; microhab difficult to pin down. Usu. In light-colored quartz sand; often in wash or bajada. 195-2075m.	There was appropriate habitat but no *Linanthus* species were found.
Mentzelia tridentata	creamy blazing star	N/A	N/A	1B	Mohave desert scrub.	700-1160m.	There was appropriate habitat but no *Mentzelia* species were found.
Nemacaulis denudata var. gracilis	slender woolly-heads	N/A	N/A	2	Coastal dunes, desert dunes, sonoran desert scrub. In california, known only from san diego and riverside counties.	In dunes or sand. 0-560m.	There was appropriate habitat but no *Nemacaulis* species were found.
Phaseolus filiformis	slender-stem bean	N/A	N/A	2	Sonoran desert scrub. In california, known only from riverside county.	Gravelly washes bordered by creosote bush-dominated rocky slopes. One site in california: 125m.	No appropriate habitat on site, *P. filiformis* was not found.
Selaginella eremophila	desert spike-moss	N/A	N/A	2	Sonoran desert scrub.	Shaded sites, gravelly soils; crevices or among rocks. 300-2425m.	No appropriate habitat on site, no *Selaginella spp.* were not found.

Scientific Name	Common Name	Federal Status	State Status	CNPS list	General habitat	Micro-habitat	Status on site
Senna covesii	Coves's cassia	N/A	N/A	2	Sonoran desert scrub.	Dry, sandy desert washes, slopes. 200-1070m.	There was appropriate habitat but no *Senn sp.*species were found.
Stemodia durantifolia	purple stemodia	N/A	N/A	2	Sonoran desert scrub.	Sandy soils; mesic sites. 180-300m.	There was appropriate habitat but no *Antirrhinum,* or any native species in the Scrophulariaceae plant family, species were found.
Xylorhiza cognata	Mecca-aster	N/A	N/A	1B	Sonoran desert scrub. Endemic to riverside county.	Steep canyon slopes, in sandstone and clay. 20-305m.	No appropriate habitat on site, *X. cognata* was not found.

Table 1b. CNDDB database sensitive animal occurrences in the USGS – Indio, Myoma , W. Berdoo, and La Quinta quads.

Scientific Name	Common Name	Status Fed/State	CDFG status	General Habitat	Micro-Habitat	Status On site
Athene cunicularia	burrowing owl	None/None	SC	Open, dry annual or perenial grasslands, deserts & scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the california ground squirrel.	Species found on outer bank of south levee of Channel. Suitable habitat along pipeline routes where the is open land.
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	None/None	SC	Coastal scrub, chaparral, grasslands, sagebrush, etc. In western san diego co.	Sandy, herbaceous areas, usually in association with rocks or coarse gravel.	Suitable habitat along pipeline routes where there is open land.
Chaetodipus fallax pallidus	pallid San Diego pocket mouse	None/None	SC	Desert border areas in eastern san diego co. In desert wash, desert scrub, desert succulent scrub, pinyon-juniper, etc.	Sandy herbaceous areas, usually in association with rocks or coarse gravel.	Suitable habitat along pipeline routes where there is open land.
Crotalus ruber	red-diamond rattlesnake	None/None	SC	Chaparrral, woodland, grassland, & desert areas from coastal san diego county to the eastern slopes of the mountains.	Occurs in rocky areas & dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	No suitable habitat exists within the project area.

Scientific Name	Common Name	Status Fed/State	CDFG status	General Habitat	Micro-Habitat	Status On site
Cyprinodon macularius	desert pupfish	E/E		Desert ponds, springs, marshes and streams in southern california.	Can live in salinities from fresh water to 68 ppt, can withstand temps from 9 - 45 c & dissolved oxygen levels down to 0	No suitable habitat exists within the project area.
Dinacoma caseyi	Casey's June beetle	None/None		Found only in two populations in a small area of southern palm springs.	Found in sandy soils; the females live underground and only come to the ground surface to mate.	Out of species range. No suitable habitat exists within the project area.
Dipodomys merriami collinus	Earthquake Merriam's kangaroo rat	Prop E/ None		Known only from san diego & riverside co. Associated with riversidean sage scrub, chaparral, & non-native grassland.	Need sandy loam substrates for digging of burrows.	Out of species range. No suitable habitat exists within the project area.
Eumops perotis californicus	western mastiff bat	None/None	SC	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral etc	Roosts in crevices in cliff faces, high buildings, trees & tunnels.	Occurrence potential is channel is moderate.
Falco mexicanus	prairie falcon	None/None		Inhabits dry, open terrain, either level or hilly.	Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	No suitable nesting habitat within project area

Scientific Name	Common Name	Status Fed/State	CDFG status	General Habitat	Micro-Habitat	Status On site
Gopherus agassizii	desert tortoise	None/None		Most common in desert scrub, desert wash, and joshua tree habitats; occurs in almost every desert habitat.	Require friable soil for burrow and nest construction. Creosote bush habitat with lg annual wildflower blooms preferred.	No suitable habitat within project area.
Lasiurus xanthinus	western yellow bat	None/None	SC	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats.	Roosts in trees, particularly palms. Forages over water and among trees.	Occurrence potential is channel is moderate.
Macrobaenetes valgum	Coachella giant sand treader cricket	None/None		Known from the sand dune ridges in the vicinity of coachella valley.	Population size regulated by amount of annual rainfall; some spots favor permanent habitation where springs dampen sand.	No sand dune habitat within the project area. Occurrence potential is low.
Neotoma lepida intermedia	San Diego desert woodrat	None/None	SC	Coastal scrub of southern california from san diego county to san luis obispo county.	Moderate to dense canopies preferred. They are particularly abundant in rock outcrops & rocky cliffs & slopes.	Occurrence potential is channel is moderate.

Scientific Name	Common Name	Status Fed/State	CDFG status	General Habitat	Micro-Habitat	Status On site
Nyctinomops femorosaccus	pocketed free-tailed bat	None/None	SC	Variety of arid areas in southern california; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert ripa	Rocky areas with high cliffs.	Occurrence potential is channel is moderate.
Oliarces clara	cheeseweed owlfly (cheeseweed moth lacewing)	None/None		Inhabits the lower colorado river drainage.	Found under rocks or in flight over streams. Larrea tridentata is the suspected larval host.	Out of species range.
Ovis canadensis nelsoni	Nelson's bighorn sheep	None/None		Widely distributed from the white mtns in mono co. To the chocolate mts in imperial co.	Open, rocky, steep areas with available water and herbaceous forage.	Out of species current range.
Perognathus longimembris bangsi	Palm Springs pocket mouse	None/None	SC	Desert riparian, desert scrub, desert wash & sagebrush habitats. Most common in cresote-dominated desert scrub.	Rarely found on rocky sites. Occurs in all canopy coverage classes.	Suitable habitat along pipeline routes where there is open land.

Scientific Name	Common Name	Status Fed/State	CDFG status	General Habitat	Micro-Habitat	Status On site
Phrynosoma mcallii	flat-tailed horned lizard	None/None	SC	Restricted to desert washes and desert flats in central riverside, eastern san diego, and imperial counties.	Critical habitat element is fine sand, into which lizards burrow to avoid temp extremes; requires vegetative cover and a	Suitable habitat along pipeline routes where there is open land.
Polioptila melanura	black-tailed gnatcatcher	None/None		Primarily inhabits wooded desert wash habitats; also occurs in desert scrub habitat, especially in winter.	Nests in desert washes containing mesquite, paloverde, ironwood, acacia; absent from areas where salt cedar introduced.	Species not documented in project area and not observed during survey. Occurrence potential in channel is moderate.
Pyrocephalus rubinus	vermilion flycatcher	None/None	SC	During nesting, inhabits desert riparian adjacent to irrigated fields, irrigation ditches, pastures, & other open, mesic	Nest in cottonwood, willow, mesquite, and other large desert riparian trees.	Species not documented in project area and not observed during survey. Occurrence potential in channel is moderate.
Taxidea taxus	American badger	None/None	SC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils & open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Suitable habitat along pipeline routes where there is open land.

Scientific Name	Common Name	Status Fed/State	CDFG status	General Habitat	Micro-Habitat	Status On site
Toxostoma crissale	Crissal thrasher	None/None	SC	Resident of southeastern deserts in desert riparian and desert wash habitats.	Nests in dense vegetation along streams/washes; mesquite, screwbean mesquite, ironwood, catclaw, acacia, arrowweed, will	Suitable habitat along channel and pipeline routes where there is open land. Occurrence potential is moderate.
Toxostoma lecontei	Le Conte's thrasher	None/None	SC	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats.	Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	Suitable habitat along channel and pipeline routes where there is open land. Occurrence potential is moderate.
Uma inornata	Coachella Valley fringe-toed lizard	T/E		Limited to sandy areas in the coachella valley, riverside county.	Requires fine, loose, windblown sand (for burrowing), interspersed with hardpan and widely spaced desert shrubs.	Marginal habitat along pipeline routes where there is open land near the stable sand field. Species not documented in project area. Occurrence potential is low.
Xerospermophilus tereticaudus chlorus	Palm Springs round-tailed ground squirrel	C/None	SC	Restricted to the coachella valley. Prefers desert succulent scrub, desert wash, desert scrub, alkali scrub, & levees.	Prefers open, flat, grassy areas in fine-textured, sandy soil. Density correlated with winter rainfall.	Suitable habitat along channel and pipeline routes where there is open land. Species not documented in project area. Occurrence potential is low.

Coding and Terms

E= Endangered T= Threatened SC= Species of Concern N= None

R= Rare C= Candidate PE= Proposed Endangered N / A = Not Applicable

Federal Species of Concern: "taxa for which the U.S. Fish and Wildlife Service has information that indicates proposing to list the taxa as endangered or threatened is possibly appropriate, but for which substantial data on the biological vulnerability and threats are not currently known or on file to support the immediate preparation of rules." (Arnold). All of these species have a limited range.

State Species of Special Concern: An administrative designation given to vertebrate species that appear to be vulnerable to extinction because of declining populations, limited acreages, and/or continuing threats. Raptor and owls are protected under section 3502.5 of the California Fish and Game code: "It is unlawful to take, posses or destroy any birds in the orders Falconiformes or Strigiformes or to take, possess or destroy the nest or eggs of any such bird."

State Plant Rankings:
S1 - less than 6 element occurrences, or less than 1,000 individuals, or less than 2,000 acres
S2 - 6 to 20 element occurrences, or between 1,000 and 3,000 individuals, or between 2,000 and 10,000 acres
S3 - 21 to 100 element occurrences, or between 3,000 and 10,000 individuals, or between 10,000 and 50,000 acres
S4 - No Threat Rank
S5 - No Threat Rank

.1 - very threatened SH - all sites in California are historical
.2 - threatened
.3 - no current threats known

CNPS Plant Rankings:
1A- presumed extinct in California
1B - Rare, Threatened or Endangered in California and elsewhere
2 - Rare, Threatened or Endangered in California but more common elsewhere
3 - Plants for which more information is needed
4 - Plants with a limited distribution

Table 2. Plants Observed (asterisk indicates non-native, dagger indicates non-wetland/riparian species)

Family	Scientific Name
Asteraceae	† *Ambrosia acanthicarpa*
Asteraceae	† *Chaenactis fremontii*
Asteraceae	*† *Conyza bonariensis*
Asteraceae	† *Geraea canescens*
Asteraceae	*Helianthus annuus*
Asteraceae	*† *Lactuca serriola*
Asteraceae	† *Palafoxia arida*
Asteraceae	† *Pluchea sericea*
Asteraceae	* *Sonchus asper*
Asteraceae	*Xanthium strumarium*
Boraginaceae	† *Cryptantha angustifolia*
Boraginaceae	*Heliotropium curassavicum*
Brassicaceae	*† *Brassica tournefortii*
Brassicaceae	* *Coronopus didymus*
Brassicaceae	*† *Sisymbrium irio*
Chenopodiaceae	*† *Atriplex suberecta*
Chenopodiaceae	* *Chenopodium album*
Chenopodiaceae	* *Chenopodium murale*
Chenopodiaceae	*† *Salsola kali*
Chenopodiaceae	*† *Salsola tragus*
Chenopodiaceae	† *Suaeda moquinii*
Cyperaceae	*Bolboschoenus (Scirpus) maritimus*
Cyperaceae	*Cyperus odoratus*
Euphorbiaceae	† *Croton californicus*
Fabaceae	*† *Melilotus spp*
Geraniaceae	*† *Erodium cicutarium*
Hydrophyllaceae	*Emmenanthe penduliflora*
Nyctaginaceae	# *Abronia villosa*
Onagraceae	† *Camissonia californica*
Onagraceae	† *Camissonia claviformis*
Poaceae	* *Arundo donax*
Poaceae	*Leptochloa uninervia*
Poaceae	*Phragmites australis*
Poaceae	*† *Schismus barbatus*
Polygonaceae	*Polygonum hydropiperoides*
Polygonaceae	*Polygonum lapathifolium*
Portulaceae	* *Portulaca oleracea*
Salicaceae	*Populus fremontii ssp. Fremontii*
Salicaceae	*Salix gooddingii*
Scrophulariaceae	* *Veronica anagallis-aquatica*
Tamaricaceae	* *Tamarix ramosissima*
Zygophyllaceae	*† *Tribulus terrestris*

Table 3. Birds Observed

Podicipedidae	**Grebes**
Podilymbus podiceps	pie-billed grebe
Ardeidae	**Egrets, Herons & Bitterns**
Nycticorax nycticorax	black-crowned night heron
Butorides virescens	green heron
Ardea herodias	great blue heron
Egretta thula	snowy egret
Anatidae	**Swans, Geese & Ducks**
Anas platyrhynchos	mallard
Oxyura jaicensis	ruddy duck
Branta canadensis	Canada goose
Recurvirostridae	**Avocets and Stilts**
Himantopus mexicanus	black-necked stilt
Rallidae	**Rails and Coots**
Fulica ericana	American Coot
Gallinula chloropus	common moorhen
Rallus limicola	Virginia rail
Accipitridae	**Kites, Hawks, Eagles & Vultures**
Accipiter cooperii	Cooper's hawk
Buteo jaicensis	red-tailed hawk
Buteo lineatus	red-shouldered hawk
Falconidae	**Falcons**
Falco sparverius	American kestrel
Phasianidae	**Pheasants, Partridges & Quail**
Callipepla californica	California quail
Scolopacidae	**Sandpipers**
Actitis macularia	spotted sandpiper.
Calidris mauri	western sandpiper
Charadriidae	**Plovers**
Charadrius vociferus	killdeer
Columbidae	**Pigeons & Doves**
Zenaida macroura	mourning dove
Cuculidae	**Cuckoos and their Allies**
Geococcyx californianus	greater roadrunner
Tytonidae	**Barn Owls**
Tyto alba	barn owl

Trochilidae	**Hummingbirds**
Archilochus alexandri	black-chinned hummingbird
Calypte anna	Anna's hummingbird
Calypte costae	Costa's hummingbird
Tyrannidae	**Tyrant Flycatchers**
Contopus sordidulus	western wood-peewee
Empidonax difficilis	Pacific slope flycatcher
Tyrannus verticalis	western kingbird
Tyrannus vociferans	Cassin's kingbird
Myiarchus cinerascens	ash-throated flycatcher
Myiarchus tyrannulus	brown-crested flycatcher
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Hirundinidae	**Swallows**
Hirundo pyrrhonota	cliff swallow
Hirundo rustica	barn swallow
Stelgidopteryx serripennis	northern rough-winged swallow
Caprimulgidae	**Nightjars**
Chordeiles acutipennis	lesser nighthawk
Corvidae	**Crows, Jays**
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Aegithalidae	**Bushtit**
Psaltriparus minimus	common bushtit
Sittidae	**Nuthatches**
Sitta carolinensis	white-breasted nuthatch
roglodytidae	**Wrens**
Troglodytes aedon	house wren
Thryomanes bewickii	Bewick's wren
Salpinctes obsoletus	rock wren
Sylviidae	**Gnatcatchers**
Polioptila caerulea	blue-gray gnatcatcher
Remizidae	**Verdins**
Auriparus flaviceps	verdin
Turdidae	**Thrushes**
Turdus migratorius	American robin
Sialia mexicana	western bluebird
Mimidae	**Mockingbirds & Thrashers**
Mimus polyglottos	northern mockingbird
Toxostoma crissale	California thrasher

Ptilogonatidae	**Silky-Flycatchers**
Phainopepla nitens	phainopepla
Sturnidae	**Starlings**
**Sturnus vulgaris*	European starling
Vireonidae	**Vireos**
Vireo gilvus	warbling vireo
Parulidae	**Wood Warblers**
Dendroica coronate	yellow-rumped warbler
Dendroica petechia	yellow warbler
Dendroica townsendi	Townsend's warbler
Geothlypis trichas	common yellowthroat
Oporornis tolmiei	MacGillivray's warbler
Wilsonia pusilla	Wilson's warbler
Vermivora celata	orange-crowned warbler
Vermivora ruficapilla	Nashville warbler
Icteria virens	yellow-breasted chat
Thraupidae	**Tanagers**
Piranga rubra	summer tanager
Piranga ludoviciana	western tanager
Cardinalidae	**Cardinals, Grosbeaks & Allies**
Pheucticus melanocephalus	black-headed grosbeak
Guiraca caerulea	blue grosbeak
Passerina ciris	lazuli bunting
Emberizidae	**Towhees, Sparrows & Longspurs**
Chondestes grmacus	lark sparrow
Melospiza melodia	song sparrow
Passerculus sandwichensis	savannah sparrow
Pipilo erythrophthalmus	spotted towhee
Pipilo crissalis	California towhee
Zonotrichia leucophrys	white-crowned sparrow
Icteridae	**Blackbirds & Orioles**
Agelaius phoeniceus	red-winged blackbird
Euphagus cyanocephalus	Brewer's blackbird
Icterus cucullatus	hooded oriole
Icterus galbula bullock	Bullock's oriole
Quiscalus mexicanus	great-tailed grackle
Molothrus ater	brown headed cowbird
Sturnella neglecta	western meadowlark
Fringillidae	**Old World Finches**
Carpodacus mexicanus	house finch
Carduelis psaltria	lesser goldfinch
Carduelis tristis	American goldfinch

Passeridae	**Old World Sparrows**
Passer domesticus	house sparrow

Photos

Photo 1. Sonoran cottonwood-willow riparian forest mid- frame with disturbed desert wash community on both sides.

Photo 2. Disturbed desert wash community upstream from the waste-water discharge.

Photo 3. View of Sonoran cottonwood-willow riparian forest w/ substantial Tamarix component.

Photo 4. View of Sonoran cottonwood-willow riparian forest w/ substantial willow component.

Photo 5. Abronia villosa found during survey.

Photo 6. Active Burrowing Owl Burrow on dry side of south levee.

Photo 7. Disturbance from flood control activities on both sides of the river. This activity stops short of the center of the river and the Sonoran cottonwood-willow riparian forest.

Photo 8. Coastal and valley freshwater marsh around filtration ponds.

Photo 9. View of waterfowl utilizing ponds.

Photo 10. Bird viewing tower.

Photo 11. Typical view of pipeline route surroundings along paved road.

Photo 12. Typical view of pipeline route surroundings along dirt road.

Photo 13. Example of open land with native habitat adjacent to pipeline route along Dillon Road.

Photo 14. Typical Site characteristics of proposed groundwater recharge location.

Avian Survey Data Sheets

IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES

INDIO WATER AUTHORITY
WASTEWATER TREATMENT PROJECT

Cities of Indio and La Quinta
Riverside County, California

For Submittal to:

Indio Water Authority
83-101 Avenue 45
Indio, CA 92201
and
United States Department of Agriculture
Rural Utilities Service
1400 Independence Avenue, SW
Washington, D.C. 20250

Prepared for:

Tom Dodson, President
Tom Dodson and Associates
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San Bernardino, CA 92405

Prepared by:

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1016 E. Cooley Drive, Suite A/B
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Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

October 26, 2010
Revised November 10, 2010
CRM TECH Contract No. 2451

NATIONAL ARCHAEOLOGICAL DATABASE INFORMATION

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Date: October 26, 2010; Revised November 10, 2010

Title: Identification and Evaluation of Historic Properties: Indio Water Authority Wastewater Treatment Project, Cities of Indio and La Quinta, Riverside County, California

For Submittal to: Indio Water Authority
83-101 Avenue 45
Indio, CA 92201
(760) 391-4038
and
United States Department of Agriculture
Rural Utilities Service
1400 Independence Avenue, SW
Washington, D.C. 20250
(202) 720-2791

Prepared for: Tom Dodson, President
Tom Dodson and Associates
2150 N. Arrowhead Avenue
San Bernardino, CA 92405
(909) 882-3612

USGS Quadrangle: Indio, Myoma, La Quinta, and West Berdoo Canyon, Calif., 7.5' quadrangles (T5S R7E, T5S R8E, and T6S R7E, San Bernardino Baseline and Meridian)

Project Size: Approximately 22 linear miles plus tertiary treatment system, groundwater recharge locations, and aquifer storage recovery wells

Keywords: Coachella Valley area, Riverside County; Phase I historical/ archaeological resources survey; Sites 33-005705 (Coachella Canal), 33-009498 (former Southern Pacific Railroad), and 33-017259 (Coachella Valley Stormwater Channel); no "historic properties" or "historical resources" affected

EXECUTIVE SUMMARY

Between May and November 2010, at the request of Tom Dodson and Associates, CRM TECH performed a cultural resources survey on the Area of Potential Effects (APE) for a proposed wastewater treatment facility project in the Cities of Indio and La Quinta, Riverside County, California. The undertaking, as proposed by the Indio Water Authority (IWA), involves primarily the installation of approximately 22 linear miles of alternative pipeline routes. In addition, it also includes the installation of a tertiary treatment system, one or more groundwater recharge treatment facilities, and new aquifer storage recovery (ASR) wells, or the conversion of existing wells to ASR functions.

The APE is delineated to encompass the maximum extent of ground disturbance required for the undertaking, including all of the alternative project routes and locations. The pipeline routes lie mostly within the existing rights-of-way of various public roadways extending generally from Dillon Road on the northeast to Adams Street on the west and Avenue 51 on the south. The tertiary treatment system will be installed at alternative locations within the existing Valley Sanitary District Wastewater Treatment Plant. The groundwater recharge treatment facilities will be constructed on one of several alterative sites, including Posse Park. The exact location and configuration of the new ASR wells, up to four in total, would be determined by the specific requirements of the geologic strata as well as the existence of and distance to production wells. The entire APE is located within T5S R7E, T5S R8E, and T6S R7E, San Bernardino Baseline and Meridian.

The study is a part of the environmental review process for the proposed undertaking. The lead agency for the undertaking, namely the IWA, required the study pursuant to the California Environmental Quality Act (CEQA). In anticipation of future project review by the Rural Utilities Service of the United States Department of Agriculture (USDA), the study was conducted in compliance with both CEQA and Section 106 of the National Historic Preservation Act. The purpose of the study is to provide the IWA and the USDA with the necessary information and analysis to determine whether the proposed undertaking would have an effect on any "historic properties," as defined by 36 CFR 800.16(l), or "historical resources," as defined by Title 14 CCR §15064.5(a)(1)-(3), that may exist in or near the APE.

In order to accomplish this objective, CRM TECH conducted a historical/archaeological resources records search, pursued historical background research, contacted Native American representatives, and carried out a systematic field survey. The results of the records search indicate that three previously identified cultural resources, Sites 33-005705 (Coachella Canal), 33-009498 (former Southern Pacific Railroad), and 33-017259 (Coachella Valley Stormwater Channel), are located partially within the APE. Upon further research, including the field inspection, it was ascertained that these sites remain present at their recorded locations.

Among these three sites, 33-005705, representing the Coachella Canal (also known as the Coachella Valley branch of the All-American Canal), was previously determined to qualify as a "historic property" and "historical resource." Under current regulatory guidelines, however, in most cases cultural resources studies for linear infrastructure projects that simply cross such irrigation canals may exclude them from the APE because there is

generally little potential for their overall historical characteristics and significance to be affected. In light of the nature of the undertaking in the vicinity of Site 33-005705, it was determined that this provision applies to the site.

Site 33-009498, the former Southern Pacific (now Union Pacific) Railroad, once played a crucial role in the development of the region and the state at large, but as a working component of the modern transportation infrastructure, it does not appear to meet the definition of a "historic property" or a "historical resource" due to the lack of sufficient historic integrity. Site 33-017259, the Coachella Valley Stormwater Channel, is based on the natural waterway of the Whitewater River with only limited human alterations, and does not demonstrate any notable design or engineering qualities. As another element of the historic-period infrastructure that remains in use today, it does not retain any distinctive historic characteristics, and does appear qualify as a "historic property" or a "historical resource."

No other potential "historic properties" or "historical resources" were encountered within or adjacent to the APE during this study. Based on these findings, and pursuant to 36 CFR 800.4(d)(1) and Calif. PRC §21084.1, CRM TECH recommends to the IWA and the USDA a conclusion that *no "historic properties" or "historical resources" will be affected by the proposed undertaking*. No further cultural resources investigation is recommended for the undertaking unless project plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are encountered during earth-moving operations, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

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INTRODUCTION

Between May and November 2010, at the request of Tom Dodson and Associates, CRM TECH performed a cultural resources survey on the Area of Potential Effects (APE) for a proposed wastewater treatment facility project in the Cities of Indio and La Quinta, Riverside County, California (Fig. 1). The undertaking, as proposed by the Indio Water Authority (IWA), involves primarily the installation of approximately 22 linear miles of alternative pipeline routes. In addition, it also includes the installation of a tertiary treatment system, one or more groundwater recharge treatment facilities, and new aquifer storage recovery (ASR) wells, or the conversion of existing wells to ASR functions.

The APE is delineated to encompass the maximum extent of ground disturbance required for the undertaking, including all of the alternative project routes and locations. The pipeline routes lie mostly within the existing rights-of-way of various public roadways extending generally from Dillon Road on the northeast to Adams Street on the west and Avenue 51 on the south. The tertiary treatment system will be installed at alternative locations within the existing Valley Sanitary District Wastewater Treatment Plant. The groundwater recharge treatment facilities will be constructed on one of several alterative sites, including Posse Park. The exact location and configuration of the new ASR wells, up to four in total, would be determined by the specific requirements of the geologic strata as well as the existence of and distance to production wells. The entire APE is located within T5S R7E, T5S R8E, and T6S R7E, San Bernardino Baseline and Meridian (Fig. 2).

The study is a part of the environmental review process for the proposed undertaking. The lead agency for the undertaking, namely the IWA, required the study pursuant to the

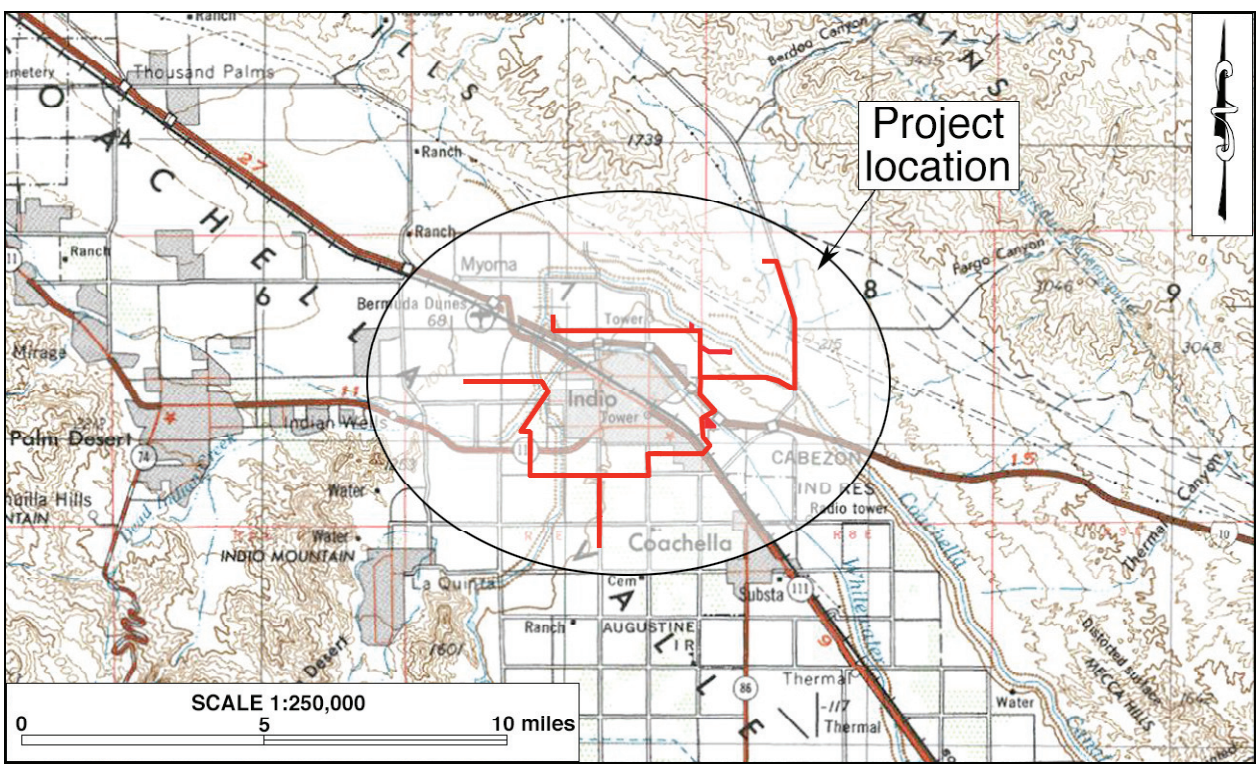

Figure 1. Project vicinity. (Based on USGS Santa Ana, Calif., 1:250,000 quadrangle [USGS 1979])

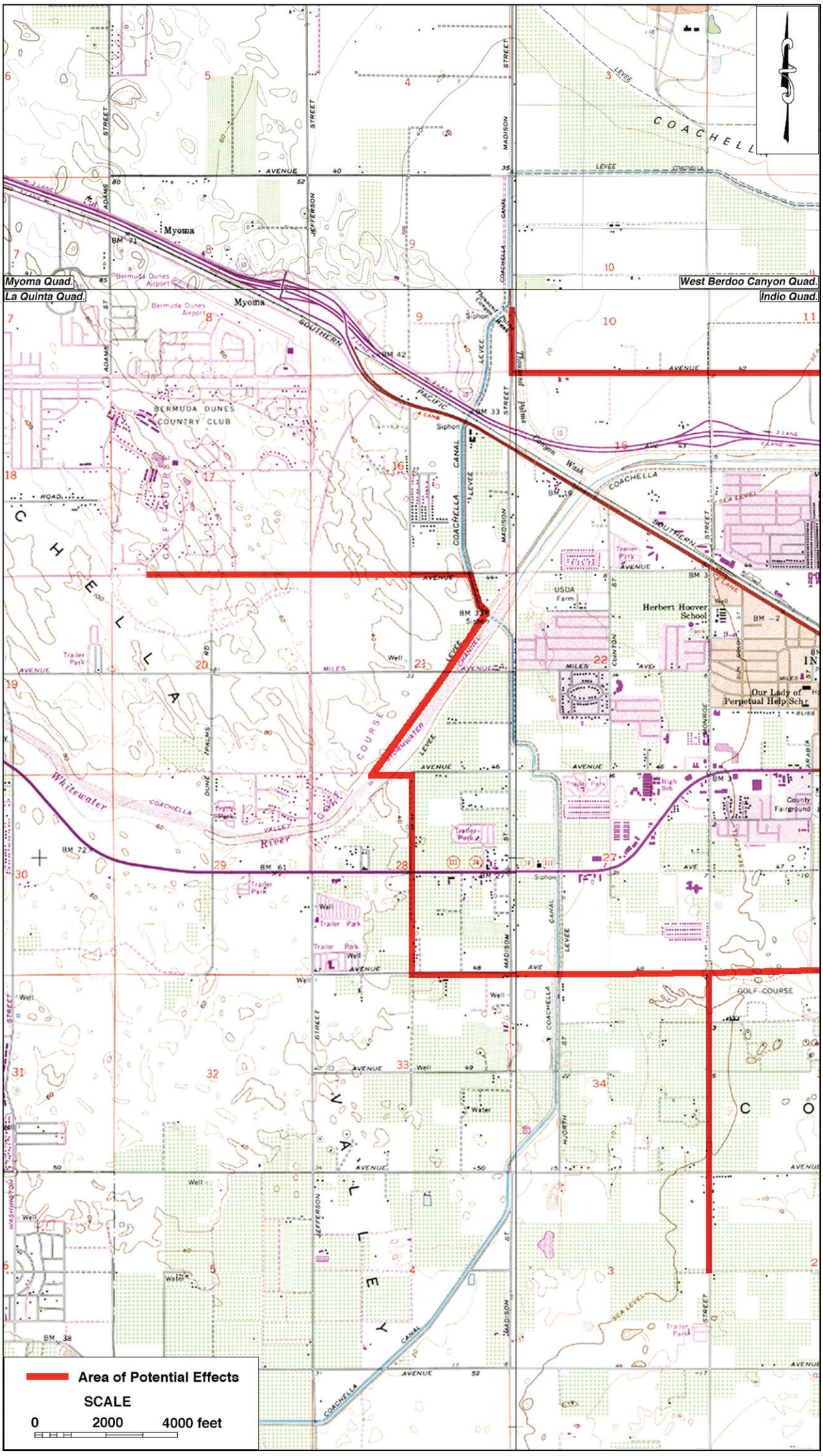

Figure 2a. Area of Potential Effects, western portion. (Based on USGS Indio, Myoma, La Quinta and West Berdoo Canyon, Calif., 1:24,000 quadrangles [USGS 1972; 1978; 1980; 1988])

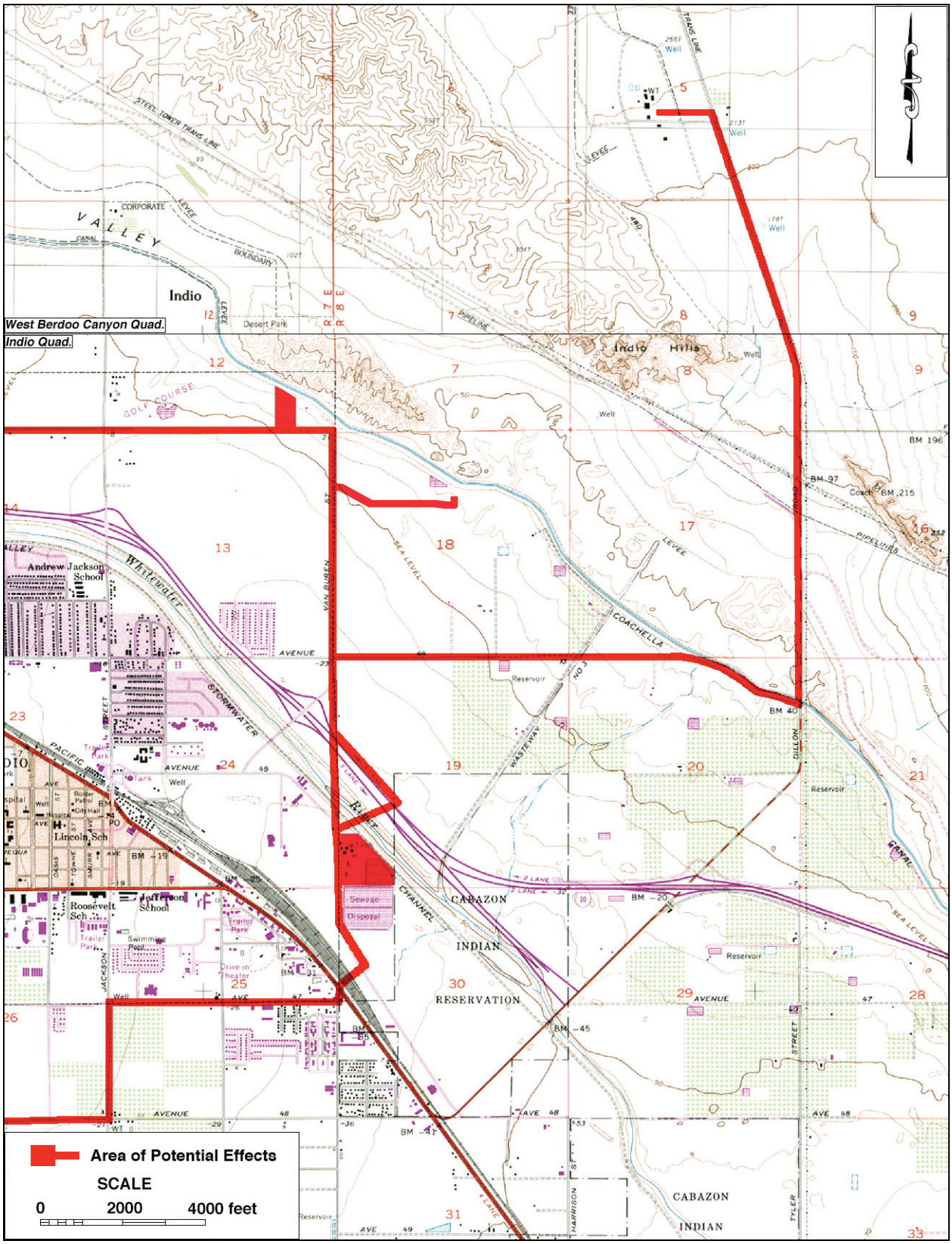

Figure 2b. Area of Potential Effects, eastern portion. (Based on USGS Indio and West Berdoo Canyon, Calif., 1:24,000 quadrangles [USGS 1972; 1988])

California Environmental Quality Act (CEQA). In anticipation of future project review by the Rural Utilities Service of the United States Department of Agriculture (USDA), the study was conducted in compliance with both CEQA and Section 106 of the National Historic Preservation Act. The purpose of the study is to provide the IWA and the USDA with the necessary information and analysis to determine whether the proposed undertaking would have an effect on any "historic properties," as defined by 36 CFR 800.16(l), or "historical resources," as defined by Title 14 CCR §15064.5(a)(1)-(3), that may exist in or near the APE. The following report is a complete account of the methods and results of the various avenues of research, and the final conclusion of the study.

SETTING

CURRENT NATURAL SETTING

The Cities of Indio and La Quinta are situated in the heart of the Coachella Valley, a northwest-southeast trending desert valley that constitutes the western end of the Colorado Desert. Dictated by this geographic setting, the climate and environment of the region are typical of southern California's desert country, marked by extremes in temperature and aridity. Temperatures often reach over 120 degrees in summer, and dip to near freezing in winter. Average annual precipitation is less than five inches, and the average annual evaporation rate exceeds three feet.

The APE is located in a fully developed urban/suburban setting, and the existing land use along the pipeline route includes retail businesses and residential neighborhoods. Most of the APE lies within the pavement of existing roads and parking lots, although a few undeveloped fields and a dirt access road are also present along the project route (Fig. 3). Vegetation observed in and around the APE consists mostly of introduced landscaping plants, but also includes foxtails, saltbushes, tumbleweeds, and the typical small desert shrubs and grasses.

In centuries past, native lifeways in the Coachella Valley was greatly influenced by the appearance and disappearance of Holocene Lake Cahuilla, which began its final desiccation around AD 1650. The APE lies directly across the shoreline of the lake during its last high stand, which ran roughly along the present-day 42-foot contour line. Its proximity to this now-vanished freshwater lake, and to the seasonal flow of the Whitewater River, renders the area around the APE a favorable setting for prehistoric Native American habitation.

CULTURAL SETTING

Ethnohistoric Context

The Coachella Valley is a historical center of Native American settlement, where U.S. surveyors noted large numbers of Indian villages and *rancherías*, occupied by the Cahuilla people, in the mid-19th century. The Cahuilla, a Takic-speaking people whose society was once based on hunting and gathering, are generally divided by anthropologists into three groups, according to their geographic setting: the Pass Cahuilla of the San Gorgonio Pass-Palm Springs area, the Mountain Cahuilla of the San Jacinto and Santa Rosa Mountains and

Figure 3. Typical landscapes in and near the project area. *Clockwise from upper left*: existing Valley Sanitary District Wastewater Treatment Plant; proposed groundwater recharge site; pipeline route across the Whitewater River (view to the east); pipeline route along Shields Road (view to the south).

the Cahuilla Valley, and the Desert Cahuilla of the eastern Coachella Valley. The basic written sources on Cahuilla culture and history include Kroeber (1925), Strong (1929), and Bean (1978). The following ethnohistoric discussion is based primarily on these sources.

The Cahuilla did not have a single name that referred to an all-inclusive tribal affiliation. Instead, membership was in terms of lineages or clans. Each lineage or clan belonged to one of two main divisions of the people, known as moieties. Members of clans in one moiety had to marry into clans from the other moiety. Individual clans had villages, or central places, and territories they called their own, for purposes of hunting game, gathering food, or utilizing other necessary resources. They interacted with other clans through trade, intermarriage, and ceremonies.

Population data prior to European contact are almost impossible to obtain, but estimates range from 3,600 to as high as 10,000 persons. During the 19th century, however, the Cahuilla population was decimated as a result of European diseases, most notably smallpox, for which the Native peoples had no immunity. Today, Native Americans of Pass or Desert Cahuilla heritage are mostly affiliated with one or more of the Indian reservations in and near the Coachella Valley, including Cabazon, Torres Martinez, Augustine, Agua Caliente, and Morongo.

Historic Context

In 1823-1825, José Romero, José Maria Estudillo, and Romualdo Pacheco became the first noted European explorers to travel through the Coachella Valley when they led a series of expeditions in search of a route to Yuma (Johnston 1980:92-95). Due to its harsh environment, few non-Indians ventured into the desert valley during the Mexican and early American periods, except those who traveling along the established trails.

The most important of these trails was the Cocomaricopa Trail, an ancient Indian trading route that was "discovered" in 1862 by William David Bradshaw and known after that as the Bradshaw Trail (Gunther 1984:71; Ross 1991:25). In much of the Coachella Valley, this historic wagon road traversed a similar course to that of present-day Highway 111. During the 1860s-1870s, the Bradshaw Trail served as the main thoroughfare between coastal southern California and the Colorado River, until the completion of the Southern Pacific Railroad in 1876-1877 brought an end to its heyday (Johnston 1987:185).

Non-Indian settlement in the Coachella Valley began in the 1870s with the establishment of railroad stations along the Southern Pacific Railroad, and spread further in the 1880s after public land was opened for claims under the Homestead Act, the Desert Land Act, and other federal land laws (Laflin 1998:35-36; Robinson 1948:169-171). Farming became the dominant economic activity in the valley thanks to the development of underground water sources, often in the form of artesian wells.

Around the turn of the century, the date palm was introduced into the Coachella Valley, and by the late 1910s dates were the main agricultural crop and the tree an iconic image celebrating the region as the "Arabia of America" (Shields Date Gardens 1957). Then, starting in the 1920s, a new industry featuring equestrian camps, resorts, hotels, and eventually country clubs began to spread throughout the Coachella Valley, transforming it into southern California's premier winter retreat.

The City of Indio has its roots in the Southern Pacific Railroad station of Indian Wells, which was renamed Indio in 1877 to avoid confusion with another station on the same line. The townsite for Indio was officially laid out in 1888 on a portion of Section 23, T5S R7E, which the U.S. government had previously granted to the Southern Pacific Railroad Company. When the County of Riverside was created in 1893, Indio was designated one of the new county's 12 judicial townships and 40 election precincts. Long known as a railroad town, Indio was dominated by the Southern Pacific and its operations in almost every aspect of life until the 1960s. In 1930, Indio became the first incorporated city in the Coachella Valley.

In what is now the City of La Quinta, the earliest settlement and land development activities did not occur until the turn of the century. In 1926, with the construction of the La Quinta Hotel, the development of La Quinta took on the character of a winter resort, typical of the desert communities along Highway 111. Beginning in the early 1930s, the subdivision of the cove area of La Quinta and the marketing of "weekend homes" further emphasized this new direction of development. On May 1, 1982, La Quinta was incorporated as the 19th city in Riverside County.

RESEARCH METHODS

RECORDS SEARCH

On June 3, 2010, CRM TECH archaeologist Nina Gallardo (see App. 1 for qualifications) completed the records search at the Eastern Information Center (EIC), located at the University of California, Riverside. The EIC is the State of California's official cultural resource records repository for the County of Riverside, and a part of the California Historical Resource Information System, established and maintained under the auspices of the Office of Historic Preservation.

During the records search, Gallardo examined maps and records on file at the EIC for previously identified cultural resources within or near the APE, and existing cultural resources reports pertaining to the project vicinity. Previously identified cultural resources include properties designated as California Historical Landmarks, Points of Historical Interest, or Riverside County Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

HISTORICAL BACKGROUND RESEARCH

Bai "Tom" Tang, CRM TECH historian (see App. 1 for qualifications), conducted the historical background research on the basis of published literature in local history and historic maps of the Coachella Valley. Among maps consulted for this study were the U.S. General Land Office's (GLO) land survey plat maps dated 1856-1914 and the U.S. Geological Survey's (USGS) topographic maps dated 1904-1959. These maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, located in Moreno Valley.

NATIVE AMERICAN PARTICIPATION

On May 21, 2010, CRM TECH submitted a written request to the State of California's Native American Heritage Commission for a records search in the commission's sacred lands file. Following the commission's recommendations, CRM TECH contacted a total of 19 Native American representatives in the region both in writing and by telephone between June 11 and August 19 to solicit local Native American input regarding any possible cultural resources concerns over the proposed undertaking. The correspondences between CRM TECH and the Native American representatives are attached to this report in Appendix 2

FIELD SURVEY

CRM TECH archaeologist Daniel Ballester (see App. 1 for qualifications) carried out the field survey of the APE on June 10 and November 9, 2010. In light of its extensively disturbed state and, consequently, reduced archaeological sensitivity, most of the APE was surveyed at a reconnaissance level by driving along the project route and visually inspecting the surrounding ground surface for any indications of potential cultural resources. In the few small areas where the APE lies across open land, the survey was conducted on foot at an intensive level by walking parallel transects on either side of the

project centerline. This occurred mainly along the Whitewater River channel, across vacant parcels on Avenue 42 and Landmark Golf Parkway, and at the proposed tertiary filtration system sites.

Using these methods, the entire APE was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic periods (i.e., 50 years or older). Since most of the APE lies within paved roads and parking lots, visibility of native ground surface was generally poor (0%), but was good (85%) in the areas where no pavement was present.

RESULTS AND FINDINGS

PREVIOUS CULTURAL RESOURCES STUDIES IN THE VICINITY

According to EIC records, a large portion of the APE may have been covered by as many as 20 previous cultural resources studies completed between 1977 and 2007, but the APE as a whole had not been surveyed systematically prior to this study (Figs. 4a, 4b). Outside the APE but within a one-mile radius, EIC records show more than 250 other studies on various tracts of land and linear features (Figs. 4a, 4b), attesting to the large number of development projects in the project vicinity in recent decades.

As a result of these studies, at least 335 historical/archaeological sites, historic-period buildings, and isolates—i.e., localities with fewer than three artifacts—have been identified within the scope of the records search. More than 150 of the sites were prehistoric—i.e., Native American—in nature, recorded predominantly as multi-use sites with associated artifacts such ceramic sherds, lithic flakes, fire-affected rock, and groundstone implements. The historic-period sites in the vicinity consisted primarily of refuse deposits, while the historic-period buildings were mostly residences constructed in the early and mid-20th century.

Among the 150 or so prehistoric archaeological resources were a number of large habitation sites that were considered significant for the study of local prehistory. It is worth noting that the westernmost portion of the APE lies across one of the densest concentrations of prehistoric archaeological sites to be found in Riverside County, a direct reflection of the location of that area along the former shoreline of Holocene Lake Cahuilla and along the Whitewater River. The vast majority of those sites, however, have evidently been removed after proper archaeological treatment, including subsurface testing and mitigative excavations.

Twenty-one of the previously recorded cultural resources were known to be located partially within, adjacent to, or in close proximity to the APE, as listed below in Table 1. The three sites lying partially within the APE were all linear features from the historic period, namely the Coachella Canal (33-005705), the former Southern Pacific (now Union Pacific) Railroad (33-009498), and the Coachella Valley Stormwater Channel (33-017259). Among them, the Coachella Canal was previously determined to be eligible for listing in the National Register of Historic Places (Schaefer et al. 2003:5.5-5.6), while the Coachella Valley Stormwater Channel was determined not to be eligible for the California Register of Historical Resources (Tang and Quinn 2008:5).

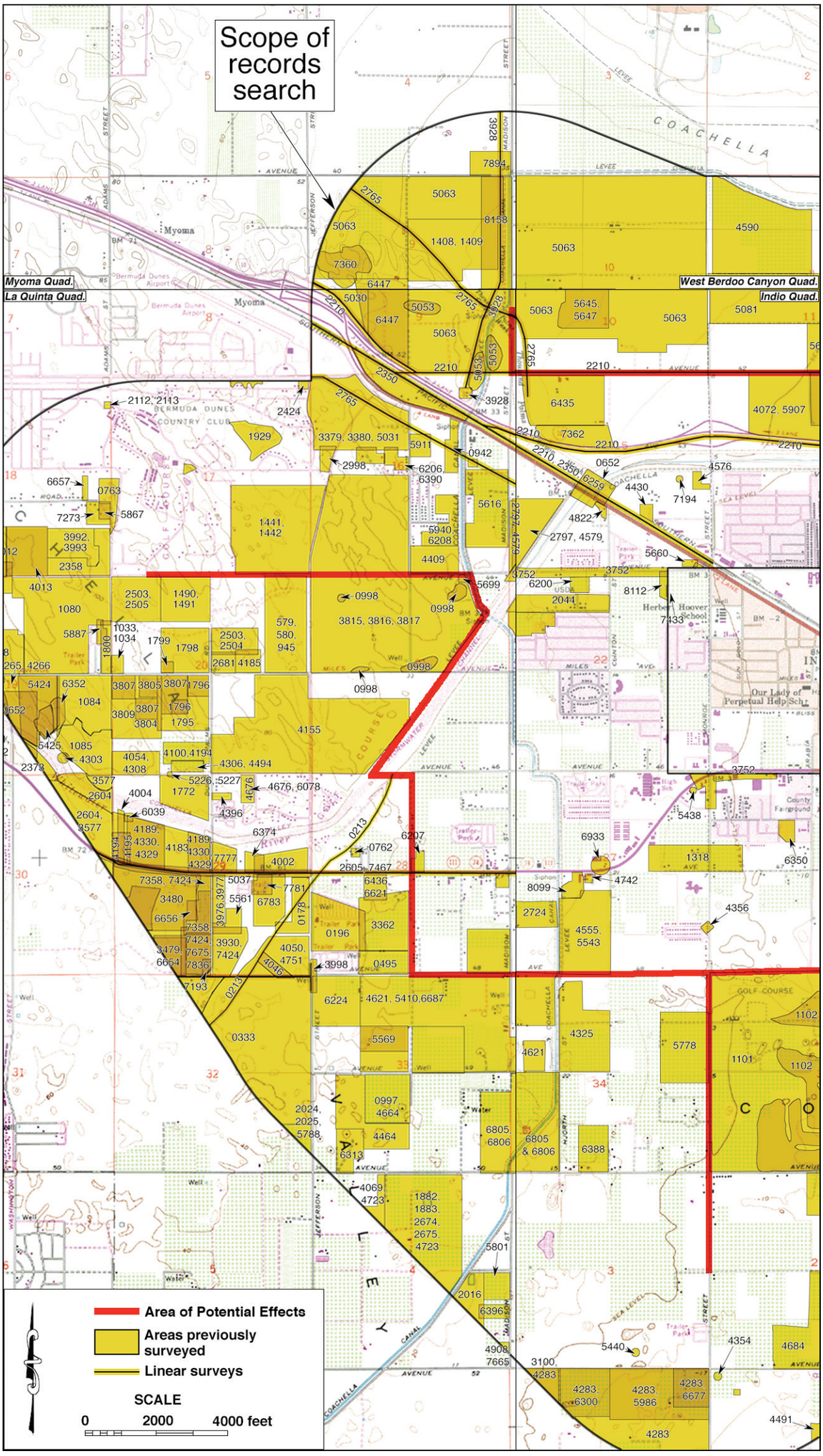

Figure 4a. Previous cultural resources studies in the vicinity of the APE (western portion), listed by EIC file number. Locations of historical/archaeological sites are not shown as a protective measure.

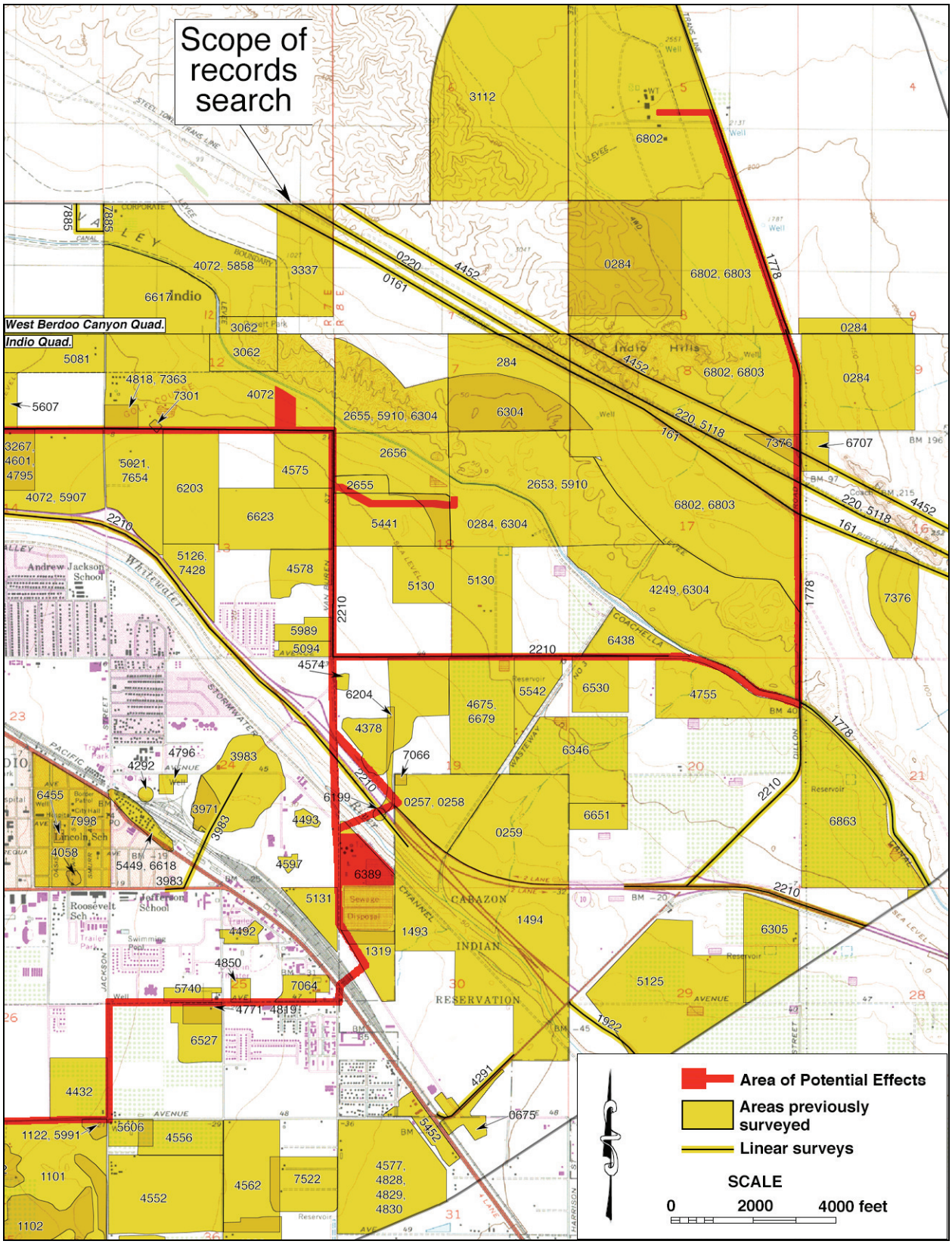

Figure 4b. Previous cultural resources studies in the vicinity of the APE (eastern portion).

Table 1. Previously Recorded Cultural Resources within or adjacent to the APE		
Site No.	**Recorded by/Date**	**Description**
33-000159	Various 1960-1993	Prehistoric habitation site; destroyed by construction
33-001540	Townsend 1976	Prehistoric camp site with ceramics and bone
33-001769	Desautels 1982	Small prehistoric ceramic scatter
33-005330	Love and Moffit 1994	Large prehistoric ceramic scatter
33-005331	Love and Moffit 1994	Prehistoric ceramic sherds, lithics, and groundstone
33-005354	Love and Moffit 1994	Historic-period agricultural complex
33-005705*	Foulkes 1983	Coachella Canal
33-007425	Collins 1995	Prehistoric habitation site with historic-period refuse
33-008142	Love 1997	Prehistoric ceramic and lithic scatter; removed
33-008144	Love 1997	Prehistoric ceramic scatter; removed
33-008729	Alexandrowicz and Krautkramer 1999	Prehistoric habitation site
33-008741	Alexandrowicz and Krautkramer 1999	Prehistoric lithic and ceramic scatter
33-009498*	Ashkar 1999; Taniguchi 2005	Former Southern Pacific (now Union Pacific) Railroad
33-010993	Harm 2000	Concrete wall
33-011114	Ballester 2001	Prehistoric ceramic and lithic scatter with fire-affected rock and groundstone artifacts
33-011116	Ballester 2001	Prehistoric ceramic scatter with fire-affected rock
33-011414	Ballester 2002	Prehistoric ceramic scatter with one lithic flake
33-012298	Smith et al. 1999	Prehistoric ceramic scatter with fire-affected rock and bone awl tip
33-013528	O'Neil and Brown 2004	Bedrock milling feature
33-017259*	Ballester 2008	Coachella Valley Stormwater Channel
33-017933	Jacquemain and Ballester 2009	Fred Young Farm Labor Center, ca. 1966

* Recorded partially within the APE.

Of the 18 cultural resources recorded adjacent or in close proximity to the APE, 15 dated to the prehistoric period, including habitation sites and ceramic scatters, and the other three dated to the historic period, including an agricultural complex and a 1960s farm labor center (Table 1). Most of the archaeological sites, like the majority of the rest within the scope of the records search, have since been removed. Furthermore, none of these 18 cultural resources was found immediately adjacent to the boundaries of the APE. The Fred Young Farm Labor Center, for example, is located on a parcel that is adjacent to the roadways in which the APE lies. Such resources, if present today, clearly have no potential to be affected by the trenching operations in the APE.

HISTORICAL OVERVIEW OF THE APE

Historical sources consulted for this study confirm that the area around the APE hosted a number of Native American settlements during the mid-19th century. In 1855-1856, when the U.S. government conducted the first systematic land survey in the vicinity, the surveyors reported two villages near the southeastern portion of the APE, one located in the area of present-day downtown Indio and the other a short distance east of Van Buren Street (Fig. 5). Within the APE itself, however, a few roads and trails were the only man-made features observed at that time (Fig. 5). The most prominent among these, traversing generally east and west across the southern portion of the APE, was evidently a branch of the historic Bradshaw Trail, and the direct forerunner of today's Highway 111 (Fig. 5).

By the turn of the 20th century, the Southern Pacific Railroad had become the most prominent man-made feature in and near the APE, and a small settlement with a cluster of buildings had developed around the railway station at Indio (Fig. 6). The road across the

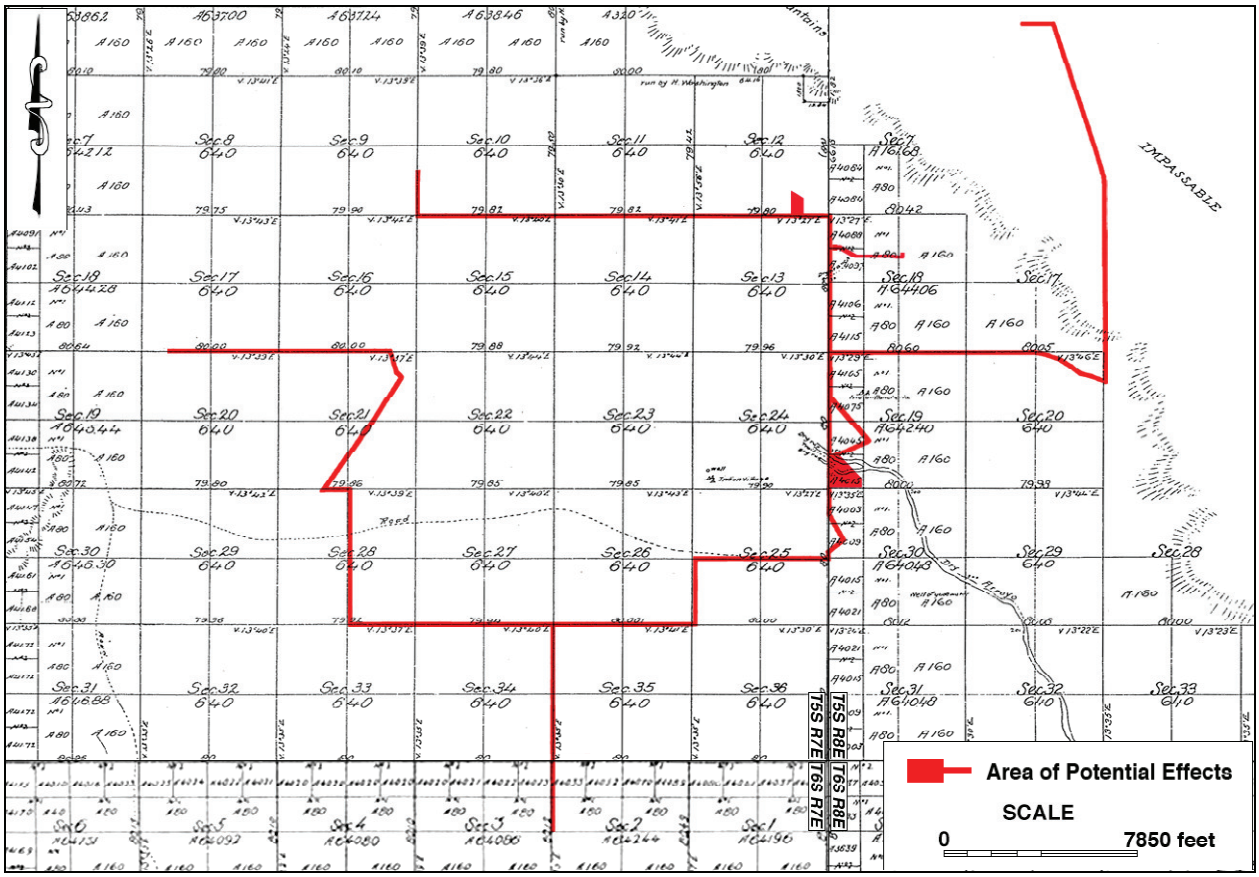

Figure 5. The APE and vicinity in 1855-1856. (Source: GLO 1856a; 1856b)

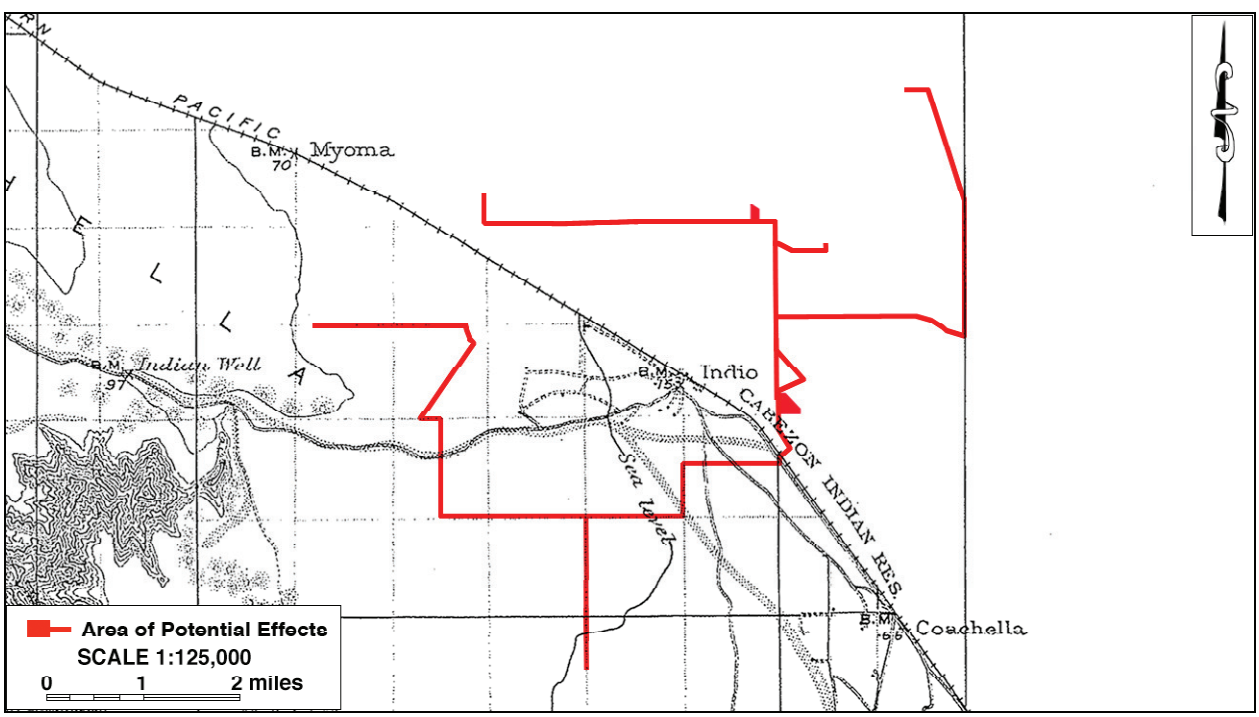

Figure 6. The APE and vicinity in 1901. (Source: USGS 1904)

southern portion of the APE remained in use, and had apparently become the main branch of the Bradshaw Trail, but the Native American village noted nearly a half-century before in present-day downtown Indio was no longer in existence (Fig. 6). Most of the land along the APE was clearly unsettled and undeveloped at that time.

Four decades later, a densely populated urban core had emerged in downtown Indio, and the rest of the area around the APE began to demonstrate a cultural landscape that was typical of rural southern California during the historic period, characterized by a regular grid of roads lined by scattered buildings and patches of orchards, most of them presumably date palm gardens (Fig. 7). One of the buildings was observed within the grounds of the existing wastewater treatment plant, and many of the roadways containing the APE had also come into being, although some remain unpaved dirt roads (Fig. 7). Although the urban core of Indio expanded significantly during the post-WWII boom, the overall settlement pattern in the surrounding area persisted well into the 1950s (Fig. 8).

NATIVE AMERICAN INPUT

In response to CRM TECH's inquiry, the Native American Heritage Commission reports in a letter dated June 8 that the sacred lands record search indicated the presence of Native American cultural resources within a half-mile radius of the APE, and recommends that local Native American groups be contacted for further information. For that purpose, the commission provided a list of potential contacts in the region (see App. 2).

Upon receiving the commission's response, CRM TECH initiated correspondence with all 13 individuals on the referral list and the organizations they represent. In addition, Yvonne Markle, Environmental Office Manager for the Cahuilla Band of Indians, David Limon Saldivar, Director of Tribal Government Affairs for the Augustine Band of Cahuilla Indians, Judy Stapp, Director of Cultural Affairs for the Cabazon Band of Mission Indians, John Gomez, Jr., Cultural Resources Coordinator for the Ramona Band of Cahuilla Indians, Steven Estrada, Environmental Director for the Santa Rosa Band of Cahuilla Indians, and Lisa Auclair, Planning/Administrative Assistant for the Torres Martinez Desert Cahuilla Indians, were also contacted (see App. 2).

As of this time, seven of the tribal representatives have responded to the request for comments. Among them, Steven Estrada of the Santa Rosa Band of Cahuilla Indians, Yvonne Markle of the Cahuilla Band of Indians, Francine Kupsch, Spokesperson for the Los Coyotes Band of Cahuilla and Cupeno Indians, and Michael Contreras, Jr., Cultural Heritage Program Coordinator for the Morongo Band of Mission Indians stated that they wished to defer to other tribes living in close proximity to the APE. Ms. Markle further indicated that the Cahuilla Band had monitors available if the undertaking would require Native American monitoring and no local tribes could be retained (see App. 2).

In a letter dated July 22, Lisa Auclair of the Torres Martinez Desert Cahuilla Indians referred CRM TECH to the Cabazon Band of Mission Indians, specifically to Judy Stapp, but offers to provide assistance to the Cabazon Band in the Native American colsultation process throughout this undertaking. She recommends that a cultural resources survey be completed by a qualified archaeologist, Native American monitors be present during any ground-disturbing activities in the APE, and copies of all cultural resource documentation be submitted to both the Torres Martinez and the Cabazon bands (see App. 2).

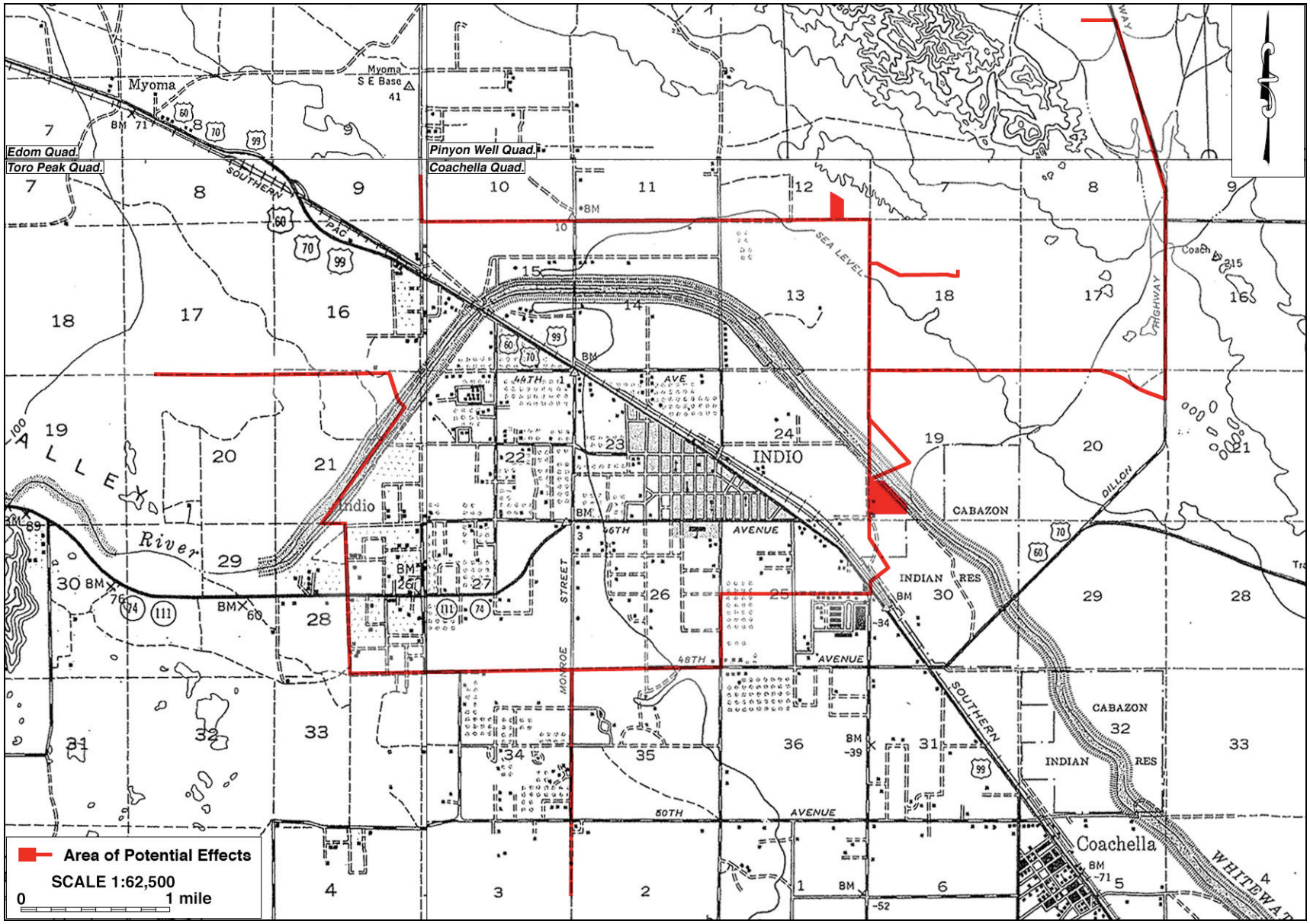

Figure 7. The APE and vicinity in 1941. (Source: USGS 1941a; 1941b; 1941c; 1943)

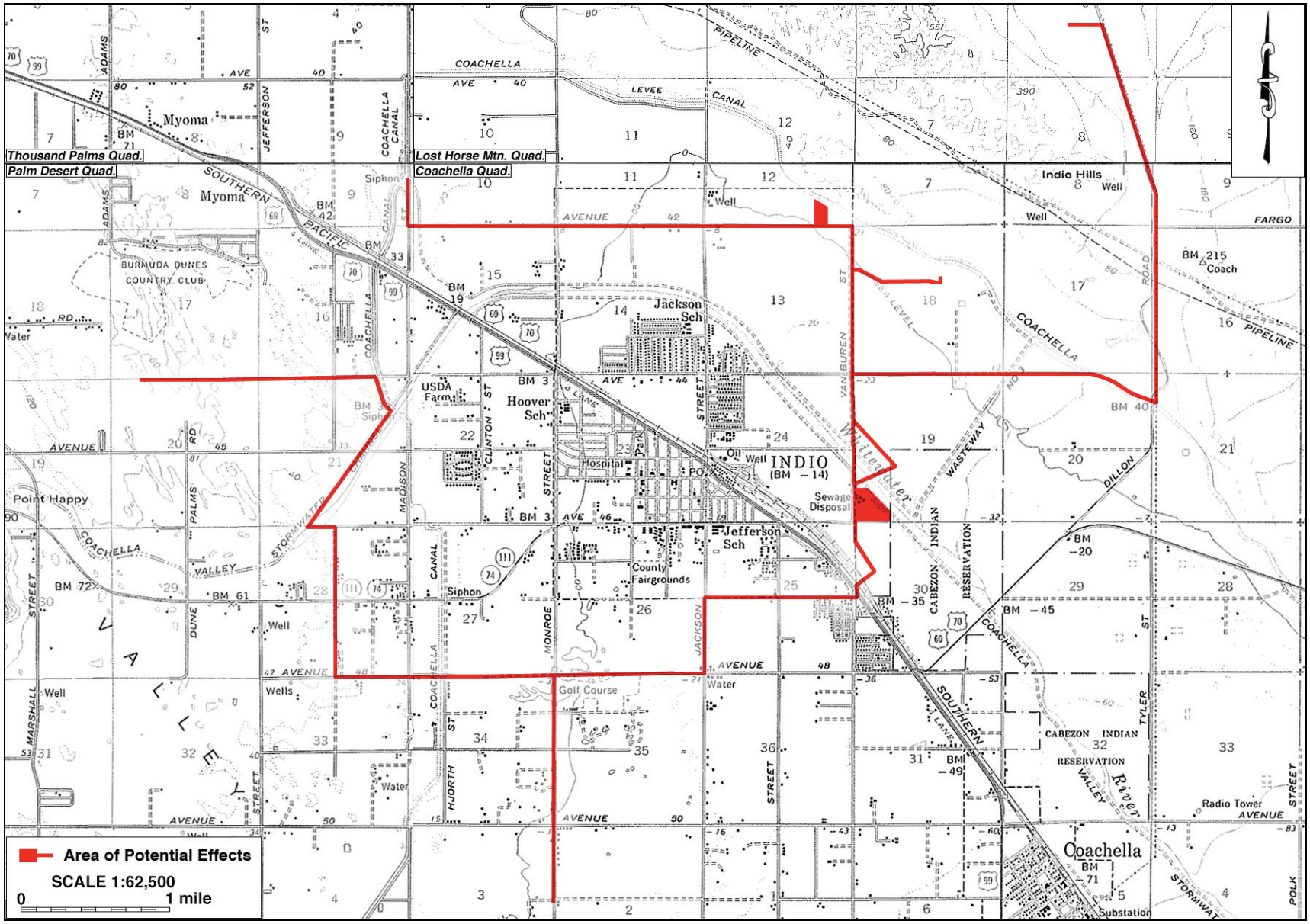

Figure 8. The APE and vicinity in 1952-1959. (Source: USGS 1956; 1958a; 1958b; 1959)

In letters dated June 25 and August 20, respectively, Judy Stapp of the Cabazon Band and Chairwoman Mary Ann Green of the Augustine Band of Cahuilla Indians state that their tribes are unaware of any Native American cultural resources that may be affected by the undertaking. Nevertheless, both of them recommend that a qualified archaeological expert monitor all ground-disturbing activities in the APE, and Ms. Green further requests immediate notification if any cultural resources are encountered during the undertaking (see App. 2).

POTENTIAL HISTORIC PROPERTIES/HISTORICAL RESOURCES IN THE APE

As stated above, three historic-period linear features were previously recorded as lying partially within the APE (Table 1). During the current survey, their presence was confirmed in the field, but no additional sites, features, or artifact deposits of historical or prehistoric origin were discovered. The three sites located partially within in the APE are discussed in further detail below.

33-005705 (Coachella Canal)

Site 33-005705 represents the entire length of the Coachella Canal within Riverside County. Constructed, owned, and operated by the Coachella Valley Water District, the 120-mile-long concrete-lined canal is in fact a branch of the All-American Canal. Its history can be traced back to 1928, when the U.S. Congress passed the Boulder Canyon Project Act, directing the federal government to build the All-American Canal to replace the old, inadequate and problematic Imperial Canal as the centerpiece of irrigation systems in the Imperial Valley (Bean and Rawls 1983:322). The main branch of the All-American Canal was completed in 1941 (*ibid.*:330), but due to delays caused by World War II, the Coachella Valley branch was not operational until 1948-1949 (Warren et. al. 1981:99; Maddox 1994). Since then, the Coachella Canal has served as the main source of irrigation as well as domestic water supply for residents of the Coachella Valley.

Near the western end of the APE, a small segment of the proposed pipeline route follows the course of the Coachella Canal between Fred Waring Drive (formerly Avenue 44) and the Coachella Valley Stormwater Channel, and another segment near the eastern end of the APE follows the canal on the western side of Dillon Road (Fig. 2a, 2b). At those locations, unpaved access roads run along either side of the canal, and the pipeline segments will be placed within these access roads. There, the Coachella Canal lies in close proximity to the APE but not within. The only locations where the Coachella Canal extends into the APE, therefore, are the two spots where the proposed pipeline will cross the canal along Dillon Road and Avenue 48, in both cases in nearly perpendicular angles (Fig. 2a, 2b).

33-009498 (Former Southern Pacific Railroad)

Site 33-009498 consists of the segment of the former Southern Pacific Railroad within Riverside County. Completed across the Coachella Valley in 1876-1877, it was the second transcontinental railroad to reach the Pacific Coast, both of them controlled by the infamous "Big Four" of the Southern Pacific Railroad Company, and the first modern transportation artery to link southern California to the rest of the nation. Now a part of the Union Pacific Railroad system, the line remains fully functional and under constant and heavy use.

As Figure 2b illustrates, the APE crosses the railroad near the eastern end of Dr. Carreon Boulevard (formerly Avenue 47). Due to repeated upgrading and constant maintenance, the physical components of the rail line today are mostly modern in origin and appearance, and by far postdate the golden age of the Southern Pacific Railroad, or that of the steel rails in general. Like other historic-period railroads that remain in use today, the former Southern Pacific line does not demonstrate any particular historical characteristics except in terms of its location.

33-017259 (Coachella Valley Stormwater Channel)

Site 33-017259 represents the course of the 50-mile-long Coachella Valley Stormwater Channel, which was also constructed by the Coachella Valley Water District, partially utilizing the Whitewater River bed. After torrential flooding changed the course of the river between Cathedral City and La Quinta in 1916, the altered riverbed became the "backbone" of the newly designated stormwater channel, which would carry the runoff to the Salton Sea (Laflin 1998:167; CVMD n.d.). The segment of the riverbed from La Quinta to the Salton Sea also evolved into a man-made channel to skirt communities and provide flood-control protection through earthen levees along its banks (Mahr 2008). By the 1930s-1950s, the presence of levees and dykes along the course of the former Whitewater River was well documented in historic maps (BOR 1938; Figs. 7, 8).

Over the years, the channel and levees have undergone periodic repairs and routine maintenance to insure that the banks are stable and that the brush does not become overgrown (Mahr 2008). The segment of the channel in the vicinity of the APE is typically defined by two parallel earthen levees, each topped by a dirt access road. The interior sides of the levees slope gently at approximately 18-20 degrees to the bottom of the riverbed, some 25-30 feet below the top of the levees. The slopes and river bottom sport a sparse growth of vegetation, primarily small desert shrubs and grasses.

The channel and the levees are well maintained, but do not demonstrate any remarkable characteristics in terms of design and engineering. In the western portion of the APE, the proposed pipeline route follows the course of the channel between the Coachella Canal and Westward Ho Drive, and then crosses it along Avenue 46 (Fig. 2a). In the eastern portion, two alternative routes of the pipeline alignment cross the channel near the northern end of Van Buren Street (Fig. 2b).

MANAGEMENT CONSIDERATIONS

DEFINITION

The purpose of this study is to identify and evaluate any "historic properties" or "historical resources" that may exist within or adjacent to the Area of Potential Effects of the proposed undertaking. "Historic properties," as defined by the Advisory Council on Historic Preservation, include "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior" (36 CFR 800.16(l)). The eligibility for inclusion in the National Register is determined by applying the following criteria, developed by the National Park Service as per provision of the National Historic Preservation Act:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) that are associated with the lives of persons significant in our past; or
(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) that have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR 60.4)

For CEQA-compliance considerations, the State of California's Public Resources Code (PRC) establishes the definitions and criteria for "historical resources," which require similar protection to what NHPA Section 106 mandates for historic properties. "Historical resources," according to PRC §5020.1(j), "includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California."

More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the Lead Agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria of historical significance, CEQA guidelines mandate that "a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

DISCUSSION

In summary of the research results discussed above, three historic-period linear features, 33-005705 (Coachella Canal), 33-009498 (former Southern Pacific Railroad), and 33-017259 (Coachella Valley Stormwater Channel), were previously identified as lying partially within the APE, and their presence was confirmed through the field survey. The Section 106- and CEQA- compliance issues pertaining to these three sites are discussed in the sections below.

33-005705 (Coachella Canal)

During a recent study that was completed in 2005, the Coachella Canal was determined to be eligible for listing in the National Register of Historic Places because of its close association with "the enormous public works effort arising from the Boulder Canyon Act" and as an example of the "state-of-the-art construction methods and innovative approaches to working in extreme desert temperatures" (Schaefer et al. 2003:5.5-5.6). Since all properties found eligible for the National Register are automatically considered eligible for the California Register, Site 33-005705 clearly meets the definitions of a "historic property" under Section 106 and a "historical resource" under the CEQA.

Under current regulatory guidelines, however, in most cases cultural resources studies for linear infrastructure projects that simply cross such irrigation canals may exclude them from the APE because there is generally little potential for their historical characteristics and significance to be affected (JRP and Caltrans 2000:1). In this case, the only locations where the Coachella Canal extends into the APE are the two spots where the proposed pipeline will cross the canal in nearly perpendicular angles. In light of the minimal potential for the undertaking to affect the overall characteristics and physical atributes of Site 33-005705, it was determined that this provision applies. Therefore, Site 33-005705 is excluded from the APE and requires no further consideration.

33-009498 (Former Southern Pacific Railroad)

The former Southern Pacific Railroad once played a crucial role in the development of the region and the state at large, and demonstrates the basic potential to meet Criterion A for the National Register and/or Criterion 1 for the California Register. However, as a working element of the modern transportation infrastructure, the rail line today is characterized by physical components that are mostly modern in age and in appearance, and retains little historic integrity, except for its location, to relate to its potential period of significance, namely the late 19th and early 20th centuries, or to the historic period in general. For that reason, Site 33-009498 does not appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources, and does not constitute a "historic property" or a "historical resource."

33-017259 (Coachella Valley Stormwater Channel)

As mentioned above, the Coachella Valley Stormwater Channel was determined not to be eligible for the California Register of Historical Resources during a 2008 study (Tang and Quinn 2008:5). As that study states:

> It could be argued that the channel played an important part in the accelerated growth of the Coachella Valley since the early 20th century, which was certainly a pattern of events that made significant contributions to regional history. The development of the desert valley, by necessity, was contingent on not only the control but also the supply and distribution of water, in which the Whitewater River/Coachella Valley Stormwater Channel and the Coachella Canal served in similar capacities, if not with equal importance.
>
> Unlike the Coachella Canal, however, the stormwater channel is based on a natural waterway with only limited human alterations, at least at this location, and does not

> demonstrate any notable design or engineering qualities. Furthermore, as an element of the historic-period infrastructure that remains in use today, the channel and its largely nondescript components do not retain any features that are particularly historic in appearance. Therefore, the channel's association with the pattern of events in its history and its potential period of significance is compromised considerably by the lack of any specifically historical characteristics and the questionable historic integrity.
>
> For the same reasons, the existing stormwater channel does not represent an important example of its property type or method of construction. It is not recognized as a structure of high artistic or aesthetic value, nor is it known to be the work of a prominent designer, builder, or engineer. Despite extensive research, no persons or specific events of known historic significance have been identified in close association with the segment of stormwater channel in the project area, or with the stormwater channel in general. Meanwhile, as a common infrastructure element that required only limited construction work to create, the channel retains little data potential for the study of regional history or the history of engineering. (Tang and Quinn 2008:4-5)

Based on these considerations, the present study concludes that Site 33-017259 does not appear eligible for listing in the National Register of Historic Places, either, and thus does not qualify as a "historic property" or a "historical resource."

CONCLUSION AND RECOMMENDATIONS

Section 106 of the National Historic Preservation Act mandates that federal agencies take into account the effects of their undertakings on historic properties and seek ways to avoid, minimize, or mitigate any adverse effects on such properties (36 CFR 800.1(a)). Similarly, CEQA establishes that "a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired."

As stated above, three previously recorded cultural resources, Sites 33-005705 (Coachella Canal), 33-009498 (former Southern Pacific Railroad), and 33-017259 (Coachella Valley Stormwater Channel), were encountered during the course of this study. Among them, Site 33-005705 was previously determined to be a "historic property" and "historical resource," but is excluded from the APE pursuant to current regulatory guidelines. Neither of the other two sites appears to meet the definitions of a "historic property" or a "historical resource."

No other potential "historic properties" or "historical resources" were identified within or adjacent to the APE during this study. Based on these findings, and pursuant to 36 CFR 800.4(d)(1) and Calif. PRC §21084.1, CRM TECH recommends to the IWA and the USDA a conclusion that *no "historic properties" or "historical resources" will be affected by the proposed undertaking*. No further cultural resources investigation is recommended for the undertaking unless project plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are encountered during earth-moving operations, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

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BOR (Bureau of Reclamation, U.S. Department of the Interior)
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CVWD (Coachella Valley Water District)
n.d. Water and the Coachella Valley. Http://www.cvwd.org/about/waterandcv.

GLO (General Land Office, U.S. Department of the Interior)
1856a Plat Map: Township No. 5 South Range No. 7 East, San Bernardino Meridian; surveyed in 1855-1856.
1856b Plat Map: Township No. 5 South Range No. 8 East, San Bernardino Meridian; surveyed in 1855-1856.

Gunther, Jane Davies
1984 *Riverside County, California, Place Names: Their Origins and Their Stories*. J. D. Gunther, Riverside.

Johnston, Francis J.
1987 *The Bradshaw Trail*; revised edition. Historical Commission Press, Riverside.

JRP (JRP Historical Consulting Services) and Caltrans (California Department of Transportation)
2000 Water Conveyance Systems in California: Historic Context Development and Evaluation Procedures. Issued by the Cultural Studies Office, Caltrans Environmental Program, Sacramento.

Kroeber, Alfred L.
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Laflin, Patricia
1998 *Coachella Valley California: A Pictorial History.* The Donning Company, Virginia Beach, Virginia.

Mahr, Dennis (Director of Communications and Legislation, Coachella Valley Water District)
2008 Personal communication; interviewed via telephone.

Maddox, Joseph (Engineering Department, Coachella Valley Water District)
1994 Personal communication; interviewed in person at the Engineering Department, Coachella Valley Water District, Coachella.

Robinson, W. W.
1948 *Land in California.* University of California Press, Berkeley.

Ross, Delmer G.
1992 *Gold Road to La Paz: An Interpretive Guide to the Bradshaw Trail*. Tales of the Mojave Road Publishing Company, Essex, California.

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Lake Cahuilla, Imperial and Riverside Counties, California. Prepared by ASM Affiliates, Inc., Encinitas, California, for the Coachella Valley Water District, Coachella, California, and the U.S. Department of the Interior, Bureau of Reclamation, Boulder City, Nevada.

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USGS (United States Geological Survey, U.S. Department of the Interior)

1904 Map: Indio, Calif. (30', 1:125,000); surveyed in 1901.

1941a Map: Coachella, Calif. (15', 1:62,500); aerial photographs taken in 1941.

1941b Map: Edom, Calif. (15', 1:62,500); aerial photographs taken in 1941.

1941c Map: Toro Peak, Calif. (15', 1:62,500); aerial photographs taken in 1941.

1943 Map: Pinyon Well, Calif. (15', 1:62,500); aerial photographs taken in 1941.

1956 Map: Coachella, Calif. (15', 1:62,500); aerial photographs taken in 1952 and 1953, field-checked in 1955-1956.

1958a Map: Lost Horse Mtn., Calif. (15', 1:62,500); aerial photographs taken in 1956, field-checked in 1958.

1958b Map: Thousand Palms, Calif. (15', 1:62,500); aerial photographs taken in 1951 and 1956, field-checked in 1958.

1959 Map: Palm Desert, Calif. (15', 1:62,500); aerial photographs taken in 1954, field-checked in 1957 and 1959.

1972 Map: Indio, Calif. (7.5', 1:24,000); 1956 edition photorevised in 1972.

1978 Map: Myoma, Calif. (7.5', 1:24,000); 1958 edition photorevised in 1972 and photoinspected in 1978.

1979 Map: Santa Ana, Calif. (1:250,000); 1959 edition revised.

1980 Map: La Quinta, Calif. (7.5', 1:24,000); 1959 edition photorevised in 1978.

1988 Map: West Berdoo Canyon, Calif. (7.5', 1:24,000); aerial photographs taken in 1984, field-checked in 1985.

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APPENDIX 1

PERSONNEL QUALIFICATIONS

PRINCIPAL INVESTIGATOR/HISTORIAN
Bai "Tom" Tang, M.A.

Education

1988-1993	Graduate Program in Public History/Historic Preservation, UC Riverside.
1987	M.A., American History, Yale University, New Haven, Connecticut.
1982	B.A., History, Northwestern University, Xi'an, China.

2000	"Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno.
1994	"Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1993-2002	Project Historian/Architectural Historian, CRM TECH, Riverside, California.
1993-1997	Project Historian, Greenwood and Associates, Pacific Palisades, California.
1991-1993	Project Historian, Archaeological Research Unit, UC Riverside.
1990	Intern Researcher, California State Office of Historic Preservation, Sacramento.
1990-1992	Teaching Assistant, History of Modern World, UC Riverside.
1988-1993	Research Assistant, American Social History, UC Riverside.
1985-1988	Research Assistant, Modern Chinese History, Yale University.
1985-1986	Teaching Assistant, Modern Chinese History, Yale University.
1982-1985	Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China.

Honors and Awards

1988-1990	University of California Graduate Fellowship, UC Riverside.
1985-1987	Yale University Fellowship, Yale University Graduate School.
1980, 1981	President's Honor List, Northwestern University, Xi'an, China.

Cultural Resources Management Reports

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (with Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

Membership

California Preservation Foundation.

PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST
Michael Hogan, Ph.D., RPA*

Education

1991	Ph.D., Anthropology, University of California, Riverside.
1981	B.S., Anthropology, University of California, Riverside; with honors.
1980-1981	Education Abroad Program, Lima, Peru.

2002	Section 106—National Historic Preservation Act: Federal Law at the Local Level. UCLA Extension Course #888.
2002	"Recognizing Historic Artifacts," workshop presented by Richard Norwood, Historical Archaeologist.
2002	"Wending Your Way through the Regulatory Maze," symposium presented by the Association of Environmental Professionals.
1992	"Southern California Ceramics Workshop," presented by Jerry Schaefer.
1992	"Historic Artifact Workshop," presented by Anne Duffield-Stoll.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist/Field Director, CRM TECH, Riverside.
1996-1998	Project Director and Ethnographer, Statistical Research, Inc., Redlands.
1992-1998	Assistant Research Anthropologist, University of California, Riverside
1992-1995	Project Director, Archaeological Research Unit, U. C. Riverside.
1993-1994	Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C. Riverside, Chapman University, and San Bernardino Valley College.
1991-1992	Crew Chief, Archaeological Research Unit, U. C. Riverside.
1984-1998	Archaeological Technician, Field Director, and Project Director for various southern California cultural resources management firms.

Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

Cultural Resources Management Reports

Author and co-author of, contributor to, and principal investigator for numerous cultural resources management study reports since 1986.

Memberships

* Register of Professional Archaeologists.
Society for American Archaeology.
Society for California Archaeology.
Pacific Coast Archaeological Society.
Coachella Valley Archaeological Society.

PROJECT ARCHAEOLOGIST/REPORT WRITER
Deirdre Encarnación, M.A.

Education

2003	M.A., Anthropology, San Diego State University, California.
2000	B.A., Anthropology, minor in Biology, with honors; San Diego State University, California.
1993	A.A., Communications, Nassau Community College, Garden City, N.Y.
2001	Archaeological Field School, San Diego State University.
2000	Archaeological Field School, San Diego State University.

Professional Experience

2004-	Project Archaeologist/Report Writer, CRM TECH, Riverside/Colton, California.
2001-2003	Part-time Lecturer, San Diego State University, California.
2001	Research Assistant for Dr. Lynn Gamble, San Diego State University.
2001	Archaeological Collection Catalog, SDSU Foundation.

PROJECT ARCHAEOLOGIST
Nina Gallardo, B.A.

Education

2004 B.A., Anthropology/Law and Society, University of California, Riverside.

Professional Experience

2004- Project Archaeologist, CRM TECH, Riverside/Colton, California.
- Surveys, excavations, mapping, and records searches.

Honors and Awards

2000-2002 Dean's Honors List, University of California, Riverside.

PROJECT ARCHAEOLOGIST/FIELD DIRECTOR
Daniel Ballester, B.A.

Education

1998	B.A., Anthropology, California State University, San Bernardino.
1997	Archaeological Field School, University of Las Vegas and University of California, Riverside.
1994	University of Puerto Rico, Rio Piedras, Puerto Rico.
2007	Certificate in Geographic Information Systems (GIS), California State University, San Bernardino.
2002	"Historic Archaeology Workshop," presented by Richard Norwood, Base Archaeologist, Edwards Air Force Base; presented at CRM TECH, Riverside, California.

Professional Experience

2002-	Field Director, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist, CRM TECH, Riverside, California.
1998-1999	Field Crew, K.E.A. Environmental, San Diego, California.
1998	Field Crew, A.S.M. Affiliates, Encinitas, California.
1998	Field Crew, Archaeological Research Unit, University of California, Riverside.

APPENDIX 2

CORRESPONDENCE WITH NATIVE AMERICAN REPRESENTATIVES*

* A total of 19 local Native American representatives were contacted. A sample letter is included in this report.

From: Daniel Ballester <mailto:dballester@crmtech.us>
Sent: Friday, May 21, 2010 9:28 AM
To: Dave Singleton <ds_nahc@pacbell.net>
Subject: Sacred Land RS

Dave:

This is to request a Sacred Lands records search

Name of project:
City of Indio Water Authority Wastewater Treatment Project
CRM TECH # 2451 (Indio Water)

Project size:
Approximately 50+ acres and 22 linear miles

Location:
In the City of Indio, Riverside County, Calif.

USGS 7.5' quad sheet data:
La Quinta, Indio, West Berdoo Canyon, Calif.
T5S R7E and T5S R8E, SBBM

Map attached.

Please call if you need more information or have any questions. Results may be faxed to the number below.

I appreciate your assistance in this matter.

Daniel Ballester
CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

office: (909) 824-6400
fax: (909) 824-6405
cell: (909) 376-7842
dballester@crmtech.us

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

June 8, 2010

Mr. Daniel Ballester, RPA
CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Sent by FAX to: 909-824-6405
No. of Pages: 4

Re: Request for a Sacred Lands File Search and Native American Contacts List **for the proposed " City of Indio Water Authority Wastewater Treatment Facility Project (CRM TECH #2451)"** located in the City of Indio; Riverside County, California

Dear Mr. Ballester:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources. The NAHC SLF search **did Indicate** the presence of Native American cultural resources within one-half mile of the proposed project site (APE).

Also, this letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law.

The California Environmental Quality Act (CEQA - CA Public Resources Code §21000-21177, amended in 2009) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE)', and if so, to mitigate that effect.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway., Culturally-affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation Coordinator's office (at (916) 653-7278, for referral to the nearest Information Center of which there are 10.

Consultation with tribes and interested Native American consulting parties, on the NAHC list ,should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f]*et seq),* 36 CFR Part 800.3 (f) (2), the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. . The 1992 *Secretary of the Interior's Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including *cultural landscapes.*

Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery.

To be effective, consultation on specific projects must be the result of an on-going relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects.

The response to this search for Native American cultural resources is conducted in the NAHC Sacred Lands Inventory, established by the California Legislature (CA Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10) although Native Americans on the attached contact list may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contacts

Native American Contacts
June 8, 2010
Riverside County

Cabazon Band of Mission Indians
David Roosevelt, Chairperson
84-245 Indio Springs Cahuilla
Indio , CA 92203-3499
(760) 342-2593
(760) 347-7880 Fax

Torres-Martinez Desert Cahuilla Indians
Ernest Morreo
PO Box 1160 Cahuilla
Thermal , CA 92274
maxtm@aol.com
(760) 397-0300
(760) 397-8146 Fax

Los Coyotes Band of Mission Indians
Francine Kupsch, Spokesperson
P.O. Box 189 Cahuilla
Warner , CA 92086
loscoyotes@earthlink.net
(760) 782-0711
(760) 782-2701 - FAX

Santa Rosa Band of Mission Indians
John Marcus, Chairman
P.O. Box 609 Cahuilla
Hemet , CA 92546
srtribaloffice@aol.com
(951) 658-5311
(951) 658-6733 Fax

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

Augustine Band of Cahuilla Mission Indians
Mary Ann Green, Chairperson
P.O. Box 846 Cahuilla
Coachella , CA 92236
(760) 369-7171
760-369-7161

Torres-Martinez Desert Cahuilla Indians
Mary Resvaloso, Chairperson
PO Box 1160 Cahuilla
Thermal , CA 92274
mresvaloso@torresmartinez.
(760) 397-0300
(760) 397-8146 Fax

Morongo Band of Mission Indians
Michael Contreras, Cultural Heritage Prog.
12700 Pumarra Road Cahuilla
Banning , CA 92220 Serrano
mcontreras@monongo-nsn.
(951) 755-5025
(951)201-1866 - cell
(951) 922-0105 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and federal NAGPRA. And 36 CFR Part 800.3.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed City of Indio Water Authority Wastewater Treatment Facility Project (CRM TECH #2451); located in the City of Indio; Coachella Valley; Riverside County, California for which a Sacred Lands File search and Native American Contacts

Native American Contacts
June 8, 2010
Riverside County

Torres-Martinez Desert Cahuilla Indians
Diana L. Chihuahua, Cultural Resources
P.O. Boxt 1160 Cahuilla
Thermal , CA 92274
dianac@torresmartinez.org
760) 397-0300, Ext. 1209
(760) 272-9039 - cell (Lisa)
(760) 397-8146 Fax

Cahuilla Band of Indians
Luther Salgado, Sr., , Chairperson
PO Box 391760 Cahuilla
Anza , CA 92539
tribalcouncil@cahuilla.net
915-763-5549

Los Coyotes Band of Mission Indians
Evelyn Duro, Tribal Administrator
P.O. Box 189 Cahuilla
Warner , CA 92086
(760) 782-0711
(760) 782-2701 - FAX

Agua Caliente Band of Cahuilla Indians THPO
Patricia Tuck, Tribal Historic Perservation Officer
5401 Dinah Shore Drive Cahuilla
Palm Springs, CA 92264
ptuck@aguacaliente-nsn.gov

(760) 699-6907
(760) 699-6924- Fax

Augustine Band of Cahuilla Mission Indians
Karen Kupcha
P.O. Box 846 Cahuilla
Coachella , CA 92236
(760) 369-7171
916-369-7161

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and fed eral NAGPRA. And 36 CFR Part 800.3.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed City of Indio Water Authority Wastewater Treatment Facility Project (CRM TECH #2451); located in the City of Indio; Coachella Valley; Riverside County, California for which a Sacred Lands File search and Native American Contacts

CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

June 11, 2010

Judy Stapp, Director of Cultural Affairs
Cabazon Band of Cahuilla Mission Indians
84-245 Indio Springs Parkway
Indio, CA 92203-3499

RE: City of Indio Water Authority Wastewater Treatment Project
City of Indio, Riverside County
CRM TECH Contract #2451

Dear Ms. Stapp:

As part of a cultural resources study for the project referenced above, I am writing to request your input on potential Native American cultural resources in or near the Area of Potential Effects (APE). Please respond at your earliest convenience if you have any specific knowledge of sacred/religious sites or other sites of Native American traditional cultural value within or near the APE. The lead agency for this project is the Indio Water Authority for CEQA- and Section 106-compliance purposes.

The proposed project involves the addition of approximately 22 linear miles of pipeline, four wells, and alternate groundwater recharge locations to the existing infrastructure for wastewater treatment in the City of Indio, Riverside County. The accompanying map, based on the USGS La Quinta, Indio, and West Berdoo Canyon, Calif., 7.5' quadrangles, depicts the location of the project area in T5S R7E and T5S R8E, SBBM.

The Native American Heritage Commission reports that a sacred lands record search for the APE does indicate the presence of Native American cultural resources within a half-mile radius of the proposed APE (see attached). Any information, concerns or recommendations regarding cultural resources in the vicinity of the APE may be forwarded to CRM TECH by telephone, e-mail, facsimile or standard mail. Requests for documentation or information we cannot provide will be forwarded to our client and/or the lead agency. We would also like to clarify that CRM TECH, as the cultural resources consultant for the project, is not the appropriate entity to initiate government-to-government consultations. Thank you for the time and effort in addressing this important matter.

Respectfully,

Laura Hensley Shaker
CRM TECH

Encl.: APE map

June 25, 2010

Laura Hensley Shaker
CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Re.: City of Indio Water Authority Wastewater Treatment Plant
City of Indio, Riverside County
CRM TECH Contract #2451

Dear Ms. Shaker:

Thank you for contacting the Cabazon Band of Mission Indians regarding the above referenced project.

The project is located outside of Cabazon Reservation lands. The Tribe has no specific archival information on the site indicating cultural resources within or near the property or that it may be a Native American sacred/religious site. The Cabazon Band recommends that there be a qualified archaeologist on site during ground disturbing activities and grading because of possible unknown cultural sites in the project area.

We look forward to continued collaboration in the preservation of cultural resources or areas of traditional cultural importance.

Sincerely,

Judy Stapp
Director of Cultural Affairs

THE TORRES MARTINEZ DESERT CAHUILLA INDIANS
P.O. Box 1160
Thermal, CA 92274
(760) 397-0300 – FAX (760) 397-8146

July 22, 2010

Laura Hensley Shaker
CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, California 92324

Re: City of Indio Water Authority Wastewater Treatment Project
City of Indio, Riverside County
CRM TECH Contract #2451

Dear Mrs. Shaker:

On behalf of the Torres Martinez Desert Cahuilla Indians (TMDCI) I appreciate your efforts to include the Tribe on Cultural Resources matters. Please contact Judy Stapp, of the Cabazon Band of Mission Indians for their comments at 84245 Indio Springs Parkway, Indio, CA 92203, or by telephone at (760)342-2593.

Although this project is beyond the Torres Martinez Indian Reservation Traditional Use Area, it is likely that the Tribe will provide cultural resource support to the Cabazon Band of Mission Indians. As such we make the following recommendations:

1. Make available for Cabazon band of Mission Indians and TMDCI to evaluation any cultural resources assessment or documentation in regards to cultural sites, sacred sites, traditional cultural property or gathering site of the Tribe. The Tribe's main concern is the potential for inadvertent discovery of human remains within the project area.
2. Cabazon Band of Mission Indians and TMDCI will be involved in any and all consultation throughout the project.
3. Complete a 100% cultural resources inventory of the project area by a qualified archaeologist prior to any development activities in this area. The archaeologist shall be accompanied by cultural resource monitor (s) at all times.

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4. Approved Cultural Resource Monitor(s) shall be present during all ground disturbing activities. Should buried cultural deposits be encountered, the monitor may request that destructive construction halt and the Monitor shall notify a Qualified (Secretary of the Interior's Standards and Guidelines) Archaeologist to investigate and, if necessary, prepare a mitigation plan for submission to the County and the TMDCI.
5. Additionally, in accordance with State law, the County Coroner should be contacted if any human remains are found during earthmoving activities. If the remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) shall be contacted.
6. The NAHC will make a determination of the Most Likely Descendent (MLD). The City will work with the designated MLD to determine the final disposition of the remains.
7. Copies of any cultural resource documentation including reports and site records are sent to the Cabazon Band of Mission Indians.

Should you have any questions regarding this matter, please feel free to contact me at lmilward2@torresmartinez.org, or at (760) 397-0300, extension 1215.

Sincerely,

Lisa M. Auclair

Lisa Milward Auclair
Planning Assistant

cc: Judy Stapp, Cabazon Band of Mission Indians

From: Mike Contreras <MContreras@morongo-nsn.gov>
Date: Mon, 16 Aug 2010 16:03:26 -0400
To: Laura Shaker <lshaker@crmtech.us>
Subject: RE: Responses to Native American scoping letters

Thank you Laura!

Morongo will defer to those tribes that are more local to those projects.

Michael Contreras Jr.
Morongo Band of Mission Indians
Cultural Heritage Program Coordinator
12700 Pumarra Road
Banning, CA. 92220
951-755-5025 Office
951-572-6004 Fax
mcontreras@morongo-nsn.gov

From: Steven Estrada <sestrada44@aol.com>
Date: Tue, 17 Aug 2010 18:36:38 -0400
To: Laura Shaker <lshaker@crmtech.us>
Subject: Re: Responses to Native American scoping letters

Hi Laura,

The Santa Rosa Band does have concerns pertaining to cultural resources that may be in the area. At this time Santa Rosa will defer further consultation to Torres Martinez on both projects.

Thank you,
Steven

AUGUSTINE BAND OF CAHUILLA INDIANS

P.O. Box 846 • Coachella, CA 92236 • (760) 398-4722 • Fax (760) 398-4252
Tribal Chairperson: MaryAnn Green

August 20, 2010

Laura Hensley Shaker
CRM Tech
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

RE: City of Indio Water Authority Wastewater Treatment Project (Indio, CA)

Dear Ms. Hensley Shaker:

Thank you for the opportunity to offer input concerning the development of the above-identified project. We appreciate your sensitivity to the cultural resources that may be impacted by your project, and the importance of these cultural resources to the Native American peoples that have occupied the land surrounding the area of your project for thousands of years. Unfortunately, increased development and lack of sensitivity to cultural resources has resulted in many significant cultural resources being destroyed or substantially altered and impacted. Your invitation to consult on this project is greatly appreciated.

At this time we are unaware of specific cultural resources that may be affected by the proposed project. We encourage you to contact other Native American Tribes and individuals within the immediate vicinity of the project site that may have specific information concerning cultural resources that may be located in the area. We also encourage you to contract with a monitor who is qualified in Native American cultural resources identification and who is able to be present on-site full-time during the pre-construction and construction phase of the project. Please notify us immediately should you discover any cultural resources during the development of this project.

Very truly yours,

Augustine Band of Cahuilla Indians

Mary Ann Green
Tribal Chairperson

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TELEPHONE LOG

Name	Tribe/Affiliation	Telephone Contacts	Comments
Patricia Garcia-Tuck, Director of Tribal Historic Preservation	Agua Caliente Band of Cahuilla Indians	11:53 am, August 16 12:11 pm, August 18	Left messages; no response to date.
Mary Ann Green, Chairperson	Augustine Band of Cahuilla Mission Indians	None	Ms. Green responded in a letter dated August 10 (copy attached).
Karen Kupcha	Augustine Band of Cahuilla Mission Indians	11:55 am, August 16 12:11 pm, August 18	Left messages; no response to date.
David Limon Saldivar, Director of Tribal Government Affairs	Augustine Band of Cahuilla Mission Indians	12:10 pm, August 16	The tribe would review the letter again and respond at a later date.
David Roosevelt, Chairperson	Cabazon Band of Mission Indians	None	Judy Stapp responded on behalf of the tribe (see below).
Judy Stapp, Director of Cultural Affairs	Cabazon Band of Mission Indians	None	Ms. Stapp responded in a letter dated June 25 (copy attached).
Luther Salgado, Sr.	Cahuilla Band of Indians	None	Yvonne Markle responded on behalf of the tribe (see below).
Yvonne Markle, Environmental Office Manager	Cahuilla Band of Indians	12:10 pm, August 16	Ms. Markle would defer to the Torres Martinez and Augustine bands for this undertaking. If the undertaking requires Native American monitoring and neither group can be retained, the Cahuilla Band will be available.
Evelyn Duro, Tribal Administrator	Los Coyotes Band of Cahuilla and Cupeno Indians	None	Francine Kupsch responded on behalf of the tribe (see below).
Francine Kupsch, Spokesperson	Los Coyotes Band of Cahuilla and Cupeno Indians	11:21 am, August 16 12:15 pm, August 19	Ms. Kupsch wished to defer to other tribes located closer to the APE.
Mike Contreras, Jr., Cultural Heritage Program Coordinator	Morongo Band of Mission Indians	12:35 pm, August 16	Mr. Contreras responded by e-mail on August 16 (copy attached).
Joseph Hamilton, Chairman	Ramona Band of Cahuilla Indians	None	John Gomez, Jr., is the designated spokesperson for the tribe (see below).
John Gomez, Jr., Cultural Resources Coordinator	Ramona Band of Cahuilla Indians	12:36 pm, August 16 12:25 pm August 18	Left messages; no response to date.

John Marcus, Chairperson	Santa Rosa Band of Cahuilla Indians	None	Steven Estrada responded on behalf of the tribe (see below).
Steven Estrada, Environmental Director	Santa Rosa Band of Cahuilla Indians	12:42 pm, August 16	Mr. Estrada responded by e-mail on August 17 (copy attached).
Lisa Auclair, Administrative Assistant	Torres Martinez Desert Cahuilla Indians	None	Ms. Auclair responded in a letter dated July 22 (copy attached).
Diana Chihuahua, Cultural Resources Coordinator	Torres Martinez Desert Cahuilla Indians	None	Lisa Auclair responded on behalf of the tribe (see above).
Ernest Morreo, Tribal Elder	Torres Martinez Desert Cahuilla Indians	None	Lisa Auclair responded on behalf of the tribe (see above).
Mary Resvaloso, Chairperson	Torres Martinez Desert Cahuilla Indians	None	Lisa Auclair responded on behalf of the tribe (see above).

CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

March 16, 2011

Tom Dodson, President
Tom Dodson and Associates
2150 North Arrowhead Avenue
San Bernardino, CA 92405

Re: Addendum to the Identification and Evaluation of Historic Properties Report
For the Indio Water Authority Wastewater Treatment Project
Cities of Indio and La Quinta
Riverside County, California
CRM TECH Contract No. 2451 B

To Whom It Concerns:

At the request of Tom Dodson and Associates, CRM TECH has conducted additional research for the project referenced above. The research is required since a portion of the Area of Potential Effects (APE), namely satellite treatment facility sites, were not included in the early study area. These parcels are located on vacant land next to the Indio Municipal Golf Course and within and near Posse Park, along the north side of Avenue 42, west of Golf Center Parkway, in the City of Indio, Riverside County, California. These portions of the APE are located within Section 12 of T5S R7E, SBBM (Fig. 1).

The study is a part of the environmental review process for a proposed wastewater/ recycled water treatment project in the Cities of Indio and La Quinta, Riverside County, California. The undertaking, as proposed by the Indio Water Authority (IWA), involves primarily the installation of approximately 22 linear miles of alternative pipeline routes. In addition, it also includes the installation of a tertiary treatment system, one or more groundwater recharge treatment facilities, and new aquifer storage recovery (ASR) wells, or the conversion of existing wells to ASR functions. It now includes satellite treatment facilities, which are the subject of this addendum letter report. It should be noted that a portion of the Posse Park area was included in the original study (Encarnación and Ballester 2010) (see Fig. 1).

The lead agency for the undertaking, namely the IWA, required the study pursuant to the California Environmental Quality Act (CEQA). In anticipation of future project review by the Rural Utilities Service of the United States Department of Agriculture (USDA), the study was conducted in compliance with both CEQA and Section 106 of the National Historic Preservation Act. The purpose of the study is to provide the IWA and the USDA with the necessary information and analysis to determine whether the proposed undertaking would have an effect on any "historic properties," as defined by 36 CFR 800.16(l), or "historical resources," as defined by Title 14 CCR §15064.5(a)(1)-(3), that may exist in or near the APE.

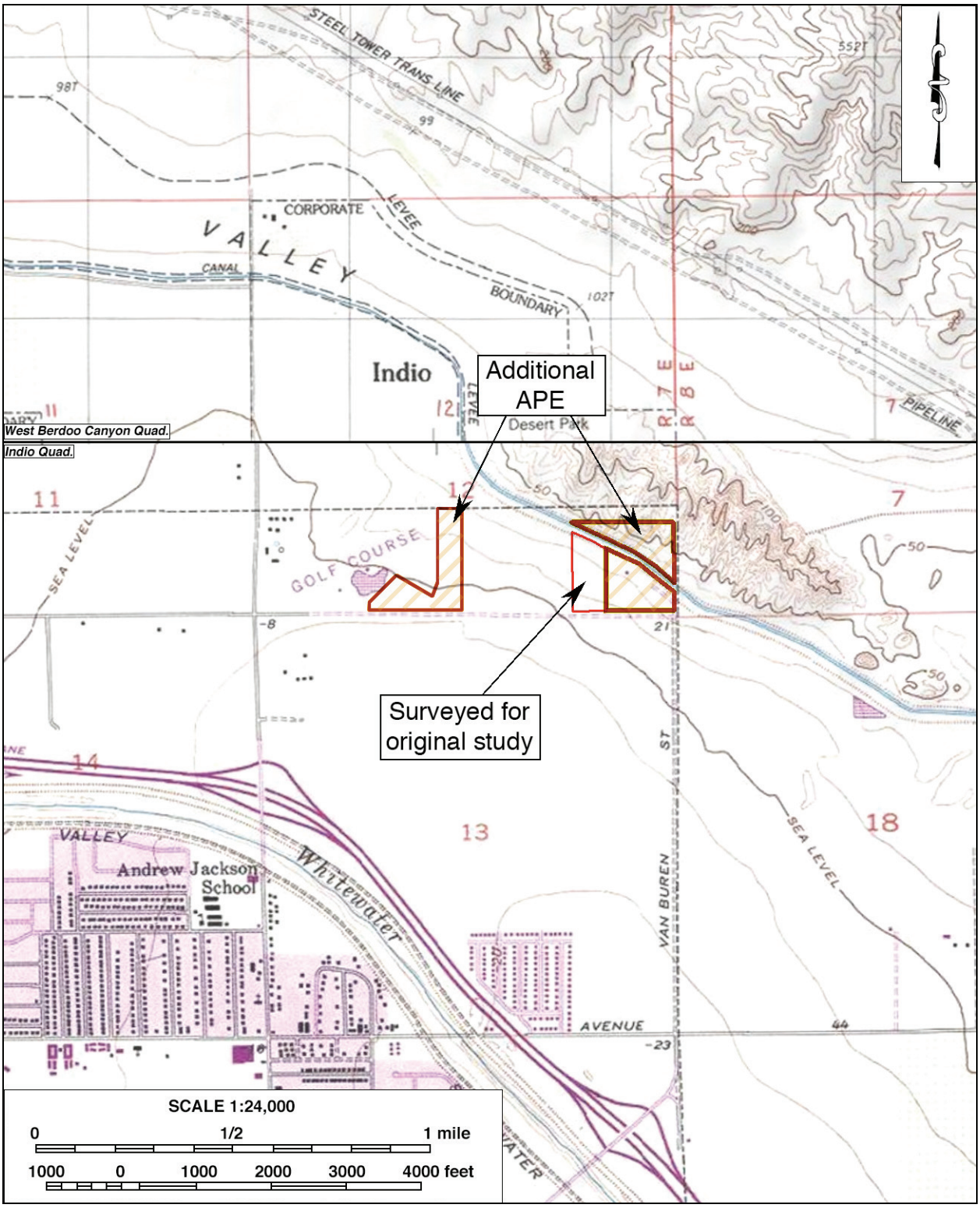


Figure 1. Additional areas of the APE covered by this addendum letter. (Based on USGS Indio and West Berdoo Canyon, Calif., 1:24,000 quadrangles)

Methods

On June 3, 2010, CRM TECH archaeologist Nina Gallardo completed the records search for the original study at the Eastern Information Center (EIC), located at the University of California, Riverside. While the additional parcels of land that are the subject of this study were within the scope of the records search, they were not specifically looked at since they were not part of the APE. Thus, because of the sensitive nature of these additional portions of the APE, Gallardo returned to the EIC on March 14, 2011, to update the data and collect specific information for the new, additional areas.

On January 31 and February 1, 2011, CRM TECH Field Director Daniel Ballester conducted an intensive-level field survey of these new portions of the APE. During the field inspection, Ballester walked north-south parallel transects spaced 15 meter (ca. 50 ft.) apart across these areas. In this way, the ground surface was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic periods (i.e., 50 years ago or older). Ground visibility was poor to good (0-85%) depending on the vegetation growth. As mentioned already, a portion of the Posse Park area had already been surveyed for the original study (Encarnación and Ballester 2010) (see Fig. 1).

Results

A review of the information from the records searches indicates that these additional areas were surveyed for cultural resources in 1998 (Love and Tang 1998). At that time numerous prehistoric archaeological sites were recorded within that study area, with a portion of two of those sites being recorded within the additional APE next to the Indio Municipal Golf Course. These sites contained pottery sherds, pieces of lithic debitage, rocks and fire-affected rocks, cores, hammerstones, pieces of groundstone, pestles, projectile points, and a possible human cremation (*ibid*.). Further document research revealed that archaeological test excavations had been conducted at these sites (Demcak 2002). As a result, the sites were determined to qualify as "historical resources" according to CEQA guidelines (*ibid*.).

In March 2003, mitigative data recovery excavations were conducted on the sites (Demcak 2003). Mitigation through data recovery lowers the impacts to a "historical resouce" to a level of less than significant by collecting, analyzing, and preserving the important data from the resource. "Data recovery," while mitigating the impacts to the archaeological resource, oftentimes results in an artifact-recovery of 10 percent or less. Thus, although a 100 percent surface collection had been completed and numerous shovel test pits and excavation units had been dug during the testing and data recovery work at the sites, not all of the cultural material had been recovered. Additionally, in this area of windswept mesquite dunes, it is not unusual for artifacts to be repeatedly uncovered and reburied over time, so the presence of artifacts at these prehistoric archaeological sites would not be surprising or extraordinary.

Besides the testing and data recovery programs that have been conducted at the sites, an archaeological monitoring program during earth-moving for the residential tract between the golf course and the park was carried out (Demcak et al. 2003). Thus,

impacts to the sites have been lessened to a level of less than significant through data recovery excavations and archaeological monitoring during earth-moving.

During the field survey of the additional areas for this study, it was noted that both of these areas had been disturbed by various activities. The area by the golf course, however, appeared to be less disturbed and more natural. No evidence of potential cultural resources, including buildings, structures, objects, sites, features, or artifacts more than 50 years of age, was encountered within the APE at Posse Park.

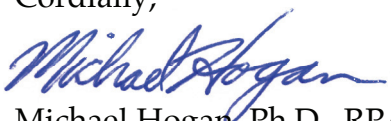
However, in that portion of the APE by the golf course, where two prehistoric archaeological sites had previously been recorded, Ballester noted the presence of prehistoric artifacts. While one grouping of artifacts appears to be completely within the boundaries of one of the sites, the other grouping of artifacts would extend the site boundaries of the other site further to the west. The artifacts that were observed include numerous ceramic potsherds (including 4 rim sherds), a groundstone fragment, a few lithic flakes, and two fire-affected rocks.

Conclusion

Based on the results of records search and field survey, the additional areas being added to the APE for satellite treatment facility sites for the Indio Water Authority Wastewater Treatment Project are highly sensitive for cultural resources. Previously, portions of two prehistoric archaeological sites had been recorded in one of these additional areas of the APE, with several other sites recorded in the area. Though archaeological testing and data recovery programs were conducted on the sites in the area, additional cultural resources are still present. Because the sites in this area have been determined to qualify as "historical resources" and because of the high potential for buried cultural deposits, including human cremations, to be found in these areas, CRM TECH recommends that an archaeological monitoring program be implemented for all earth-moving activities in these areas.

Thank you for this opportunity to be of service. If you need any further information, do not hesitate to contact our office at 909.824.6400.

Cordially,



Michael Hogan, Ph.D., RPA
Principal Investigator
CRM TECH

REFERENCES CITED

Demcak, Carol R.
2002 Report of Phase II (Test Level) Archaeological Investigations at RV Showcase Sites: CA-RIV-6052, -6053, -6054, -6055, and -6056, Indio, Riverside County, California. On file, Eastern Information Center.

Demcak, Carol R.
2003 Report of Phase III (Data Recovery) Archaeological Investigations at RV Showcase Sites, City of Indio, Riverside County, California. On file, Eastern Information Center.

Demcak, Carol R. and Chris A. Demcak and Steven A. Wakefield
2003 Report of Archaeological Monitoring Program at CA-RIV-6052, -6053, -6054, -6055, and -6056, Sandhurst Cove, Avenue 42, Indio, California. On file, Eastern Information Center.

Encarnación, Deirdre and Daniel Ballester
2010 Identification and Evaluation of Historic Properties: Indio Water Authority Wastewater Treatment Project, Cities of Indio and La Quinta, Riverside County, California. On file, Eastern Information Center and CRM TECH offices.

Love, Bruce and Bai Tom Tang
1998 Cultural Resources Report: the RV Showcase Specific Plan in the City of Indio, Riverside County, California. On file, Eastern Information Center and CRM TECH offices.

CITY OF INDIO
INDIO WATER AUTHORITY
TECHNICAL MEMORANDUM NO. 2

WATER BALANCE STUDY

DRAFT
DECEMBER 2009

Thomas Harder & Co.
Groundwater Consulting

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1.0 Introduction

This technical memorandum (TM) presents an evaluation of the water balance associated with discharge of treated wastewater from the Valley Sanitary District (VSD) wastewater treatment plant (WWTP) near Indio, California (see Figure 1). Currently, VSD discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel, which is an unlined drainage that eventually discharges into the Salton Sea, located approximately 13 miles downstream. The Indio Water Authority (IWA) proposes to divert a portion of the VSD's discharge from the river channel for beneficial uses within their service area.

1.1 Purpose and Scope

The purpose of this TM is to present an evaluation of potential impacts to the surface water hydrology and groundwater environment if a portion of the water currently discharged to the Coachella Valley Stormwater Channel is diverted for other uses. The area of the investigation (hereafter referred to as the "Study Area") extends from the City of Indio to the Salton Sea (see Figure 1).

The scope of work to address the objective of the investigation included:

- A review of water resource reports, hydrogeological data and historical wastewater discharge data for the Indio area;
- An evaluation of the current water balance for the wastewater discharge; and
- An analysis of potential changes in the water balance if the discharge is diverted

1.2 Sources of Data

- VSD monitoring records and reports
- United States Geological Survey (USGS) stream gage data
- California Irrigation Management Information System (CIMIS) weather station data
- IWA reports and well records

A complete list of references is provided at the end of this TM.

Indio Water Authority

22-Dec-09

0 1.5 3 Miles

NAD 27 UTM Zone 11 N.
Central Meridian: -117

N

Thomas Harder & Co.
Groundwater Consulting

Recycled Water Diversion - Water Balance Study

Map Features

- Valley Sanitary District Wastewater Treatment Facility
- Other Wastewater Treatment Facilities
- USGS Stream Gage
- Coachella Valley Stormwater Channel
- Interstate Highway
- US Highway
- CA State Highway

Area Setting

DRAFT

Study Area
Figure 1

2.0 Study Area Setting

The Study Area is located within the southern portion of the Coachella Valley of south central Riverside County, California (see Figures 1 and 2). The Coachella Valley is an elongated northwest/southeast trending lowland area that represents the landward extension of the Gulf of California. In the Study Area, the valley is bound on the northeast by the Little San Bernardino Mountains and Mecca Hills and on the southwest by the Santa Rosa Mountains (see Figure 1). The climate of this area is typical of the desert with average annual precipitation of approximately 3 inches/yr (National Climate Data Center, 2009) and an evapotranspiration rate of greater than 70 inches/yr (CIMIS, 2009).

2.1 Surface Water

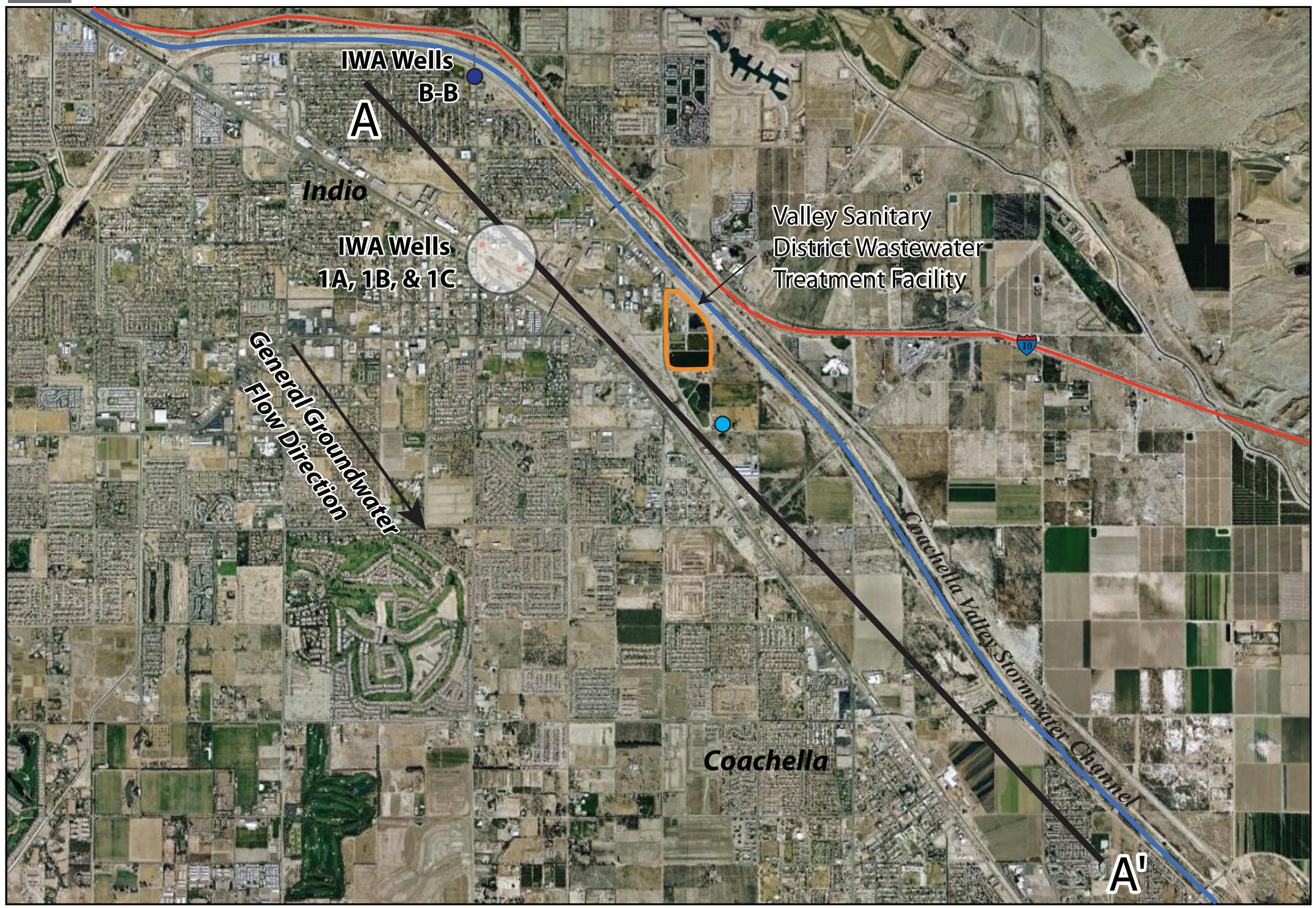
The primary surface water feature draining the area is the Coachella Valley Stormwater Channel, which originates in the southern San Bernardino Mountains at the north end of the valley and drains through the Study Area to the Salton Sea. The channel is dry most of the time, flowing only during the rainy season and during periods of prolonged precipitation. South of Indio, surface flow in the channel is primarily from treated wastewater discharge and agricultural irrigation return flow. Average annual surface water flow at the United States Geological Survey (USGS) stream gage at Indio (located approximately 1.5 miles upstream of the VSD point of discharge to the channel; see Figure 1) is approximately 2,700 acre-ft/yr (USGS, 2009). Average annual surface water flow at the USGS stream gage immediately north of the Salton Sea is approximately 79,000 acre-ft/yr (Tetra Tech, 2000). The increase in downstream surface flow in the channel will be discussed later in this TM.

2.2 Geology

The Coachella Valley is a fault bounded lowland depression that represents the northern extension of the Salton Trough. The most prominent fault in the Study Area is the San Andreas Fault Zone, which trends in a northeast-southwest direction through the north-central portion of the valley. The mountains surrounding the valley consist primarily of pre-Tertiary igneous and metamorphic rock. Rapid subsidence of the valley floor during geologic time (last 12 million years; Sneed and Brandt, 2007) and subsequent sedimentation has resulted in the alluvial basin that exists today. The maximum depth of alluvial sediments has been estimated to be

Indio Water Authority

22-Dec-09



0 1.5 3 Miles

NAD 27 UTM Zone 11 N.
Central Meridian: -117

N

Thomas Harder & Co.
Groundwater Consulting

Recycled Water Diversion - Water Balance Study

Map Features

- Municipal Well
- Private Well
- Interstate Highway
- Valley Sanitary District Wastewater Treatment Facility
- Coachella Valley Stormwater Channel
- Cross Section A - A' (see Figure 3)

Area Setting

DRAFT

Detailed Study Area

Figure 2

approximately 12,000 ft although only the upper approximately 2,000 ft of sediments are water-bearing (DWR, 1979).

2.3 Hydrogeology

The Study Area is located within the Indio Subbasin of the regional Coachella Valley Groundwater Basin (DWR, 2003). The southern portion of the Indio Subbasin (i.e. the Study Area) has also been referred to as the Lower Whitewater River Subbasin (CVWD, 2005). In general, the aquifer system in the Lower Whitewater River Subbasin consists of alluvial fan deposits interbedded with lacustrine sediments consisting of thick layers of relatively impermeable clay and silt. Three principal aquifers have been identified in the Study Area: a shallow semiperched aquifer, an upper aquifer, and a lower aquifer (see Figure 3). The upper and lower aquifers are separated by a confining layer of clay and silt (i.e. aquitard) that is approximately 100 ft thick in the Indio area.

Historical groundwater elevation contour maps show groundwater flowing in a southeasterly direction in approximately the same direction as surface flow in the Coachella Valley Stormwater Channel (Huberty, Pillsbury and Sokoloff, 1948; Moreland, 1975). Groundwater levels directly beneath the VSD treatment plant, which are attributed to the semi-perched aquifer, are between 40 and 60 ft below ground surface (bgs) (Leighton Consulting, Inc., 2006). Groundwater levels in the upper aquifer are generally between approximately 90 and 100 ft bgs (Sneed and Brandt, 2007). Groundwater levels in the lower aquifer are reported to be 20 to 40 ft deeper than the upper aquifer (Moreland, 1975). For both the upper and lower aquifer, groundwater levels are declining at a similar rate of 0.5 to 1.5 ft per year.

Average annual natural groundwater recharge to the Indio Subbasin has been estimated to be approximately 49,000 acre-ft/yr (Black & Veatch, 2008).

Groundwater quality in the upper aquifer in the Indio area has been impacted by historical land use but is generally suitable for use as a source of municipal water supply (see Table 1). Total dissolved solids (TDS) concentrations in this aquifer generally range from 200 to 600 milligrams per liter (mg/L). The maximum contaminant level (MCL) for TDS is 500 mg/L. Nitrate concentrations in this aquifer generally range from 0.2 to 1.3 mg/L (as nitrogen) although concentrations as high as 6 mg/L have been detected in some wells. The MCL for nitrate is 10 mg/L. By comparison, TDS concentrations in the lower aquifer are generally 200 mg/L or

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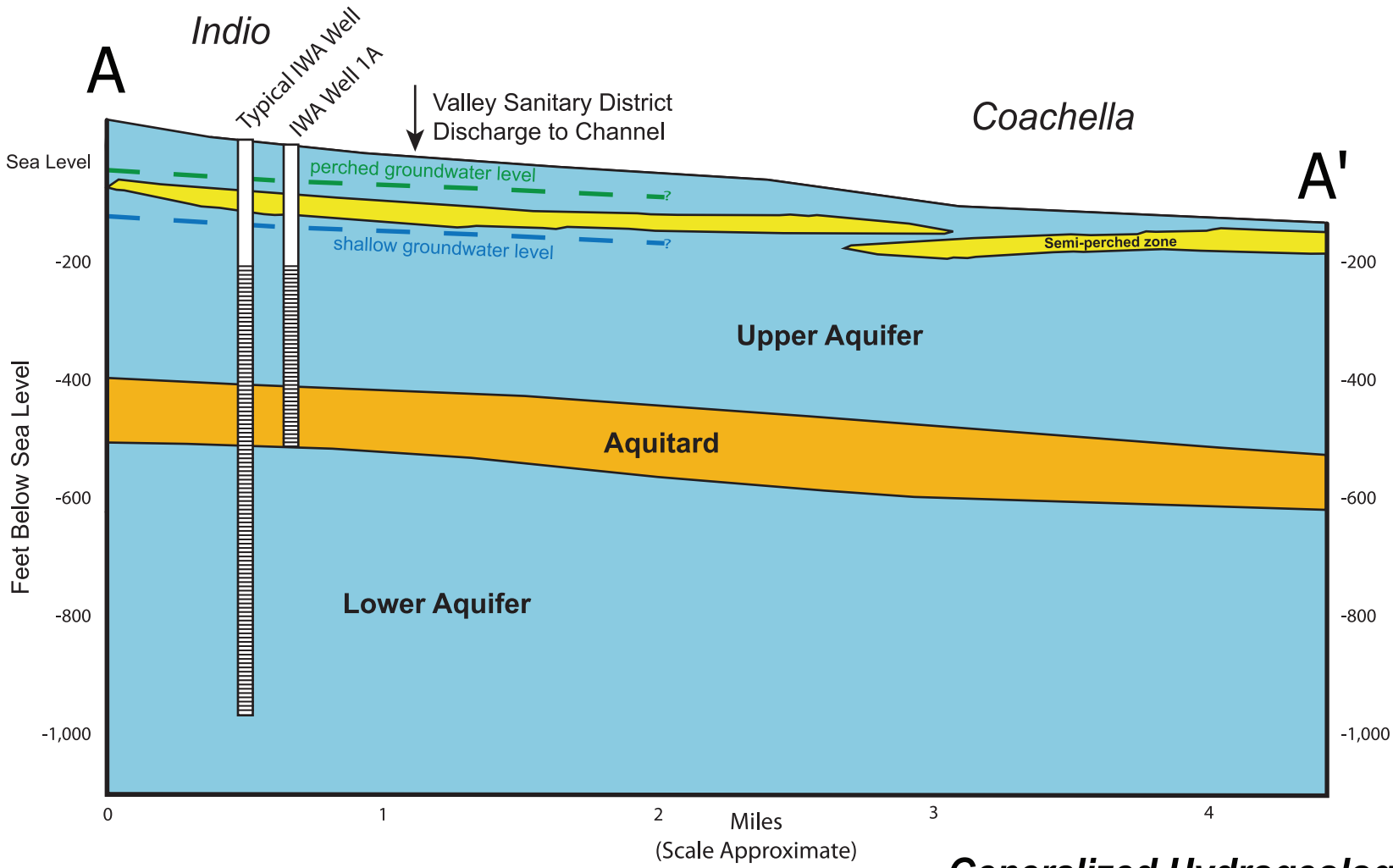
Recycled Water Diversion - Water Balance Study

Indio Water Authority



Generalized Hydrogeologic Cross Section

Figure 3

Thomas Harder & Co.
Groundwater Consulting

Upper Aquifer Groundwater Quality

Date	Upgradient IWA Wells						Downgradient Private Well	
	Well 1A		Well 1B		Well 1C			
	Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	TDS (mg/L)
Mar-86	1.58	225	0.68	220	0.45	190	na	na
Jul-87	0.23	na	1.13	na	na	na	na	na
Jul-89	0.23	250	0.68	335	0.23	220	na	na
Feb-92	0.68	241.4	0.99	281.6	0.81	187	na	na
Mar-95	1.13	345	0.68	425	0.68	240	na	na
Feb-98	0.56	304	0.79	275	0.85	239	na	na
May-01	0.9	390	0.9	240	0.9	260	na	na
Apr-02	0.79	na	1.08	na	1.02	na	na	na
Dec-02	0.52	na	1.08	na	0.97	na	na	na
Mar-04	0.55	360	0.84	270	0.95	290	na	na
Sep-04	0.82	430	1.19	600	0.99	280	na	na
Sep-05	0.84	na	0.99	na	0.99	na	na	na
Jan-06	1.2	na	1.33	504	1.2	na	na	na
Sep-06	na	na	1.29	na	0.97	286	na	na
Sep-07	na	na	1.08	432	0.86	292	na	na
Oct-08	na	na	1.08	na	0.9	na	0.36	237
Jul-08	na	na	na	na	na	na	0.36	221
Apr-08	na	na	na	na	na	na	0.38	200
Jan-08	na	na	na	na	na	na	0.36	456
Apr-09	na	na	na	na	na	na	0.34	226
Jan-09	na	na	na	na	na	na	0.36	239

Notes:
na = data not available
TDS = total dissolved solids
mg/L = milligrams per liter

less and nitrate concentrations are less than 1.5 mg/L. Elevated TDS and nitrate concentrations in the upper aquifer are attributed to historical agricultural land use in the area (Moreland, 1975).

TDS and nitrate concentrations in groundwater from a private well near the VSD wastewater treatment plant (WWTP) does not show evidence of impact from groundwater recharge associated with discharge of treated wastewater to the Coachella Valley Stormwater Channel. This well is completed within the upper aquifer and is located directly downgradient of the treatment facility (see Figure 2). TDS concentrations in water from this well generally range from 200 to 240 mg/L. Nitrate concentrations range from 0.34 to 0.36 mg/L. These concentrations are below TDS and nitrate concentrations measured in the discharge to the river channel (see Section 4.3), and suggest that groundwater recharge from beneath the channel is minimal in the vicinity of the WWTP.

3.0 Components of Surface Water Flow in the Coachella Valley Stormwater Channel Channel

There are multiple sources of surface water flow within the Coachella Valley Stormwater Channel between Indio and the Salton Sea. In addition to natural stormwater runoff, the river receives inflow from discharge from two wastewater treatment plants and irrigation return flow via agricultural drains.

Historical surface water flow in the Study Area portion of the Coachella Valley Stormwater Channel has been recorded from USGS stream gages at Indio and near the Salton Sea (see Figure 1). Surface water flow through the USGS stream gage at Indio (located approximately two miles upstream of the VSD point of discharge) averages approximately 2,700 acre-ft/yr, based on stream flow records for the period 1967 to 2008 (USGS, 2009). The Coachella Valley Stormwater Channel between this stream gage and the VSD point of discharge is usually dry and the flow through the gage is likely attributed to stormwater runoff. Surface water flow at the USGS station near the Salton Sea (approximately 13 miles downstream of the VSD point of discharge) averages approximately 79,000 acre-ft/yr (Tetra Tech, 2000).

3.1 Wastewater Discharge

Discharge of treated wastewater into the Coachella Valley Stormwater Channel occurs at two locations within the Study Area: the VSD WWTP near Indio and the Coachella Valley Water District (CVWD) WWTP near Thermal. In 2008, the VSD discharged approximately 7,000 acre-ft to the river channel at their point of discharge near Indio (see Tables 2 and 3). The CVWD WWTP near Thermal generates more than 5,000 acre-ft/yr of treated wastewater although it is reported that most of this water is recycled for other uses (Black & Veatch, 2008). Thus, the total wastewater discharge to the Coachella Valley Stormwater Channel ranges from 7,000 to 12,000 acre-ft/yr, depending on how much water CVWD diverts for other uses.

3.2 Agricultural Irrigation Return Flow

The most significant source of flow in the Coachella Valley Stormwater Channel between Indio and the Salton Sea occurs as irrigation return flow via agricultural drains along the river channel. Given the large discrepancy between the total contributions of surface water flow from

Components of Surface Water Flow in the Coachella Valley Stormwater Channel

Source	Flow (acre-ft)
Total Average Annual Flow Upstream of VSD Discharge[1]	2,700
VSD WWTP Discharge (2008)	7,000
Coachella Valley Water District WWTP (2004)	5,300
Agricultural Drains	na
Total Average Annual Whitewater River Discharge to Salton Sea[2]	79,000

Notes:
na = data not available
VSD = Valley Sanitary District
WWTP = Wastewater Treatment Plant
[1] USGS Stream Gage 10259300 Whitewater River at Indio
[2] USGS Stream Gage 10259540 Whitewater River near Mecca

Monthly and Average Daily Discharge to the Coachella Valley Stormwater Channel
Valley Sanitary District Wastewater Treatment Plant

Year	Month	Activated Sludge Process		Oxidation Pond/Wetland Process		Total Discharge		Annual Total (acre-ft)
		Monthly Discharge (mg)	Average Daily Discharge (mgd)	Monthly Discharge (mg)	Average Daily Discharge (mgd)	Total Monthly Discharge (mg)	Average Daily Discharge (mgd)	
2008	Jan	129.7	4.18	83.56	2.70	213	6.88	7,026
	Feb	110.9	3.96	80.75	2.88	192	6.84	
	Mar	116.6	3.76	57.604	1.86	174	5.62	
	Apr	129.1	4.30	39.015	1.30	168	5.60	
	May	143.9	4.64	44.624	1.44	189	6.08	
	Jun	147.5	4.92	37.612	1.25	185	6.17	
	Jul	136.2	4.39	54.655	1.76	191	6.16	
	Aug	134.3	4.33	58.64	1.89	193	6.22	
	Sep	136.8	4.56	44.048	1.47	181	6.03	
	Oct	139.3	4.49	56.439	1.82	196	6.31	
	Nov	141.74	4.72	56.12	1.87	198	6.60	
	Dec	147.3	4.75	62.23	2.01	210	6.76	
2009	Jan	147.7	4.76	64.02	2.07	212	6.83	
	Feb	137.6	4.91	56.46	2.02	194	6.93	
	Mar	151.2	4.88	46.281	1.49	197	6.37	
	Apr	142.5	4.75	37.834	1.26	180	6.01	
	May	147.6	4.76	30.885	1.00	178	5.76	
	Jun	144.9	4.83	24.782	0.83	170	5.66	
	Jul	151.96	4.90	33.928	1.09	186	6.00	
	Aug	146.66	4.73	34.848	1.12	182	5.86	

Notes:
mg = million gallons
mgd = million gallons per day

stormwater runoff and treated wastewater discharges (up to approximately 15,000 acre-ft/yr) and the total flow measured at the stream gage near the Salton Sea (average of 79,000 acre-ft/yr), it is likely that agricultural return flow is the dominant source of discharge to the river downstream of Indio.

3.3 Evapotranspiration Losses along the Coachella Valley Stormwater Channel

Although the evapotranspiration (ET) rate in the Study Area is very high, the total loss of water from the channel is a relatively minor component of the overall water balance of the Coachella Valley Stormwater Channel. As described earlier, the ET rate in the Study Area is approximately 70 inches/yr, based on data from a CIMIS station in Indio (CIMIS, 2009). When this ET rate is applied to the approximate riparian area of the Coachella Valley Stormwater Channel, which is estimated to cover approximately 370 acres between the VSD point of discharge and the Salton Sea, the resulting ET loss from surface water is approximately 2,200 acre-ft/yr. This represents approximately three percent of the total surface water flow to the Salton Sea via the Coachella Valley Stormwater Channel.

3.4 Potential Groundwater Recharge from VSD Discharge to the Coachella Valley Stormwater Channel

Recharge of the aquifer system from surface water flow associated with VSD discharges to the Coachella Valley Stormwater Channel is also expected to be a minor component of the overall water balance. Infiltration rates beneath ephemeral stream channels in desert environments have been estimated to range from 0.0002 to 0.001 ft/day (Stonestrom et al., 2003). However, in the case of the Coachella Valley Stormwater Channel, estimated infiltration is complicated by the fact that the channel is flowing perennially and has become vegetated. Infiltration beneath the channel is expected to be higher than an ephemeral stream because it is flowing. However, the permeability of the channel bottom is also expected to be reduced from vegetation buildup (Blasch and Ferre, 2004), as is the case with the channel downstream of the VSD point of discharge. Assuming infiltration rates ranging from 0.1 to 0.5 ft/day and an effective channel area along a 1.5 mile reach of the river directly downstream of the VSD point of discharge, the amount of groundwater recharge beneath the channel associated with VSD discharges would

range from approximately 3 to 16 acre-ft/yr. These estimates of groundwater recharge are less than one percent of the total VSD WWTP discharge to the channel (7,000 acre-ft/yr).

4.0 Potential Hydrological and Hydrogeological Impacts from Reducing VSD Discharge to the Coachella Valley Stormwater Channel

4.1 Potential Changes in Surface Water Flow

The greatest impact to surface water flow in the Coachella Valley Stormwater Channel from reducing VSD discharges to the channel would likely be limited to the reach of the channel directly downgradient of the VSD point of discharge. With increasing distance downstream, inflow contributions from agricultural irrigation return flow become the dominant contribution of flow to the channel. The available data does not allow for a detailed accounting of return flow accumulation. However, based on review of aerial photos showing irrigated fields along the channel, there are likely irrigation return flow contributions as close as 1.5 miles downstream of the VSD point of discharge. Thus, the greatest impact to surface water flow in the Coachella Valley Stormwater Channel from reductions in VSD discharges would be in the 1.5 mile reach downstream of the point of discharge.

4.2 Potential Changes in Groundwater Recharge

Diverting VSD treated wastewater discharge from the Coachella Valley Stormwater Channel for other beneficial uses in the Indio area would not have an adverse impact on the groundwater resources of the area. In the event that all of the VSD discharge was diverted for other uses, the maximum reduction in groundwater recharge is estimated to be on the order of 16 acre-ft/yr, which is a fraction of the estimated natural recharge to the Indio Subbasin (49,000 acre-ft/yr). However, irrigation uses for the diverted water would result in return flow to the groundwater, which would offset the groundwater recharge beneath the channel and, in some cases, could exceed the current groundwater recharge. Also, if the recycled water is used for artificial recharge in engineered and maintained surface spreading basins, most of the VSD recycled water would recharge the groundwater substantially increasing the groundwater resources of the Indio Area.

4.3 Potential Changes in Groundwater Quality

TDS and nitrate concentrations in treated wastewater from the VSD WWTP are not significantly higher than concentrations of these constituents in the shallow groundwater in the Indio area (see Table 4). Based on observations of TDS and nitrate concentrations in the private well immediately downgradient of the treatment facility, there is no evidence that current discharges are adversely impacting the groundwater quality, which is consistent with the low estimates of groundwater recharge. Thus, reducing or eliminating VSD discharges to the Coachella Valley Stormwater Channel is not expected to impact the quality of groundwater in the area.

4.4 Potential Changes in Surface Water Flow to the Salton Sea

Reducing or eliminating VSD flow contributions to the Coachella Valley Stormwater Channel would have a negligible impact on inflow to the Salton Sea. The 79,000 acre-ft/yr of Coachella Valley Stormwater Channel flow to the Salton Sea accounts for approximately six percent of the total inflow to this water body, which is estimated to be 1,346,000 acre-ft/yr (Tetra Tech, 2000). Accounting for losses due to ET, the 7,000 acre-ft/yr of discharge to the channel is expected to be six to eight percent of the total Coachella Valley Stormwater Channel discharge to the Salton Sea and accounts for less than one half of one percent of the total inflow to the Salton Sea.

Valley Sanitary District Wastewater Treatment Plant Water Quality

Year	Month	Representative Sample From Combined Discharge		Upstream Receiving Water Monitoring	Downstream Receiving Water Monitoring
		Nitrate as N (mg/L)	TDS (mg/L)	Nitrate as N (mg/L)	Nitrate. as N (mg/L)
2008	Jan	1.4	450	No upstream flow	1.8
	Feb	2.5	462		2.3
	Mar	1.1	456		1.4
	Apr	1.9	429		0.2
	May	0.7	476		0.14
	Jun	0.5	462		0.18
	Jul	nd	483		nd
	Aug	0.16	455		nd
	Sep	1.3	476		nd
	Oct	nd	409		nd
	Nov	0.43	446		0.18
	Dec	3.4	455		2.3
2009	Jan	3.4	455		2.9
	Feb	1.4	435		0.79
	Mar	4.7	454		4
	Apr	1.4	442		0.88
	May	1.5	444		0.99
	Jun	0.14	434		nd
	Jul	nd	483		nd
	Aug	nd	383		0.27

Notes:
nd = nondetect
mg/L = milligrams per liter

5.0 Summary and Conclusions

Based on the data and analysis presented in this TM, the following conclusions have been reached:

- The VSD currently discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel near Indio;
- The VSD discharge to the channel is one of numerous flow contributions to the channel, which include stormwater runoff, other treated wastewater discharges, and irrigation return flow from agriculture;
- By process of elimination, agricultural irrigation return flow appears to be the greatest contribution of flow to the Coachella Valley Stormwater Channel between Indio and the Salton Sea;
- The first observable irrigation return flow to the channel occurs approximately 1.5 miles downstream of the VSD point of discharge;
- Groundwater recharge beneath the Coachella Valley Stormwater Channel that is attributable to VSD discharges is estimated to range from approximately 3 to 16 acre-ft/yr;
- The greatest impact to surface water flow in the Coachella Valley Stormwater Channel would be in the first 1.5 miles downstream of the VSD point of discharge;
- Diverting VSD discharge from the Coachella Valley Stormwater Channel for other beneficial uses in the Indio area would not have an adverse impact on the groundwater resources of the area;
- Reducing or eliminating VSD discharges to the Coachella Valley Stormwater Channel is not expected to impact the quality of groundwater in the Indio area; and
- Reducing or eliminating VSD flow contributions to the Coachella Valley Stormwater Channel would have a negligible impact on inflow to the Salton Sea.

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Evaluation of Potential Groundwater Impacts

Indio Water Authority Recycled Water Program

March 9, 2011

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1 Executive Summary

The Indio Water Authority (IWA) is proposing to use treated wastewater from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) near Indio, California for beneficial uses within their service area. Currently, VSD discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel, which is an unlined drainage that eventually discharges into the Salton Sea, located approximately 13 miles downstream. The proposed project, referred to as the IWA Recycled Water Program (the Project) as described in Tom Dodson & Associates (2010), would include diversion of a portion of the VSD discharges for irrigation use and possible artificial recharge of the groundwater system.

The purpose of this study is to document potential changes in hydrology and water quality that would be associated with artificial recharge of the groundwater system in the Indio area with recycled water from the VSD WWTP. Specifically, the study addresses:

1. Potential changes in groundwater levels that could be expected from artificial recharge;
2. Regulatory requirements for the recharge of recycled water; and
3. Potential changes in groundwater quality that could be expected from artificial recharge given the treatment methods proposed for the recycled water.

The Project Area is located within the southern portion of the Indio Subbasin of the regional Coachella Valley Groundwater Basin. Three principal aquifers have been identified in the Project Area: a shallow semiperched aquifer, an upper aquifer, and a lower aquifer. The upper and lower aquifers are separated by a confining layer of clay and silt (i.e. aquitard) that is approximately 100 ft thick in the Indio area. The IWA currently meets municipal and industrial water demand (approximately 23,000 acre-ft/yr) through groundwater pumping from 18 production wells. Most of the production occurs in the lower aquifer. For both the upper and lower aquifer, groundwater levels are declining at a similar rate of 0.5 to 1.5 ft per year, which is a result of the overdraft of the groundwater basin.

The existing groundwater quality of both the upper and lower aquifers meets regulatory requirements for use as municipal supply. Total dissolved solids (TDS) concentrations are typically less than 300 milligrams per liter (mg/L) and nitrate concentrations (as nitrogen) are typically less than 5 mg/L (the Maximum Contaminant Level is 10 mg/L).

The Project would include diversion of up to 3.3 million gallons per day (MGD) (3,698 acre-ft/yr) of recycled water from the VSD WWTP for use as irrigation water and/or artificial recharge of the groundwater system. Conceptual Project features include distribution pipelines

and up to four injection wells. Injection wells have been proposed to enable artificial recharge of the lower aquifer system, where most of IWA's wells are perforated.

Analysis of potential changes in groundwater levels associated with the artificial recharge of 3.3 MGD of recycled water at the four injection wells was conducted using WinFlow, an analytical model code that simulates steady-state groundwater flow in two dimensions. Analysis of potential water quality changes was conducted in the context of Federal, State and Regional water quality regulations. The findings from the analysis are as follows:

- The results of the analysis of groundwater level impacts shows a maximum positive change (i.e. rise) of approximately 3.5 ft in the immediate vicinity of the injection wells;
- Potential changes in groundwater levels at other area wells would range from less than 1 ft to approximately 3 ft;
- Positive changes in groundwater levels are considered a benefit in that they help mitigate the effects of regional overdraft in the aquifer system;
- Evaluation of potential groundwater quality impacts from the artificial recharge of recycled water are based on advanced treatment of the recycled water, which results in a recycled water quality that is superior to that of the native groundwater;
- Using advanced treated recycled water, the artificial recharge program does not violate Federal and State anti-degradation policy and meets the requirements of the Regional Water Quality Control Board's (RWQCB's) Water Quality Control Plan;
- Implementation of the recycled water recharge project would include certain requirements from the California Department of Health (DPH), including a public hearing process, development of both operation plans and engineering reports, blending water requirements (initially the injection water must be a 50:50 blend of recycled water and water from another approved source), and monitoring and reporting; and
- Analysis of potential recycled water travel times at the proposed injection well locations shows that the injected water would not reach any existing production wells within two years of introduction into the aquifer, thus satisfying DPH requirements for initial siting of injection wells.

2 Introduction

The Indio Water Authority (IWA) is proposing to use treated wastewater from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) near Indio, California for beneficial uses within their service area. Currently, VSD discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel, which is an unlined drainage that eventually discharges into the Salton Sea, located approximately 13 miles downstream. The proposed project, referred to as the IWA Recycled Water Program (the Project) as described in Tom Dodson & Associates (2010), would include diversion of a portion of the VSD discharges for irrigation use and possible artificial recharge of the groundwater system.

The Project Description, as described in the Initial Study (Tom Dodson & Associates, 2010), indicates that the amount of recycled water currently available for beneficial uses is approximately 3.3 million gallons per day (MGD). As the amount of recycled water available for reuse is significantly less than the potential irrigation demand for the area (Carollo Engineers, 2010), it is anticipated that most of the diverted VSD water will be used for irrigation purposes. However, irrigation demand is seasonal and it is proposed to use recycled water available during periods of low demand for artificial recharge of the groundwater system.

2.1 Purpose and Scope of this Study

The purpose of this study is to document potential changes in hydrology and water quality that would be associated with artificial recharge of the groundwater system in the Indio area with recycled water from the VSD WWTP. Specifically, the study addresses:

4. Potential changes in groundwater levels that could be expected from artificial recharge;
5. Regulatory requirements for the recharge of recycled water; and
6. Potential changes in groundwater quality that could be expected from artificial recharge given the treatment methods proposed for the recycled water.

2.2 Project Area Location

The Project Area includes the general vicinity of Indio, California as shown on Figure 1. This includes the VSD WWTP and Posse Park on the east, Bermuda Dunes on the north, Palm Desert and Eisenhower Mountain on the west, and 50th Avenue on the south. The Project Area was

selected to encompass all proposed project features, as described later in this report, and enable the evaluation of potential changes in regional groundwater flow patterns and groundwater quality.

2.3 Sources of Data

Sources of data used in the analysis included the following:

- Data, files and reports provided by IWA, including well records, driller's logs, groundwater levels, groundwater quality and pumping data;
- Data provided by the Coachella Valley Water District, including groundwater levels, pumping test data, and well locations;
- WWTP water quality from VSD;
- Regulatory requirements for artificial recharge from the California Department of Public Health; and
- Groundwater quality criteria from the Regional Water Quality Control Board – Colorado River Basin.

A complete list of references is provided Section 8.

3 Physical Setting of the Project

The Project Area is located within the southern portion of the Coachella Valley of south central Riverside County, California (see Figures 1 and 2). The Coachella Valley is an elongated northwest/southeast trending lowland area that represents the landward extension of the Gulf of California. In the Project Area, the valley is bound on the northeast by the Little San Bernardino Mountains and the Mecca Hills and on the southwest by the Santa Rosa Mountains (see Figure 1). The climate of this area is typical of the desert with average annual precipitation of approximately 3 inches/yr (National Climate Data Center, 2009) and an evapotranspiration rate of greater than 70 inches/yr (CIMIS, 2009).

3.1 Hydrology

The primary surface water feature draining the Project Area is the Coachella Valley Stormwater Channel, which originates in the southern San Bernardino Mountains at the north end of the valley and drains through the Project Area to the Salton Sea. The channel is dry most of the time, flowing only during the rainy season and during periods of prolonged precipitation. South of Indio, surface flow in the channel is primarily from treated wastewater discharge and agricultural irrigation return flow. Average annual surface water flow at the United States Geological Survey (USGS) stream gage at Indio (located approximately 1.5 miles upstream of the VSD point of discharge to the channel; see Figure 2) is approximately 2,700 acre-ft/yr (USGS, 2009).

3.2 Geology

The Coachella Valley is a fault bounded lowland depression that represents the northern extension of the Salton Trough. The most prominent fault in the Project Area is the San Andreas Fault Zone, which trends in a northeast-southwest direction through the north-central portion of the valley. The mountains on the west side of the valley consist primarily of pre-Tertiary igneous and metamorphic rock. The Mecca Hills that bound the valley on the east side consist of consolidated Tertiary sedimentary rocks. Rapid subsidence of the valley floor during geologic time (last 12 million years; Sneed and Brandt, 2007) and subsequent sedimentation has resulted in the alluvial basin that exists today. The maximum depth of alluvial sediments has been estimated to be approximately 12,000 ft although only the upper approximately 2,000 ft of sediments are water-bearing (DWR, 1979).

The surface geology of the Project Area is characterized by an alluvial filled basin surrounded by mountains consisting of granitic, metamorphic and localized sedimentary rocks. The subsurface alluvial sediments are highly stratified with alternating layers of more permeable sand and gravel with fine-grained silt and clay (see Figure 3). The interbedded nature of the sediments is, in part, associated with historical periods when the Colorado River would flood the Salton Trough, depositing layers of silt and clay. Significant subsurface alluvial units, in order of youngest to oldest, are as follows:

Younger Deposits – Late Pleistocene to Holocene unconsolidated alluvial fan, lake, stream and sand dune deposits that consist of sand, gravel, silt and clay. Sediments range in depth from 0 to 300 ft and, where saturated, make up the upper aquifer system.

Ocotillo Conglomerate – Late Pleistocene alluvial fan and debris flows composed mainly of unconsolidated coarse sand and gravel with minor interbedded silt and clay (DWR, 1964). The sand and gravel layers of the Ocotillo Conglomerate form the lower aquifer system, which is the primary groundwater production aquifer for the Indio area. The one exception to the lithology in this unit is a silt and clay layer in the uppermost portion that forms an aquitard which separates the upper aquifer from the lower aquifer. The aquitard is as much as 100 ft thick in the Indio area.

Consolidated rocks that form the mountains and hills surrounding the Project Area have been described as follows:

Quaternary and Tertiary Sedimentary Deposits – Outcrops of Late-Tertiary and Quaternary sedimentary units make up the Indio and Mecca Hills at the eastern edge of the Project Area and presumably at depth below the Ocotillo Conglomerate. Named units include the Palm Springs, Borrego, and Canebrake formations.

Basement Complex – Pre-Tertiary consolidated rocks consisting primarily of Precambrian metamorphic rocks intruded by Cretaceous granitic rocks of the southern California Batholith (DWR, 1964).

The most significant fault in the Project Area is the San Andreas Fault Zone, which trends northwest-southeast along the northeast portion of the Project Area (see Figure 1). Individual branches within the fault zone include the Banning Fault and the Mission Creek Fault (Yule and Sieh, 2003). These are northwest-southeast trending right-lateral strike-slip faults that transfer slip between the North American and Pacific tectonic plates and act as groundwater flow barriers (DWR, 2003).

3.3 Hydrogeology

The Project Area is located within the southern portion of the Indio Subbasin of the regional Coachella Valley Groundwater Basin (DWR, 2003). The southern portion of the Indio Subbasin (i.e. from Indio to the Salton Sea) is referred to in this report as the Lower Coachella Valley. Three principal aquifers have been identified in the Project Area: a shallow semiperched aquifer, an upper aquifer, and a lower aquifer. The upper and lower aquifers are separated by a confining layer of clay and silt (i.e. aquitard) that is approximately 100 ft thick in the Indio area (see Figure 3). The top of this lower permeable zone occurs from approximately 300 to 400 ft bgs. The lower aquifer occurs within the Ocotillo Conglomerate.

3.3.1 Groundwater Recharge

The Indio Subbasin receives groundwater recharge from multiple sources, including natural recharge from precipitation, return flow recharge from irrigation, and subsurface inflow from the upper portion of the Coachella Valley. Average annual natural recharge to the Coachella Valley as a whole has been estimated as approximately 49,000 acre-ft/yr (CVWD, 2002). Of this natural recharge, only a small percentage directly recharges the Lower Coachella Valley due to its low elevation and limited precipitation. The primary source of groundwater recharge in the Lower Coachella Valley is from golf course and agricultural return flows, which contribute more than 100,000 acre-ft/yr to the groundwater system (CVWD, 2002). Subsurface inflow accounts for 30,000 acre-ft/yr to the groundwater system.

3.3.2 Groundwater Discharge

The primary source of groundwater discharge from the Lower Coachella Valley is groundwater pumping from wells. The locations of municipal wells in the Project Area are shown on Figure 2. The IWA currently meets municipal and industrial water demand through groundwater pumping from 18 production wells (see Table 1). With the exception of Wells 1B and 1C, all groundwater pumping is from the lower aquifer. Annual IWA water demand is approximately 23,000 acre-ft/yr (IWA, 2009).

In addition to IWA pumping, the CVWD pumps groundwater from wells within the Project Area (see Figure 2). Other sources of groundwater discharge in the area are through discharges to agricultural drains and evapotranspiration. Groundwater discharge in the Lower Coachella Valley exceeds the recharge, resulting in an overdraft condition with an average annual decrease in groundwater storage of approximately 42,000 acre-ft/yr (CVWD, 2002).

3.3.3 Groundwater Flow

In general, groundwater in the Project Area flows in a southeasterly direction (see Figure 4). In the south central portion of the Project Area, a localized groundwater pumping depression has developed where a number of municipal wells are located in close proximity (IWA Well T and CVWD Wells 5716-1, 5717-1, and 5713-1). Groundwater flow is more southerly to the east of these wells.

3.3.4 Historical Groundwater Levels

Groundwater levels in the Project Area vary in depth depending on the aquifer in which they are measured. Shallow groundwater levels measured in boreholes drilled in the vicinity of the VSD wastewater treatment plant occur between 40 and 60 ft below ground surface (bgs) and are attributed to the semi-perched aquifer (Leighton Consulting, Inc., 2006). Groundwater levels in the upper aquifer have historically been between approximately 90 and 100 ft bgs (Sneed and Brandt, 2007). Groundwater levels in IWA Wells 1B and 1C, which are partially perforated in the upper aquifer, are approximately 64 ft bgs (see Table 2). Groundwater levels in the lower aquifer are approximately 60 to 100 ft deeper than the upper aquifer. For both the upper and lower aquifer, groundwater levels are declining at a similar rate of 0.5 to 1.5 ft per year, which is a result of the overdraft of the basin.

3.4 Groundwater Quality

Groundwater quality in the upper aquifer in the Indio area has been impacted by historical land use but is generally suitable for use as a source of municipal water supply (see Table 3). The total dissolved solids (TDS) concentration in IWA Wells 1B and 1C, which are partially screened in the upper aquifer, is approximately 300 mg/L and is below the Maximum Contaminant Level (MCL) of 500 mg/L. Nitrate concentrations in these wells generally range from 0.7 to 1.0 mg/L (as nitrogen), which are well below the MCL of 10 mg/L. Nitrate concentrations in the VSD downgradient monitoring well, which is screened in the upper aquifer, range from non-detect to 4 mg/L (TH&Co, 2009).

By comparison, TDS concentrations in the lower aquifer generally range from 160 to 240 mg/L (see Table 3; Figure 5). Nitrate concentrations in this aquifer range from 0.55 to 5.3 mg/L (see Figure 6). Localized nitrate concentrations in the lower aquifer may be a result of vertical leakage from the upper aquifer, given that the hydraulic gradient is from the upper aquifer to the lower aquifer and that the aquitard that separates the two aquifers is not a complete barrier. The

quality of the groundwater from the lower aquifer is considered very good and is suitable for municipal supply use.

4 Conceptual Project Description

The VSD currently discharges approximately 7,000 acre-ft/yr of treated effluent to the Coachella Valley Stormwater Channel. As described in Tom Dodson & Associates (2010), the IWA Recycled Water Program would involve the diversion of up to 3.3 MGD from the VSD effluent for irrigation and/or groundwater recharge. As the amount of recycled water available for reuse is significantly less than the potential irrigation demand for the area (Carollo Engineers, 2010), it is anticipated that most of the diverted VSD water will be used for irrigation purposes. However, irrigation demand is seasonal and it is proposed to use recycled water available during periods of low demand for artificial recharge of the groundwater system. Conceptual Project features, including distribution pipelines and injection well locations, are shown on Figure 7.

Artificial recharge of the groundwater system can be accomplished through either surface spreading basins or injection wells. Surface spreading basins are typically utilized in areas with available land where the subsurface sediments provide an unobstructed hydraulic connection between the surface and the aquifer system. Injection wells are used in urban areas where the shallow subsurface sediments have low permeability and will not facilitate percolation of surface water to the aquifer system.

Injection wells have been preliminarily selected as the method for artificial recharge for the Project. In the Indio area, the target aquifer for artificial recharge is the lower aquifer where most of IWA's production wells are screened. Because this aquifer is separated from the upper aquifer by an aquitard (low permeability hydrogeologic unit), it will be necessary to use injection wells to directly benefit the lower aquifer system. Injection wells can be constructed in such a way as to also be used for groundwater production. These dual use wells are referred to as aquifer storage and recovery (ASR) wells. However, it is noted that groundwater production would not be possible from the ASR wells for a minimum period of six months after the last injection of recycled water, in order to meet regulatory requirements, which are described in detail in Section 6.

Conceptual injection well sites were selected based on the following criteria:

- Proximity to conceptual recycled water distribution pipelines;
- Upgradient of IWA wells and the localized groundwater pumping depression in the western portion of the Project Area; and
- Sufficient distance from existing production wells so as to satisfy regulatory requirement for recycled water residence time in the subsurface.

Four preliminary injection well sites were selected for evaluation of potential groundwater level impacts based on the above criteria (see Figure 7). Two injection wells are located adjacent to

the proposed recycled water pipeline along Avenue 42 north of the Coachella Valley Stormwater Channel and upgradient of most of IWA's production wells. The other two injection wells are located adjacent to the recycled water pipeline along 44th Avenue near the pumping depression in the western portion of the Project Area. All of the injection wells would be constructed to enable artificial recharge of the lower aquifer.

5 Analysis of Potential Groundwater Level Impacts Associated with the Project

In order to assess potential groundwater level changes associated with injection of recycled water at the proposed injection well sites shown on Figure 7, it was necessary to conduct an injection analysis using a 2-dimensional analytical groundwater flow model for the lower aquifer within the Project Area. The objectives of the model analysis were as follows:

1. Evaluate potential groundwater level changes from injecting recycled water at the four proposed injection well sites; and
2. Evaluate potential travel times for the recycled water.

5.1 Analysis Methodology – Potential Changes in Groundwater Levels

The model analysis was conducted using WinFlow, an analytical model code that simulates steady-state groundwater flow in two dimensions (Environmental Simulations, 2003). For analysis of potential changes in groundwater levels associated with injection, the model was constructed with the following assumed parameters:

1. The groundwater gradient is flat,
2. The aquifer thickness is 1,000 ft,
3. The aquifer hydraulic conductivity is 50 ft/day,
4. The aquifer porosity is 0.15, and
5. The aquifer storage coefficient is 0.0001 (confined conditions),

Using the above assumptions, WinFlow simulates changes in groundwater levels associated with injection through the principal of superposition. Based on this principal, the change in groundwater level at any point in the aquifer is the net sum of the individual injection mounds as if each well were injecting alone.

The aquifer thickness in the model was assumed to be that of the lower aquifer only, which is estimated to extend from 400 ft bgs to 1,400 ft bgs. Aquifer hydraulic conductivity was based on values used in the United States Geological Survey model of the Upper Coachella Valley (Reichard and Meadows, 1992) and is generally consistent with hydraulic conductivities estimated from pumping tests in CVWD and IWA wells. A storage coefficient of 0.0001 was selected to simulate confined aquifer conditions, which is consistent with previous studies of the lower aquifer in the Indio Area (Tyley, 1974).

Analysis of potential changes in groundwater levels associated with recycled water injection at the four well sites was conducted at an assumed total injection rate of 3.3 MGD, which is the total recycled water diversion amount from VSD. Although it is unlikely that the total amount of diverted recycled water will be used in any given year for injection, this volume was used in the simulations to assess a maximum potential impact. Recycled water for injection was apportioned equally between the four injection wells shown on Figure 7, which resulted in an injection rate of 573 gallons per minute (gpm) per well. Injection was also assumed to occur continuously at this rate for a period of one year.

5.2 Results of the Analysis of Potential Changes in Groundwater Levels

Model results of the analysis of potential groundwater level changes from injection show that maximum changes in groundwater levels are expected to be less than 4 ft of rise in the immediate vicinity of the injection wells (see Figure 8). Maximum groundwater level rise at other production wells in the area would range from less than 1 ft to approximately 3 ft. Given that the aquifer system in the Indio Subbasin is in overdraft, any positive change in groundwater levels would be considered beneficial. The analysis shows that the beneficial groundwater rise would be relatively widespread but would not significantly impact groundwater levels in existing wells.

6 Potential Groundwater Quality Impacts

6.1 Regulations Guiding Recycled Water Recharge

Federal and State policies that apply to the use of recycled water for artificial recharge of aquifers include Federal and State Anti-degradation policies and State of California Department of Public Health (DPH) regulations for recycled water reuse. Federal anti-degradation policy, as specified in 40 CFR 131.12, requires individual states to adopt anti-degradation policies to ensure that water quality is maintained and protected. As it is up to the individual states to develop the policy and methods of implementation, further discussion of anti-degradation policy is focused on the policies adopted by California, as described below.

6.1.1 California Anti-degradation Policy

The basic tenets of California's anti-degradation policy are outlined in State Water Resources Control Board (SWRCB) Resolution 68-16, which states:

1. *Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.*

2. *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.*

Implementation of California's anti-degradation policy is delegated to the individual Regional Water Quality Control Boards (RWQCBs) through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. SWRCB guidance for implementation of the anti-degradation policy is outlined in Administrative Procedure 90-04, which outlines different levels of analysis that RWQCBs can require in order to evaluate a proposed project's impact on existing water quality. For projects where the potential impacts on water quality are anticipated to be minor, a "simple" anti-degradation analysis may be required. For projects that have the

potential to significantly increase pollutant loadings to existing water, the RWQCBs can require a "complete" anti-degradation analysis.

For any proposed project that has the potential to alter the existing water quality, it must be demonstrated that the water quality change is consistent with the maximum benefit to the people of the State, and the change is balanced by significant benefits for economic and social development. Factors for consideration include:

1. Past, present and probable beneficial uses,
2. Economic costs to maintain water quality compared to the benefits,
3. Environmental aspects of the proposed discharge, and
4. Consideration of feasible alternative control measures which might reduce, eliminate or compensate for negative impacts to water quality.

6.1.2 Groundwater Quality Standards – Colorado River Basin Region

Established groundwater quality standards by the Regional Water Quality Control Board - Colorado River Basin are specified in the latest version of the Water Quality Control Plan (RWQCB, 2006). Beneficial uses of the groundwater for the Coachella Valley area include municipal, industrial and agricultural uses. Specific groundwater quality objectives include the following:

Taste and Odors – Groundwater for use as municipal or domestic supply shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses as a result of human activity.

Bacteriological Quality – The concentration of coliform organisms shall not exceed the limits specified in California Code of Regulations (CCR) Title 22, Chapter 15, Article 3.

Chemical and Physical Quality – Groundwater shall not contain concentrations of chemical constituents in excess of the limits specified in CCR Title 22, Chapter 15, Article 4, Section 64435, Tables 2, 3 and 4 as a result of human activity.

Brines – Discharges of water softener regeneration brines, other mineralized wastes, and toxic wastes to disposal facilities which ultimately discharge in areas where such wastes can percolate to groundwater useable for domestic and municipal purposes is prohibited.

Radioactivity – Groundwater shall not contain radioactive material in excess of the limits specified in CCR Title 22, Chapter 15, Article 5, Sections 64441 and 64443.

6.1.3 California State Regulations for Groundwater Recharge Using Recycled Water

Regulations for the use of recycled municipal wastewater for groundwater recharge are specified in CCR Title 22, Chapter 3 Recycling Criteria. The regulations are prepared by the DPH and are currently in draft form (the latest version is dated August 5, 2008). The regulations address artificial recharge by both surface spreading and injection wells. Recycled water to be used for artificial recharge must be treated by either filtration or to disinfected tertiary standards as defined in Title 22 Chapter 3. The Project proposes to use advanced treatment including Reverse Osmosis (RO) for the recycled water, which meets the strictest interpretation of filtration as defined in the Recycling Criteria regulations. Further discussion of recycled water recharge requirements are related to this level of treatment.

For general requirements, the draft regulations stipulate that recycled water for a groundwater recharge project must be from a wastewater management agency that administers an industrial pretreatment and source control program. The source control program must include:

1. An assessment of the nature and fate of DPH-identified contaminants;
2. Monitoring programs for DPH-identified contaminants of concern;
3. An outreach program to entities within the agency service area that contribute industrial, municipal and residential wastewater as an effort to control and manage contaminants in the wastewater; and
4. An up-to-date inventory of contaminants discharged into the wastewater collection system so that new contaminants can be readily evaluated.

Prior to implementation of the recycled water recharge program, the responsible agency will be required to conduct a public review and hearing process to specify the details of the project and allow for public comment. The responsible agency will also be required to develop an Operation Plan for the recharge project that describes the operations, management and monitoring that will be required to implement the project. Finally, the agency will be required to develop an engineering report that describes the design of the reclamation project and demonstrates how it will comply with the regulations.

The DPH addresses the control of potential contaminants in the source water for recycled water recharge and downgradient receptors via a number of different engineering and analytical methods. The general categories of contaminants addressed include pathogenic microorganisms,

nitrogen compounds, other regulated chemicals and physical characteristics, and potential other contaminants. Monitoring will be required of both the treated recycled water and the groundwater from monitoring wells that will need to be constructed in the vicinity of the recharge facilities.

Control of Pathogenic Microorganisms

Control of pathogenic microorganisms is addressed through a combination of treatment and residence time in the aquifer system. Treatment can either consist of disinfected tertiary or filtration. The minimum residence time for recycled water in the subsurface is six months. For the purpose of siting artificial recharge facilities (either injection wells or spreading basins), the locations of the facilities must be a distance from existing production wells satisfactory to ensure 12 months' residence time (as analyzed using a calibrated numerical groundwater flow model) or 24 months' residence time (as analyzed using an analytical approach).

Upon construction of injection wells or spreading grounds, the 6-month residence time is assessed through tracer tests and monitoring as outlined in the DPH-approved Operation Plan.

Control of Nitrogen Compounds

Control of nitrogen concentrations in the groundwater near a recycled water recharge facility is accomplished through monitoring and analysis of total nitrogen in the recycled water prior to injection or spreading. Samples must be collected twice a week and analyzed for total nitrogen. Average weekly concentrations exceeding 5 mg/L must be addressed through reduction of nitrogen in the source water. Recycled water recharge would have to be suspended if average total nitrogen concentrations in the recycled water exceed 5 mg/L for four consecutive weeks.

Control of Other Regulated Chemicals and Physical Characteristics

For recycled water treated by RO, samples must be collected weekly for analysis of total organic carbon (TOC). The maximum allowable TOC in the recycled water would be determined based on the recycled water contribution, described below.

Recycled water must be analyzed quarterly for selected inorganic chemicals, radionuclides, organic chemicals, disinfection byproducts, lead and copper. In addition, a sample must be collected annually and analyzed for secondary drinking water constituents. Concentrations exceeding established Maximum Contaminant Levels (MCLs) require confirmation through resampling and analysis. Recycled water recharge must be suspended if the running 4-week average concentration of any constituent exceeds its respective MCL.

Required Monitoring for Other Contaminants

Based on recommendations from the State Water Resources Control Board's Science Advisory Panel, recycled water recharge projects may be required to collect and analyze recycled water samples from a number of chemicals of emerging concern (CECs). The recommendations include monitoring for health-based indicators such as caffeine, NDMA, 17b-estradiol, and others. It is unclear if and when these recommendations will be added to the monitoring requirements for artificial recharge projects.

Diluent Requirements/Recycled Water Contribution

Recycled water must be blended with another source of potable water prior to introduction into the subsurface via injection wells or spreading facilities. The blend water is referred to as "diluent" water and can come from a number of sources (e.g. imported water) as long as it meets certain water quality criteria. Underflow through the area is also considered a diluent water source. The percentage of recycled water in the blend is referred to as the recycled water contribution (RWC). The maximum initial RWC for recharge projects utilizing surface spreading basins and injection wells is 0.5 (50 percent) if the recycled water is treated with RO. This RWC is calculated as a 60 month rolling average. The RWC can be increased over time as long as certain monitoring requirements and analytical results are met.

Required Reporting

The DPH and RWQCB will require submittal of analytical results of recycled water monitoring on a monthly basis. Water quality results exceeding MCLs or total coliform requirements must be reported within 48 hours of receiving the results. Annual reports of recycled water recharge operations must be submitted to the DPH and RWQCB. In addition, the engineering report for the project must be updated every five years.

6.2 Potential Impacts of Recycled Water Recharge on Groundwater Quality

Recycled water diverted from the VSD treatment plant for artificial recharge would be further treated through a combination of advanced treatment processes prior to injection at the ASR wells. This advanced treatment process includes microfiltration, ultrafiltration, RO, and finally disinfection by ultraviolet advanced oxidation. The resulting TDS of the recycled water would be less than 100 mg/L and other constituents, including general minerals and ions, metals, bacteria, and organic compounds (including TOC) would be reduced to very low concentrations and, in most cases, below detection levels. The resulting water quality would be superior to the

native groundwater, thereby satisfying both SWRCB anti-degradation policy and RWQCB basin plan objectives.

6.3 Analysis of Potential Recycled Water Travel Times

Recycled water travel times in the aquifer were evaluated using a modified version of the WinFlow model described in Section 5.1. All aquifer parameter values used in the analysis of potential groundwater level changes (i.e. aquifer thickness, hydraulic conductivity, storage coefficient, etc.) were used in the analysis of recycled water travel times. The primary difference for this analysis was the incorporation of groundwater levels resulting in a representative gradient and flow direction. Simulated groundwater levels were calibrated to groundwater levels measured in November 2010, as shown on Figure 4. The calibration resulted in a relative error[1] of approximately 7 percent, which is considered acceptable for the analysis (see Table 4).

Recycled water travel times were analyzed using the particle tracking feature in the calibrated WinFlow model. Particle tracking provides an analytical expression of a water "particle's" flow path and travel time from the points of origin, which in this case are the injection wells. Particle tracking accounts for advective groundwater flow only and does not take into account dispersion or other aquifer transport mechanisms. However, it provides a conservative estimate of the migration rate and direction of flow of the injected water.

Two-year particle traces for each conceptual injection well are shown on Figure 8. As shown, injected recycled water would not reach any downgradient production wells within two years of injection. This satisfies the DPH's requirement of a 24-month recycled water residence time for the control of pathogenic organisms, as described in Section 6.1.3.

[1] Relative error is the standard deviation of the residuals (difference between measured and model-generated groundwater levels) divided by the range in measured hydraulic head across the model area.

7 Summary of Findings

The principal findings of the evaluation of potential groundwater impacts are as follows:

- The IWA is proposing to divert recycled water generated at the VSD WWTP for beneficial uses that include irrigation and artificial recharge of the groundwater system;
- The groundwater system has been categorized into perched, upper and lower aquifers, each separated by low permeability silt and clay layers;
- The upper and lower aquifer systems are both in a state of overdraft, whereby groundwater pumping is currently exceeding recharge resulting in dropping groundwater levels;
- Artificial recharge of the groundwater system would be focused on the lower aquifer system in order to benefit IWA's wells, which are perforated within this aquifer;
- In order to recharge the lower aquifer system, it will be necessary to use injection wells that are perforated in the lower aquifer;
- Four potential injection well locations were identified in areas that are upgradient of most of IWA's wells and in areas where there are existing pumping depressions (see Figure 7). Other criteria for selection of injection well sites included proximity to proposed recycled water pipeline and adequate distance from existing wells so as to satisfy DPH recycled water travel times in the aquifer;
- Although recycled water recharge would likely be limited to certain periods of the year when irrigation demand was low, evaluation of potential groundwater level impacts was conducted using the maximum amount of available recycled water (3.3 MGD) and assumed recharge for a full year to assess the maximum potential impact;
- The results of the analysis of groundwater level impacts shows a maximum positive change (i.e. rise) of approximately 3.5 ft in the immediate vicinity of the injection wells;
- Potential changes in groundwater levels at other area wells would range from less than 1 ft to approximately 3 ft;
- Positive changes in groundwater levels are considered a benefit in that they help mitigate the effects of regional overdraft in the aquifer system;
- Evaluation of potential groundwater quality impacts from the artificial recharge of recycled water are based on advanced treatment of the recycled water, which results in a recycled water quality that is superior to that of the native groundwater;
- Using advanced treated recycled water, the artificial recharge program does not violate Federal and State anti-degradation policy and meets the requirements of the RWQCB's Water Quality Control Plan;

- Implementation of the recycled water recharge project would include certain requirements from the California DPH, including a public hearing process, development of both operation plans and engineering reports, blending water requirements (initially the injection water must be a 50:50 blend of recycled water and water from another approved source), and monitoring and reporting; and
- Analysis of potential recycled water travel times at the proposed injection well locations shows that the injected water would not reach any existing production wells within two years of introduction into the aquifer, thus satisfying DPH requirements for siting injection wells.

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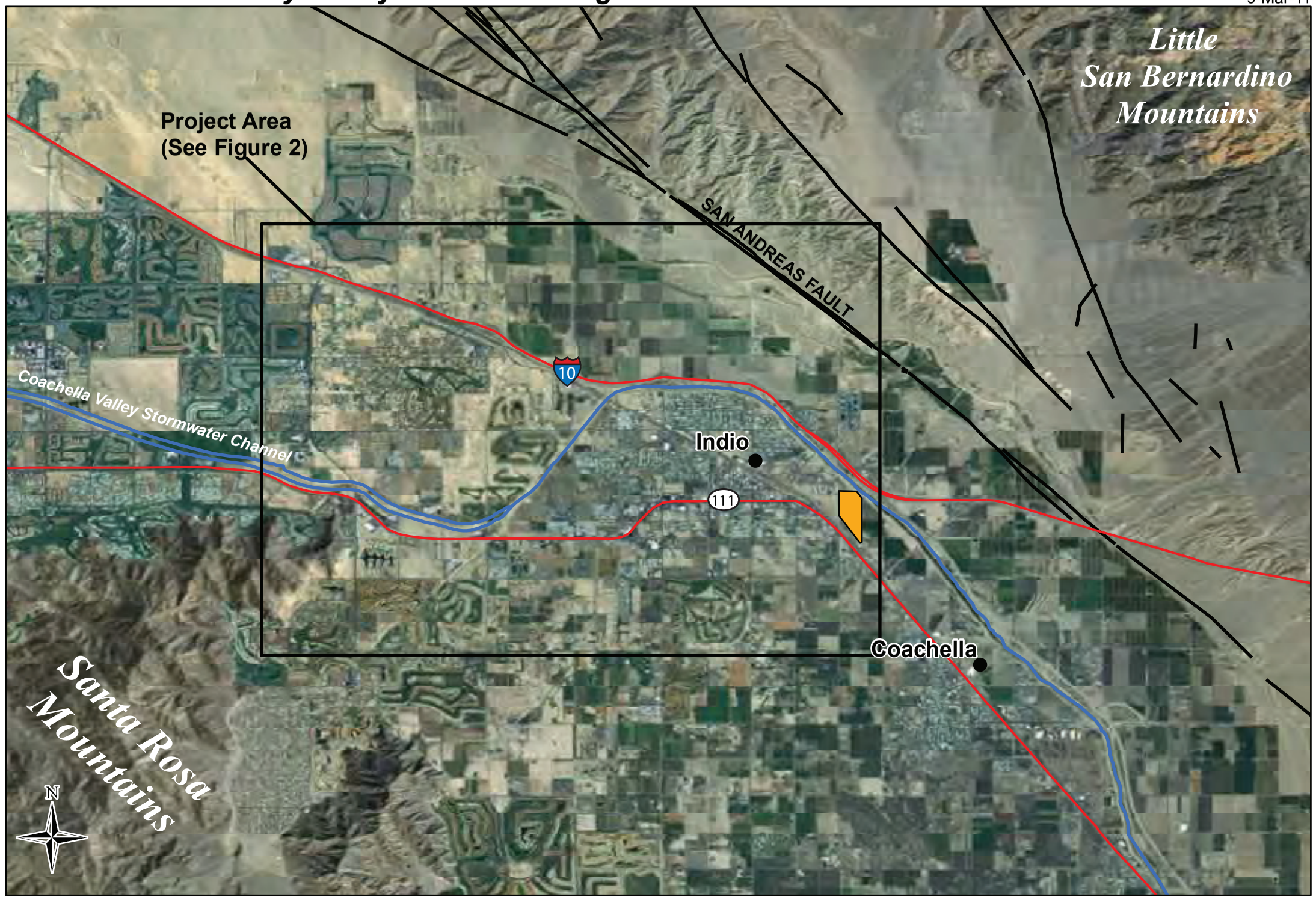
9-Mar-11

Evaluation of Potential Groundwater Impacts



0 1 2 4 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- Valley Sanitary District Wastewater Treatment Plant
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Regional Setting

DRAFT

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Groundwater Consulting

Regional Map
Figure 1

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9-Mar-11

Evaluation of Potential Groundwater Impacts

0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- IWA Production Wells
- CVWD Monitoring Wells
- CVWD Production Wells
- Other Wells
- VSD WWTP
- Cross Section A-A'
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

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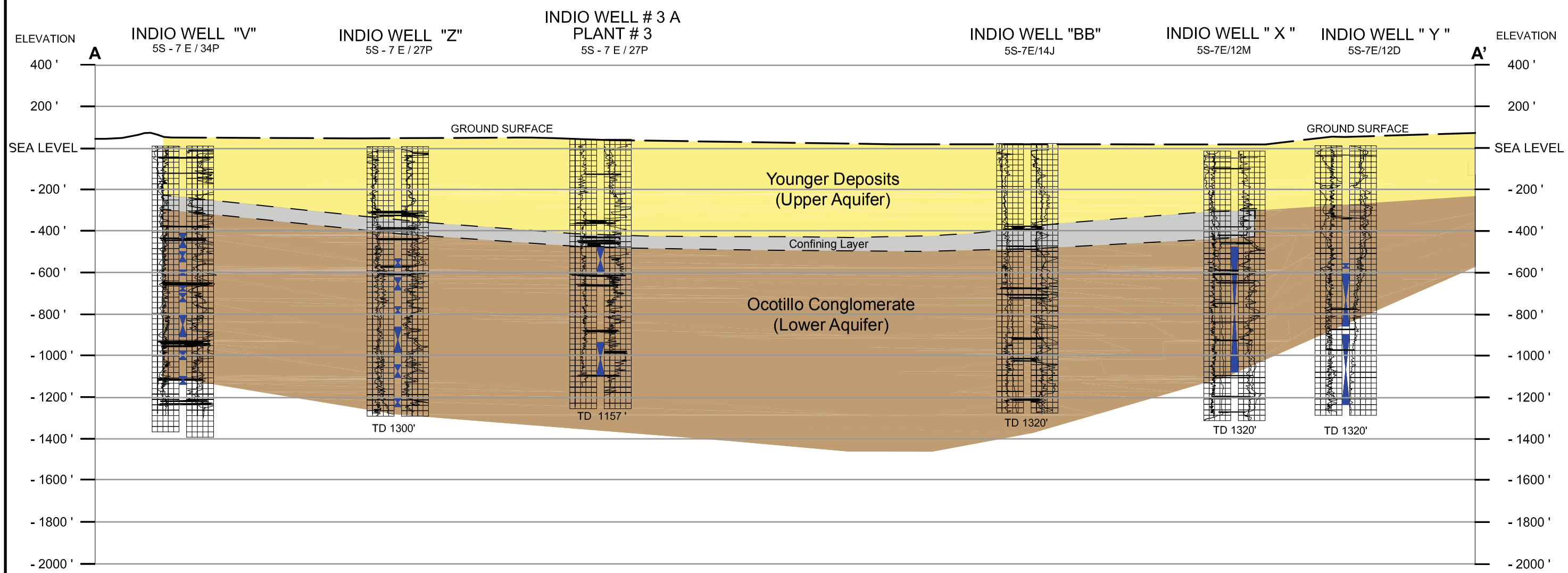
Project Area with Existing Wells
Figure 2

9-Mar-11



TD = Total Depth

Sources of Data: - Modified from R.C. Slade Associates, 2007
- DWR, 1964

DRAFT

Hydrogeologic Cross Section A - A'

Figure 3

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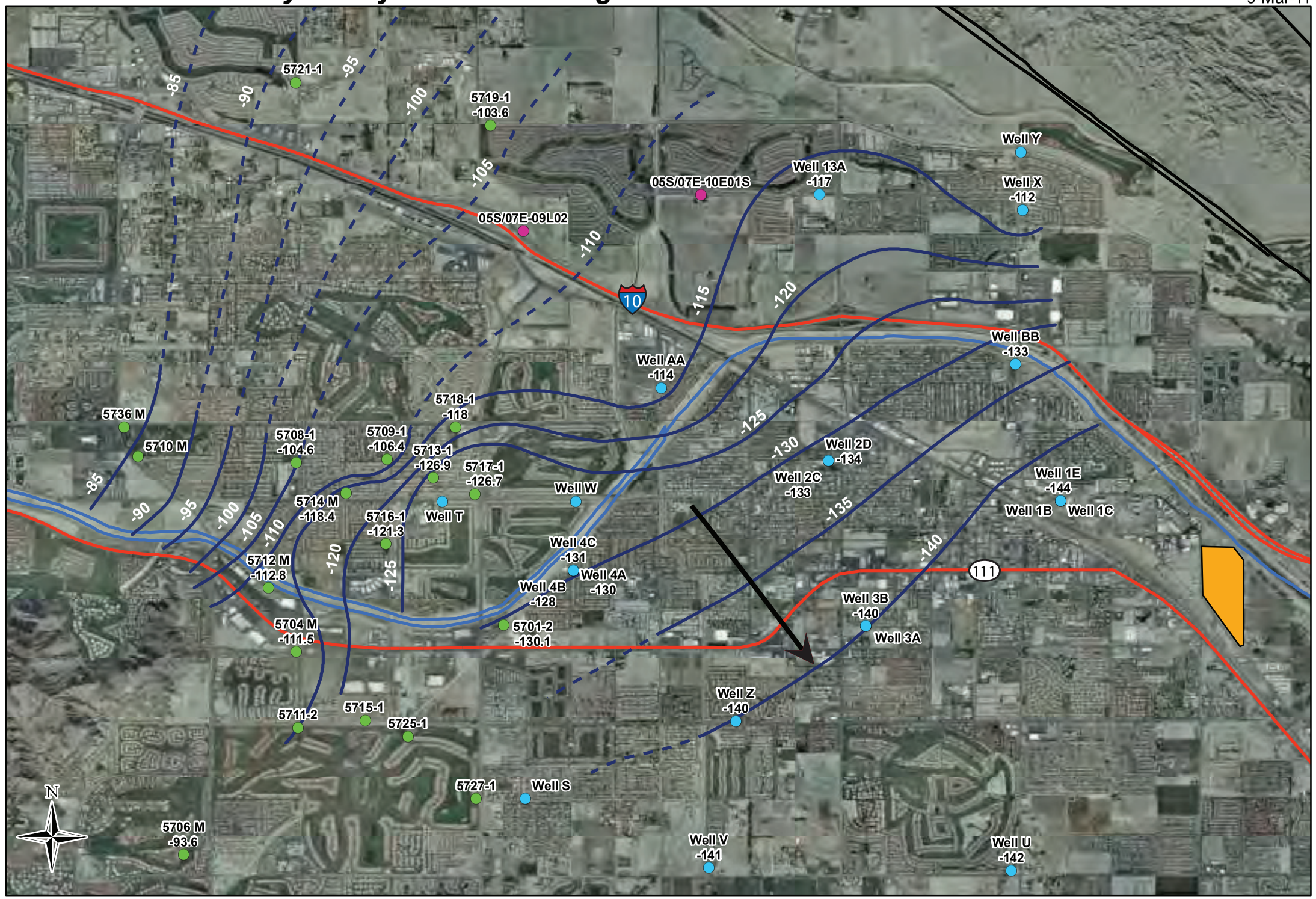
9-Mar-11

Evaluation of Potential Groundwater Impacts



0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- IWA Wells
- CVWD Wells
- Other Wells
- VSD WWTP
- 5 ft Groundwater Elevation Contour (amsl) (dashed where approximate)
- Groundwater Flow Direction
- Coachella Valley Stormwater Channel
- Highways
- Faults

Note: Groundwater Levels measured in October and November 2010

Basemap Source: www.esri.com

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Groundwater Level Contour Map- Lower Aquifer

Figure 4

Thomas Harder & Co.
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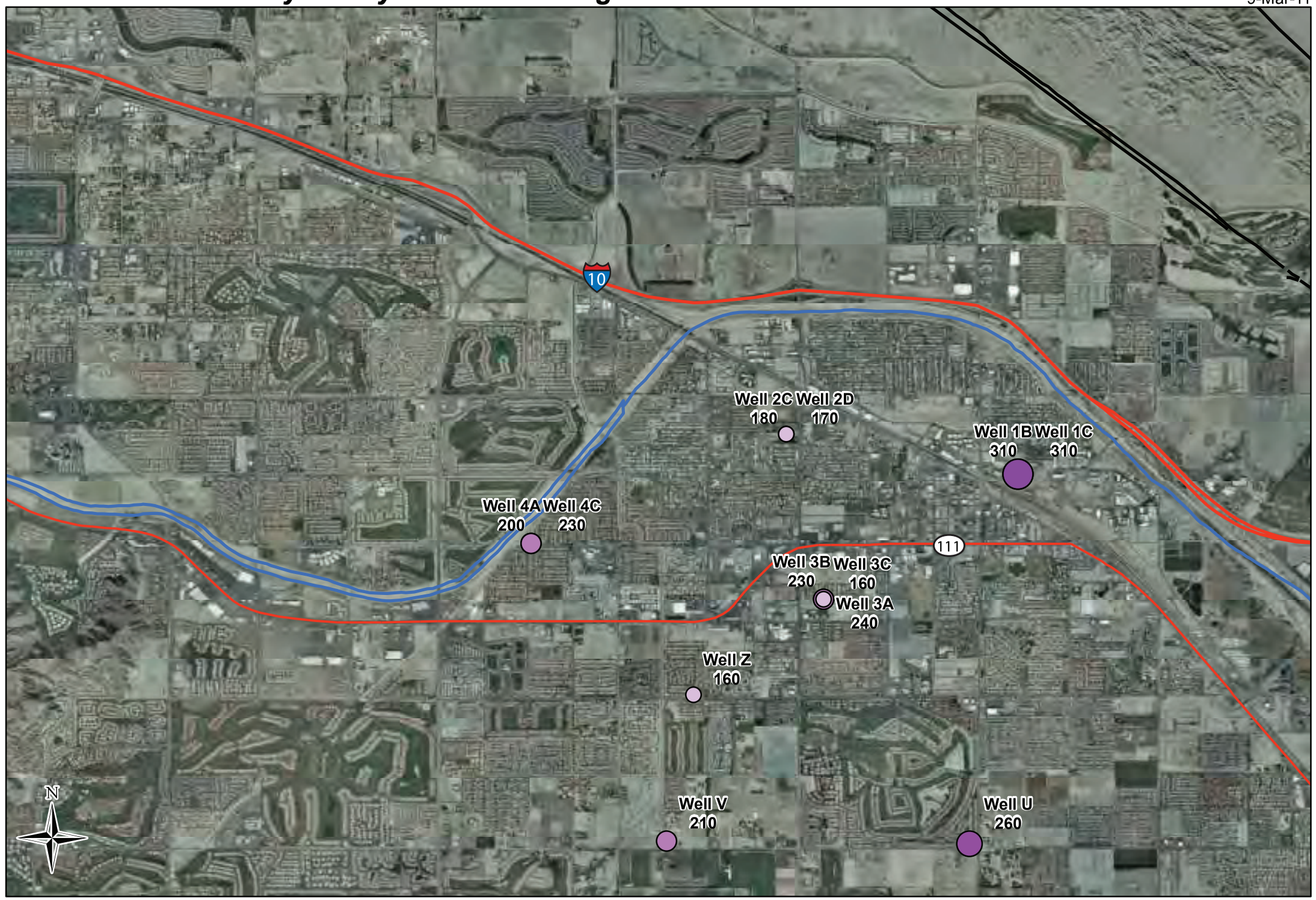
Tom Dodson & Associates
Indio Water Authority - Recycled Water Program

9-Mar-11

Evaluation of Potential Groundwater Impacts



NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

Total Dissolved Solids (TDS) (mg/L)

- < 200
- 200-249
- 250-299
- > 300
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Data collected 9-Sep-10 for Wells 1B, 1C,3A,3B,3C,V, and Z

Data collected 1-Oct-10 for Wells 2C, 2D,4A, and U

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Total Dissolved Solids (TDS) Concentrations in Groundwater

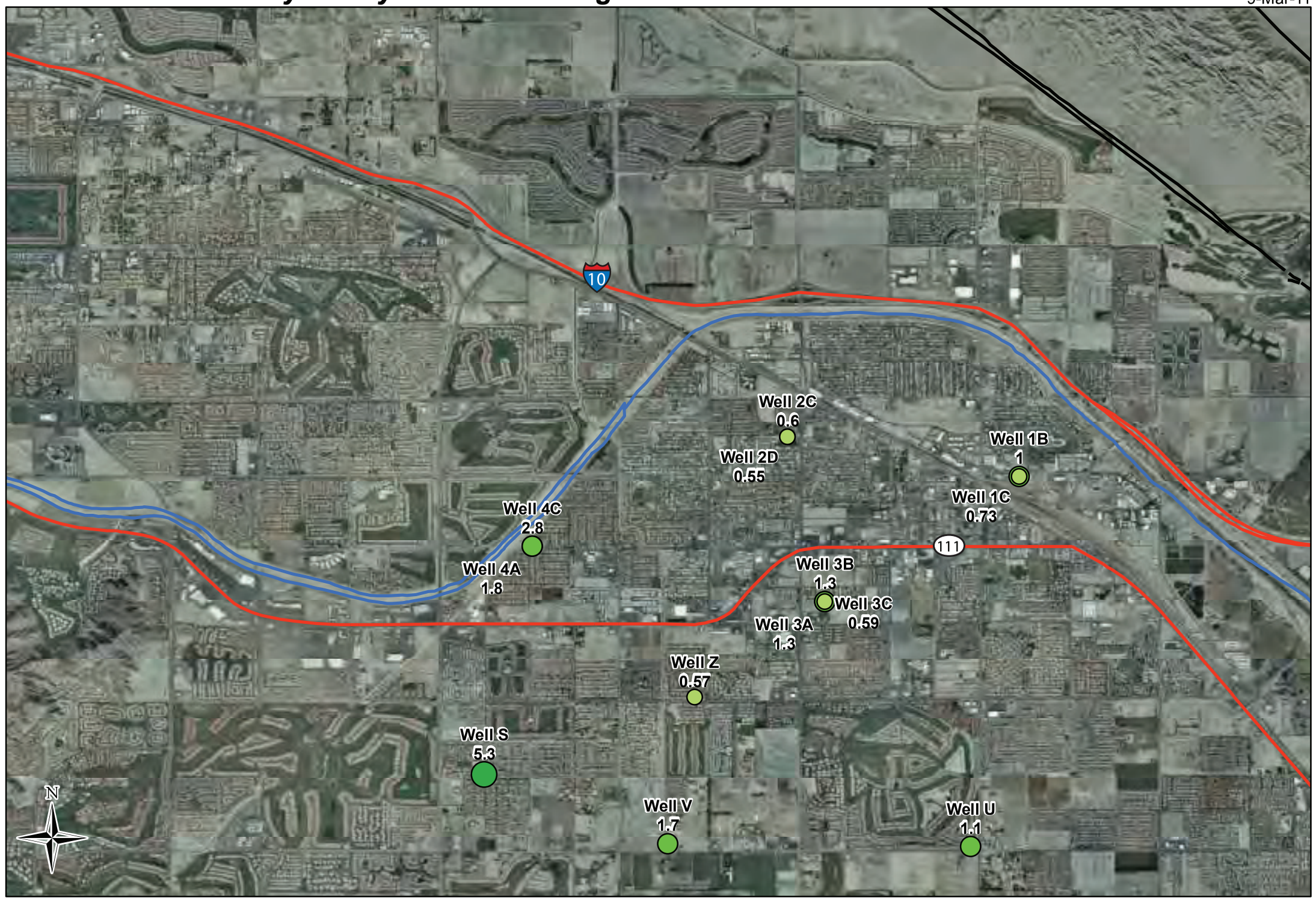
Figure 5

Thomas Harder & Co.
Groundwater Consulting

Tom Dodson & Associates
Indio Water Authority - Recycled Water Program

9-Mar-11

Evaluation of Potential Groundwater Impacts



NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

Nitrate as N (mg/L)

- < 1
- 1.0-2.9
- > 3.0
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Data Collected 28-Jul-10 for Well S

Data collected 9-Sep-10 for Wells 1B, 1C,3A,3B,3C,V, and Z

Data collected 1-Oct-10 for Wells 2C, 2D,4A, and U

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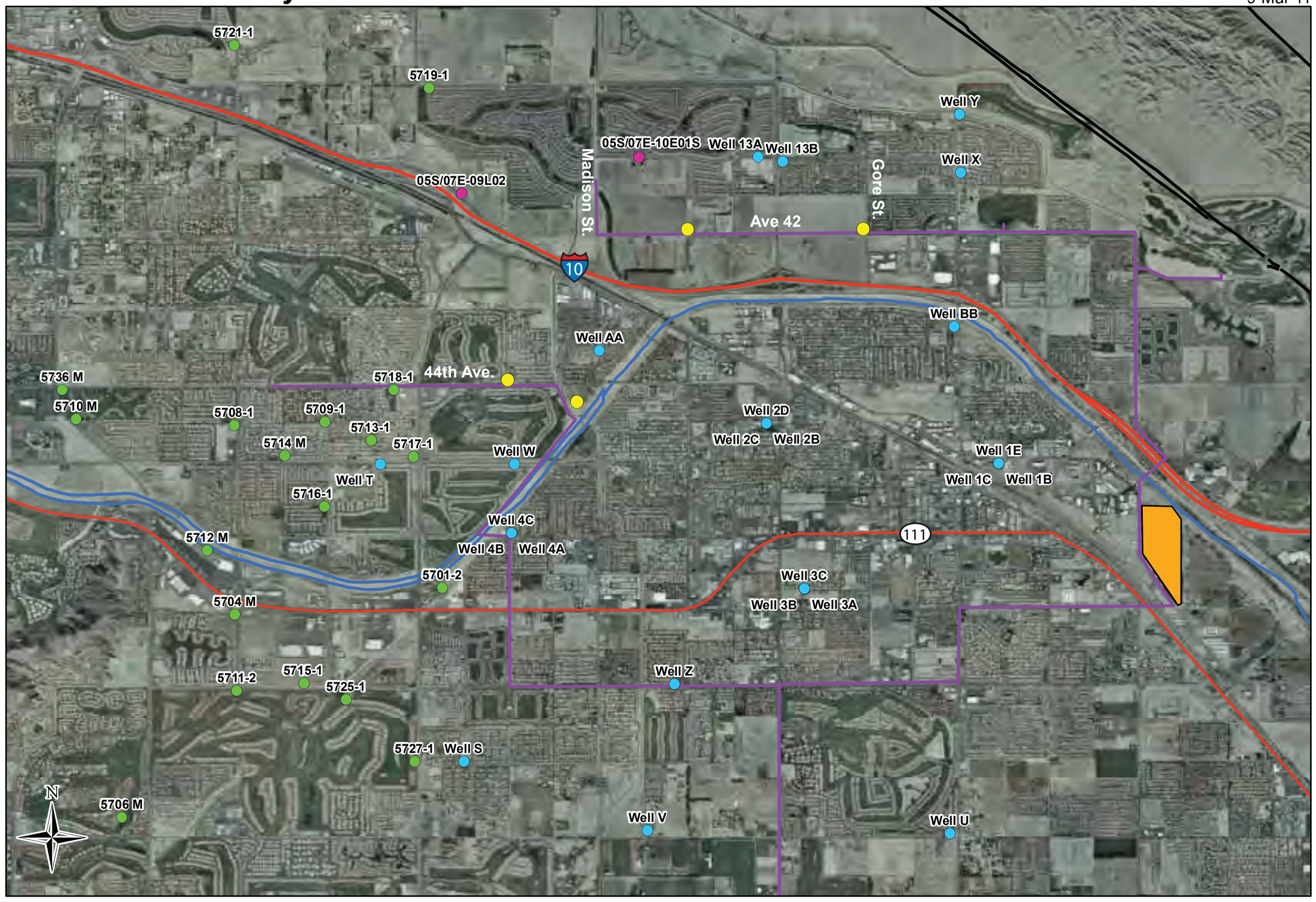
Nitrate Concentrations in Groundwater

Figure 6

Tom Dodson & Associates
Indio Water Authority

9-Mar-11

Indio Recycled Water Recharge Project



0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- Proposed Injection Wells
- IWA Wells
- CVWD Wells
- Other Wells
- VSD WWTP
- Proposed Recycled Water Transmission Main
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Transmission Main location from Carollo TM No. 1 Final, January 2010

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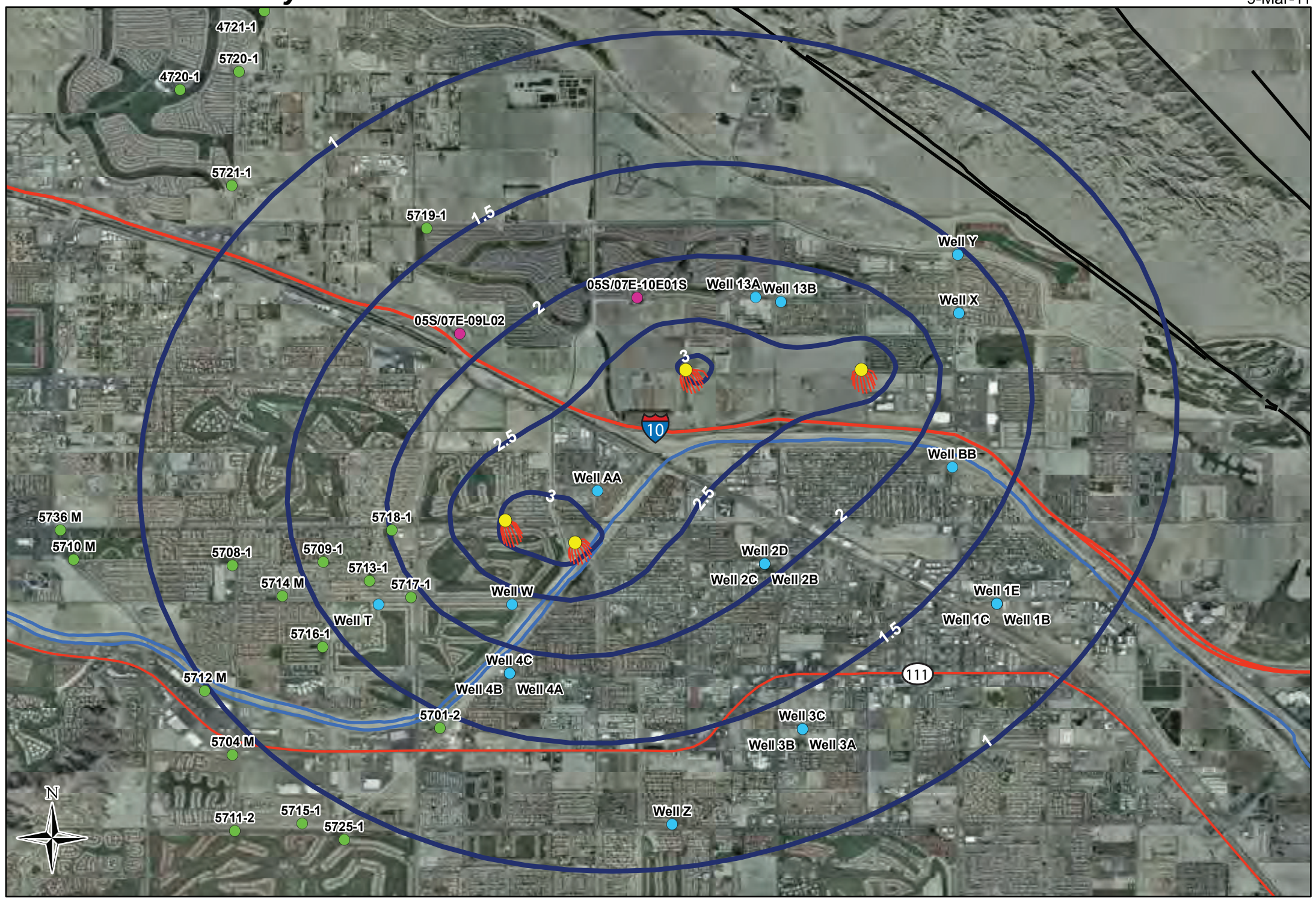
Proposed Recycled Water Program Features

Figure 7

Tom Dodson & Associates
Indio Water Authority

9-Mar-11

Indio Recycled Water Recharge Project



0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- Proposed Injection Wells
- IWA Wells
- CVWD Wells
- Other Wells
- Lines of Equal Change in Groundwater Level (ft)
- Two Year Particle Trace*
- Coachella Valley Stormwater Channel
- Highways
- Faults

* The two-year prarticle trace is the predicted distance injected recycled water would travel in two years following introduction to the aquifer.

Basemap Source: www.esri.com

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Thomas Harder & Co.
Groundwater Consulting

Simulated Change in Groundwater Levels

Figure 8

Summary of Well Construction Details
Indio Water Authority Wells

Well Name	Total Depth (ft)	Screen Interval (s) (ft bgs)[1]	Aquifer(s)
1A	500	205-422, 430-500	Upper/Lower
1B	410	190-410	Upper/Lower
1E	660	250-350,510-660	Upper/Lower
2A	882	485-699, 702-882	Lower
2B	1100	506-1100	Lower
2C	1152	480-1152	Lower
2D	1205	500-575,595-670,715-797, 880-930, 1050-1095, 1120-1200	Lower
3A	1157	515-630,970-1130	Lower
3B	1200	500-580,700-780,980-1200	Lower
3C	1100	515-630, 970-1110	Lower
4B	1170	460-720,810-1040,1100-1150	Lower
V	N/A	400-470,490-530,570-800,650-670,680-720,780-880,950-990	Lower
X	N/A	610-630,660-910,950-1280	Lower
Y	N/A	500-1000	Lower
Z	N/A	570-610,660-720,790-830,880-1130,1090-1150,1240-1280	Lower

Note:

[1] ft bgs = Feet below ground surface.

Summary of Groundwater Levels In The Project Area

Well Name	Date Measured	Ground Surface Elevation (ft amsl)[1]	Depth to Groundwater (ft bgs)[2]	Groundwater Elevation (ft amsl)[1]	Aquifer
IWA Well 1E	11-16-10	-20	124.0	-144	Upper/Lower
IWA Well 1B	11-16-10	-19	64.0	-83	Upper/Lower
IWA Well 1C	11-16-10	-20	64.0	-84	Unknown
IWA Well 2C	11-16-10	1	134.0	-133	Lower
IWA Well 2D	11-16-10	1	135.0	-134	Lower
IWA Well 3A	11-22-10	1	138.0	-137	Lower
IWA Well 3B	11-22-10	1	141.0	-140	Lower
IWA Well 4A	11-17-10	36	166.0	-130	Unknown
IWA Well 4B	11-17-10	36	164.0	-128	Lower
IWA Well 4C	11-17-10	36	167.0	-131	Unknown
IWA Well AA	11-16-10	13	127.0	-114	Unknown
IWA Well BB	11-16-10	-12	121.0	-133	Unknown
IWA Well T	11-16-10	72	208.0	-136	Unknown
IWA Well U	11-17-10	-7	135.0	-142	Unknown
IWA Well V	11-22-10	12	153.0	-141	Lower
IWA Well W	11-16-10	38	119.0	-81	Unknown
IWA Well X	11-17-10	8	120.0	-112	Lower
IWA Well Y	11-17-10	39	111.0	-72	Lower
IWA Well Z	11-22-10	13	153.0	-140	Lower
IWA Well 13A	11-16-10	21	138.0	-117	Unknown
CVWD 5704 M	11-17-2010	69.5	181.0	-111.5	Unknown
CVWD 5706 M	10-27-2010	46.9	140.5	-93.6	Unknown
CVWD 5710 M	10-29-2010	136.4	220.3	-83.9	Unknown
CVWD 5712 M	11-10-2010	76.3	189.1	-112.8	Unknown
CVWD 5714 M	11-18-2010	81.4	199.8	-118.4	Unknown
CVWD 5736 M	10-29-2010	141.2	229.1	-87.9	Unknown
CVWD 4720-1	10-25-2010	86.0	172.3	-86.3	Unknown
CVWD 4721-1	10-5-2009	89.6	155.8	-66.2	Unknown
CVWD 4722-1	10-26-2010	96.9	176.1	-79.2	Unknown
CVWD 5701-2	11-17-2010	46.4	176.5	-130.1	Unknown
CVWD 5708-1	11-10-2010	89.6	194.2	-104.6	Unknown
CVWD 5709-1	11-18-2010	76.9	183.3	-106.4	Unknown
CVWD 5711-2	11-10-2011	59.6	199.5	-139.9	Unknown
CVWD 5713-1	11-18-2010	74.1	201.0	-126.9	Unknown

Summary of Groundwater Levels In The Project Area

Well Name	Date Measured	Ground Surface Elevation (ft amsl)[1]	Depth to Groundwater (ft bgs)[2]	Groundwater Elevation (ft amsl)[1]	Aquifer
CVWD 5715-1	3-17-2010	55.9	177.4	-121.5	Unknown
CVWD 5716-1	11-10-2010	61.6	182.9	-121.3	Unknown
CVWD 5717-1	11-10-2010	48.9	175.6	-126.7	Unknown
CVWD 5718-1	11-10-2010	52.6	170.6	-118	Unknown
CVWD 5719-1	10-26-2010	51.5	155.1	-103.6	Unknown
CVWD 5720-1	10-26-2010	111.4	183.3	-71.9	Unknown
CVWD 5721-1	2-9-2010	88.4	158.0	-69.6	Unknown
CVWD 5725-1	5-28-2010	53.8	191.0	-137.2	Unknown
CVWD 5727-1	5-28-2010	43.8	184.5	-140.7	Unknown

Note:

[1] ft amsl = Feet above mean sea level.

[2] ft bgs = Feet below ground surface.

Summary of Selected Water Quality Constituents
Indio Water Authority Wells

Well Name	Total Dissolved Solids (mg/L)[1]	Nitrate as Nitrogen (mg/L)[1]
Well 1B	310*	1.0*
Well 1C	310	0.73
Well 2C	180	0.60
Well 2D	170	0.55
Well 3A	240	1.3
Well 3B	230	1.3
Well 3C	160	0.59
Well 4A	200	1.8
Well 4C	230	2.8
Well S	N/A	5.3
Well U	260	1.1
Well V	210	1.7
Well Z	160	0.57

Note:

[1] mg/L = Feet above mean sea level.

* Sample dates in September 2010 for all wells except Well S; Well S sampled in July 2010

Comparison of Observed and Model-Predicted Groundwater Levels

Well Name	Observed Groundwater Elevation (ft amsl)	Predicted Groundwater Elevation (ft amsl)	Residual (ft)
5710 M	-83.9	-88.6	4.7
4722-1	-79.2	-73.1	-6.1
4720-1	-86.3	-76.8	-9.5
5719-1	-103.6	-99.4	-4.2
13A	-117.0	-118.9	1.9
5736 M	-87.9	-86.0	-1.9
5708-1	-104.6	-110.9	6.3
5714 M	-118.4	-112.1	-6.3
5709-1	-106.4	-118.7	12.3
5718-1	-118.0	-123.5	5.5
5716-1	-121.3	-124.0	2.7
5713-1	-127.0	-127.5	0.5
5717-1	-126.7	-130.8	4.1
5712 M	-112.8	-106.0	-6.8
5704 M	-111.5	-109.9	-1.6
5701-2	-130.1	-132.5	2.4
4A	-130.0	-150.1	20.1
AA	-114.0	-130.3	16.3
2C	-133.0	-140.9	7.9
3B	-140.0	-143.3	3.3
Z	-140.0	-143.0	3.0
V	-141.0	-140.4	-0.6
BB	-133.0	-131.5	-1.5
X	-112.0	-110.9	-1.1
1E	-144.0	-155.3	11.3

Residual Mean	2.50
Residual Standard Deviation	7.04
Change in Head over Model Area	103 ft
Relative Error	6.83%

Note:

[1] ft amsl = Feet above mean sea level.

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Evaluation of Potential Groundwater Impacts

Indio Water Authority Recycled Water Program

March 9, 2011

Prepared for

Tom Dodson Associates/
Indio Water Authority

Prepared by

Thomas Harder
Principal Hydrogeologist

Thomas Harder & Co.
Groundwater Consulting

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1 Executive Summary

The Indio Water Authority (IWA) is proposing to use treated wastewater from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) near Indio, California for beneficial uses within their service area. Currently, VSD discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel, which is an unlined drainage that eventually discharges into the Salton Sea, located approximately 13 miles downstream. The proposed project, referred to as the IWA Recycled Water Program (the Project) as described in Tom Dodson & Associates (2010), would include diversion of a portion of the VSD discharges for irrigation use and possible artificial recharge of the groundwater system.

The purpose of this study is to document potential changes in hydrology and water quality that would be associated with artificial recharge of the groundwater system in the Indio area with recycled water from the VSD WWTP. Specifically, the study addresses:

1. Potential changes in groundwater levels that could be expected from artificial recharge;
2. Regulatory requirements for the recharge of recycled water; and
3. Potential changes in groundwater quality that could be expected from artificial recharge given the treatment methods proposed for the recycled water.

The Project Area is located within the southern portion of the Indio Subbasin of the regional Coachella Valley Groundwater Basin. Three principal aquifers have been identified in the Project Area: a shallow semiperched aquifer, an upper aquifer, and a lower aquifer. The upper and lower aquifers are separated by a confining layer of clay and silt (i.e. aquitard) that is approximately 100 ft thick in the Indio area. The IWA currently meets municipal and industrial water demand (approximately 23,000 acre-ft/yr) through groundwater pumping from 18 production wells. Most of the production occurs in the lower aquifer. For both the upper and lower aquifer, groundwater levels are declining at a similar rate of 0.5 to 1.5 ft per year, which is a result of the overdraft of the groundwater basin.

The existing groundwater quality of both the upper and lower aquifers meets regulatory requirements for use as municipal supply. Total dissolved solids (TDS) concentrations are typically less than 300 milligrams per liter (mg/L) and nitrate concentrations (as nitrogen) are typically less than 5 mg/L (the Maximum Contaminant Level is 10 mg/L).

The Project would include diversion of up to 3.3 million gallons per day (MGD) (3,698 acre-ft/yr) of recycled water from the VSD WWTP for use as irrigation water and/or artificial recharge of the groundwater system. Conceptual Project features include distribution pipelines

and up to four injection wells. Injection wells have been proposed to enable artificial recharge of the lower aquifer system, where most of IWA's wells are perforated.

Analysis of potential changes in groundwater levels associated with the artificial recharge of 3.3 MGD of recycled water at the four injection wells was conducted using WinFlow, an analytical model code that simulates steady-state groundwater flow in two dimensions. Analysis of potential water quality changes was conducted in the context of Federal, State and Regional water quality regulations. The findings from the analysis are as follows:

- The results of the analysis of groundwater level impacts shows a maximum positive change (i.e. rise) of approximately 3.5 ft in the immediate vicinity of the injection wells;
- Potential changes in groundwater levels at other area wells would range from less than 1 ft to approximately 3 ft;
- Positive changes in groundwater levels are considered a benefit in that they help mitigate the effects of regional overdraft in the aquifer system;
- Evaluation of potential groundwater quality impacts from the artificial recharge of recycled water are based on advanced treatment of the recycled water, which results in a recycled water quality that is superior to that of the native groundwater;
- Using advanced treated recycled water, the artificial recharge program does not violate Federal and State anti-degradation policy and meets the requirements of the Regional Water Quality Control Board's (RWQCB's) Water Quality Control Plan;
- Implementation of the recycled water recharge project would include certain requirements from the California Department of Health (DPH), including a public hearing process, development of both operation plans and engineering reports, blending water requirements (initially the injection water must be a 50:50 blend of recycled water and water from another approved source), and monitoring and reporting; and
- Analysis of potential recycled water travel times at the proposed injection well locations shows that the injected water would not reach any existing production wells within two years of introduction into the aquifer, thus satisfying DPH requirements for initial siting of injection wells.

2 Introduction

The Indio Water Authority (IWA) is proposing to use treated wastewater from the Valley Sanitary District (VSD) Wastewater Treatment Plant (WWTP) near Indio, California for beneficial uses within their service area. Currently, VSD discharges approximately 7,000 acre-ft/yr of treated wastewater to the Coachella Valley Stormwater Channel, which is an unlined drainage that eventually discharges into the Salton Sea, located approximately 13 miles downstream. The proposed project, referred to as the IWA Recycled Water Program (the Project) as described in Tom Dodson & Associates (2010), would include diversion of a portion of the VSD discharges for irrigation use and possible artificial recharge of the groundwater system.

The Project Description, as described in the Initial Study (Tom Dodson & Associates, 2010), indicates that the amount of recycled water currently available for beneficial uses is approximately 3.3 million gallons per day (MGD). As the amount of recycled water available for reuse is significantly less than the potential irrigation demand for the area (Carollo Engineers, 2010), it is anticipated that most of the diverted VSD water will be used for irrigation purposes. However, irrigation demand is seasonal and it is proposed to use recycled water available during periods of low demand for artificial recharge of the groundwater system.

2.1 Purpose and Scope of this Study

The purpose of this study is to document potential changes in hydrology and water quality that would be associated with artificial recharge of the groundwater system in the Indio area with recycled water from the VSD WWTP. Specifically, the study addresses:

4. Potential changes in groundwater levels that could be expected from artificial recharge;
5. Regulatory requirements for the recharge of recycled water; and
6. Potential changes in groundwater quality that could be expected from artificial recharge given the treatment methods proposed for the recycled water.

2.2 Project Area Location

The Project Area includes the general vicinity of Indio, California as shown on Figure 1. This includes the VSD WWTP and Posse Park on the east, Bermuda Dunes on the north, Palm Desert and Eisenhower Mountain on the west, and 50th Avenue on the south. The Project Area was

selected to encompass all proposed project features, as described later in this report, and enable the evaluation of potential changes in regional groundwater flow patterns and groundwater quality.

2.3 Sources of Data

Sources of data used in the analysis included the following:

- Data, files and reports provided by IWA, including well records, driller's logs, groundwater levels, groundwater quality and pumping data;
- Data provided by the Coachella Valley Water District, including groundwater levels, pumping test data, and well locations;
- WWTP water quality from VSD;
- Regulatory requirements for artificial recharge from the California Department of Public Health; and
- Groundwater quality criteria from the Regional Water Quality Control Board – Colorado River Basin.

A complete list of references is provided Section 8.

3 Physical Setting of the Project

The Project Area is located within the southern portion of the Coachella Valley of south central Riverside County, California (see Figures 1 and 2). The Coachella Valley is an elongated northwest/southeast trending lowland area that represents the landward extension of the Gulf of California. In the Project Area, the valley is bound on the northeast by the Little San Bernardino Mountains and the Mecca Hills and on the southwest by the Santa Rosa Mountains (see Figure 1). The climate of this area is typical of the desert with average annual precipitation of approximately 3 inches/yr (National Climate Data Center, 2009) and an evapotranspiration rate of greater than 70 inches/yr (CIMIS, 2009).

3.1 Hydrology

The primary surface water feature draining the Project Area is the Coachella Valley Stormwater Channel, which originates in the southern San Bernardino Mountains at the north end of the valley and drains through the Project Area to the Salton Sea. The channel is dry most of the time, flowing only during the rainy season and during periods of prolonged precipitation. South of Indio, surface flow in the channel is primarily from treated wastewater discharge and agricultural irrigation return flow. Average annual surface water flow at the United States Geological Survey (USGS) stream gage at Indio (located approximately 1.5 miles upstream of the VSD point of discharge to the channel; see Figure 2) is approximately 2,700 acre-ft/yr (USGS, 2009).

3.2 Geology

The Coachella Valley is a fault bounded lowland depression that represents the northern extension of the Salton Trough. The most prominent fault in the Project Area is the San Andreas Fault Zone, which trends in a northeast-southwest direction through the north-central portion of the valley. The mountains on the west side of the valley consist primarily of pre-Tertiary igneous and metamorphic rock. The Mecca Hills that bound the valley on the east side consist of consolidated Tertiary sedimentary rocks. Rapid subsidence of the valley floor during geologic time (last 12 million years; Sneed and Brandt, 2007) and subsequent sedimentation has resulted in the alluvial basin that exists today. The maximum depth of alluvial sediments has been estimated to be approximately 12,000 ft although only the upper approximately 2,000 ft of sediments are water-bearing (DWR, 1979).

The surface geology of the Project Area is characterized by an alluvial filled basin surrounded by mountains consisting of granitic, metamorphic and localized sedimentary rocks. The subsurface alluvial sediments are highly stratified with alternating layers of more permeable sand and gravel with fine-grained silt and clay (see Figure 3). The interbedded nature of the sediments is, in part, associated with historical periods when the Colorado River would flood the Salton Trough, depositing layers of silt and clay. Significant subsurface alluvial units, in order of youngest to oldest, are as follows:

Younger Deposits – Late Pleistocene to Holocene unconsolidated alluvial fan, lake, stream and sand dune deposits that consist of sand, gravel, silt and clay. Sediments range in depth from 0 to 300 ft and, where saturated, make up the upper aquifer system.

Ocotillo Conglomerate – Late Pleistocene alluvial fan and debris flows composed mainly of unconsolidated coarse sand and gravel with minor interbedded silt and clay (DWR, 1964). The sand and gravel layers of the Ocotillo Conglomerate form the lower aquifer system, which is the primary groundwater production aquifer for the Indio area. The one exception to the lithology in this unit is a silt and clay layer in the uppermost portion that forms an aquitard which separates the upper aquifer from the lower aquifer. The aquitard is as much as 100 ft thick in the Indio area.

Consolidated rocks that form the mountains and hills surrounding the Project Area have been described as follows:

Quaternary and Tertiary Sedimentary Deposits – Outcrops of Late-Tertiary and Quaternary sedimentary units make up the Indio and Mecca Hills at the eastern edge of the Project Area and presumably at depth below the Ocotillo Conglomerate. Named units include the Palm Springs, Borrego, and Canebrake formations.

Basement Complex – Pre-Tertiary consolidated rocks consisting primarily of Precambrian metamorphic rocks intruded by Cretaceous granitic rocks of the southern California Batholith (DWR, 1964).

The most significant fault in the Project Area is the San Andreas Fault Zone, which trends northwest-southeast along the northeast portion of the Project Area (see Figure 1). Individual branches within the fault zone include the Banning Fault and the Mission Creek Fault (Yule and Sieh, 2003). These are northwest-southeast trending right-lateral strike-slip faults that transfer slip between the North American and Pacific tectonic plates and act as groundwater flow barriers (DWR, 2003).

3.3 Hydrogeology

The Project Area is located within the southern portion of the Indio Subbasin of the regional Coachella Valley Groundwater Basin (DWR, 2003). The southern portion of the Indio Subbasin (i.e. from Indio to the Salton Sea) is referred to in this report as the Lower Coachella Valley. Three principal aquifers have been identified in the Project Area: a shallow semiperched aquifer, an upper aquifer, and a lower aquifer. The upper and lower aquifers are separated by a confining layer of clay and silt (i.e. aquitard) that is approximately 100 ft thick in the Indio area (see Figure 3). The top of this lower permeable zone occurs from approximately 300 to 400 ft bgs. The lower aquifer occurs within the Ocotillo Conglomerate.

3.3.1 Groundwater Recharge

The Indio Subbasin receives groundwater recharge from multiple sources, including natural recharge from precipitation, return flow recharge from irrigation, and subsurface inflow from the upper portion of the Coachella Valley. Average annual natural recharge to the Coachella Valley as a whole has been estimated as approximately 49,000 acre-ft/yr (CVWD, 2002). Of this natural recharge, only a small percentage directly recharges the Lower Coachella Valley due to its low elevation and limited precipitation. The primary source of groundwater recharge in the Lower Coachella Valley is from golf course and agricultural return flows, which contribute more than 100,000 acre-ft/yr to the groundwater system (CVWD, 2002). Subsurface inflow accounts for 30,000 acre-ft/yr to the groundwater system.

3.3.2 Groundwater Discharge

The primary source of groundwater discharge from the Lower Coachella Valley is groundwater pumping from wells. The locations of municipal wells in the Project Area are shown on Figure 2. The IWA currently meets municipal and industrial water demand through groundwater pumping from 18 production wells (see Table 1). With the exception of Wells 1B and 1C, all groundwater pumping is from the lower aquifer. Annual IWA water demand is approximately 23,000 acre-ft/yr (IWA, 2009).

In addition to IWA pumping, the CVWD pumps groundwater from wells within the Project Area (see Figure 2). Other sources of groundwater discharge in the area are through discharges to agricultural drains and evapotranspiration. Groundwater discharge in the Lower Coachella Valley exceeds the recharge, resulting in an overdraft condition with an average annual decrease in groundwater storage of approximately 42,000 acre-ft/yr (CVWD, 2002).

3.3.3 Groundwater Flow

In general, groundwater in the Project Area flows in a southeasterly direction (see Figure 4). In the south central portion of the Project Area, a localized groundwater pumping depression has developed where a number of municipal wells are located in close proximity (IWA Well T and CVWD Wells 5716-1, 5717-1, and 5713-1). Groundwater flow is more southerly to the east of these wells.

3.3.4 Historical Groundwater Levels

Groundwater levels in the Project Area vary in depth depending on the aquifer in which they are measured. Shallow groundwater levels measured in boreholes drilled in the vicinity of the VSD wastewater treatment plant occur between 40 and 60 ft below ground surface (bgs) and are attributed to the semi-perched aquifer (Leighton Consulting, Inc., 2006). Groundwater levels in the upper aquifer have historically been between approximately 90 and 100 ft bgs (Sneed and Brandt, 2007). Groundwater levels in IWA Wells 1B and 1C, which are partially perforated in the upper aquifer, are approximately 64 ft bgs (see Table 2). Groundwater levels in the lower aquifer are approximately 60 to 100 ft deeper than the upper aquifer. For both the upper and lower aquifer, groundwater levels are declining at a similar rate of 0.5 to 1.5 ft per year, which is a result of the overdraft of the basin.

3.4 Groundwater Quality

Groundwater quality in the upper aquifer in the Indio area has been impacted by historical land use but is generally suitable for use as a source of municipal water supply (see Table 3). The total dissolved solids (TDS) concentration in IWA Wells 1B and 1C, which are partially screened in the upper aquifer, is approximately 300 mg/L and is below the Maximum Contaminant Level (MCL) of 500 mg/L. Nitrate concentrations in these wells generally range from 0.7 to 1.0 mg/L (as nitrogen), which are well below the MCL of 10 mg/L. Nitrate concentrations in the VSD downgradient monitoring well, which is screened in the upper aquifer, range from non-detect to 4 mg/L (TH&Co, 2009).

By comparison, TDS concentrations in the lower aquifer generally range from 160 to 240 mg/L (see Table 3; Figure 5). Nitrate concentrations in this aquifer range from 0.55 to 5.3 mg/L (see Figure 6). Localized nitrate concentrations in the lower aquifer may be a result of vertical leakage from the upper aquifer, given that the hydraulic gradient is from the upper aquifer to the lower aquifer and that the aquitard that separates the two aquifers is not a complete barrier. The

quality of the groundwater from the lower aquifer is considered very good and is suitable for municipal supply use.

4 Conceptual Project Description

The VSD currently discharges approximately 7,000 acre-ft/yr of treated effluent to the Coachella Valley Stormwater Channel. As described in Tom Dodson & Associates (2010), the IWA Recycled Water Program would involve the diversion of up to 3.3 MGD from the VSD effluent for irrigation and/or groundwater recharge. As the amount of recycled water available for reuse is significantly less than the potential irrigation demand for the area (Carollo Engineers, 2010), it is anticipated that most of the diverted VSD water will be used for irrigation purposes. However, irrigation demand is seasonal and it is proposed to use recycled water available during periods of low demand for artificial recharge of the groundwater system. Conceptual Project features, including distribution pipelines and injection well locations, are shown on Figure 7.

Artificial recharge of the groundwater system can be accomplished through either surface spreading basins or injection wells. Surface spreading basins are typically utilized in areas with available land where the subsurface sediments provide an unobstructed hydraulic connection between the surface and the aquifer system. Injection wells are used in urban areas where the shallow subsurface sediments have low permeability and will not facilitate percolation of surface water to the aquifer system.

Injection wells have been preliminarily selected as the method for artificial recharge for the Project. In the Indio area, the target aquifer for artificial recharge is the lower aquifer where most of IWA's production wells are screened. Because this aquifer is separated from the upper aquifer by an aquitard (low permeability hydrogeologic unit), it will be necessary to use injection wells to directly benefit the lower aquifer system. Injection wells can be constructed in such a way as to also be used for groundwater production. These dual use wells are referred to as aquifer storage and recovery (ASR) wells. However, it is noted that groundwater production would not be possible from the ASR wells for a minimum period of six months after the last injection of recycled water, in order to meet regulatory requirements, which are described in detail in Section 6.

Conceptual injection well sites were selected based on the following criteria:

- Proximity to conceptual recycled water distribution pipelines;
- Upgradient of IWA wells and the localized groundwater pumping depression in the western portion of the Project Area; and
- Sufficient distance from existing production wells so as to satisfy regulatory requirement for recycled water residence time in the subsurface.

Four preliminary injection well sites were selected for evaluation of potential groundwater level impacts based on the above criteria (see Figure 7). Two injection wells are located adjacent to

the proposed recycled water pipeline along Avenue 42 north of the Coachella Valley Stormwater Channel and upgradient of most of IWA's production wells. The other two injection wells are located adjacent to the recycled water pipeline along 44th Avenue near the pumping depression in the western portion of the Project Area. All of the injection wells would be constructed to enable artificial recharge of the lower aquifer.

5 Analysis of Potential Groundwater Level Impacts Associated with the Project

In order to assess potential groundwater level changes associated with injection of recycled water at the proposed injection well sites shown on Figure 7, it was necessary to conduct an injection analysis using a 2-dimensional analytical groundwater flow model for the lower aquifer within the Project Area. The objectives of the model analysis were as follows:

1. Evaluate potential groundwater level changes from injecting recycled water at the four proposed injection well sites; and
2. Evaluate potential travel times for the recycled water.

5.1 Analysis Methodology – Potential Changes in Groundwater Levels

The model analysis was conducted using WinFlow, an analytical model code that simulates steady-state groundwater flow in two dimensions (Environmental Simulations, 2003). For analysis of potential changes in groundwater levels associated with injection, the model was constructed with the following assumed parameters:

1. The groundwater gradient is flat,
2. The aquifer thickness is 1,000 ft,
3. The aquifer hydraulic conductivity is 50 ft/day,
4. The aquifer porosity is 0.15, and
5. The aquifer storage coefficient is 0.0001 (confined conditions),

Using the above assumptions, WinFlow simulates changes in groundwater levels associated with injection through the principal of superposition. Based on this principal, the change in groundwater level at any point in the aquifer is the net sum of the individual injection mounds as if each well were injecting alone.

The aquifer thickness in the model was assumed to be that of the lower aquifer only, which is estimated to extend from 400 ft bgs to 1,400 ft bgs. Aquifer hydraulic conductivity was based on values used in the United States Geological Survey model of the Upper Coachella Valley (Reichard and Meadows, 1992) and is generally consistent with hydraulic conductivities estimated from pumping tests in CVWD and IWA wells. A storage coefficient of 0.0001 was selected to simulate confined aquifer conditions, which is consistent with previous studies of the lower aquifer in the Indio Area (Tyley, 1974).

Analysis of potential changes in groundwater levels associated with recycled water injection at the four well sites was conducted at an assumed total injection rate of 3.3 MGD, which is the total recycled water diversion amount from VSD. Although it is unlikely that the total amount of diverted recycled water will be used in any given year for injection, this volume was used in the simulations to assess a maximum potential impact. Recycled water for injection was apportioned equally between the four injection wells shown on Figure 7, which resulted in an injection rate of 573 gallons per minute (gpm) per well. Injection was also assumed to occur continuously at this rate for a period of one year.

5.2 Results of the Analysis of Potential Changes in Groundwater Levels

Model results of the analysis of potential groundwater level changes from injection show that maximum changes in groundwater levels are expected to be less than 4 ft of rise in the immediate vicinity of the injection wells (see Figure 8). Maximum groundwater level rise at other production wells in the area would range from less than 1 ft to approximately 3 ft. Given that the aquifer system in the Indio Subbasin is in overdraft, any positive change in groundwater levels would be considered beneficial. The analysis shows that the beneficial groundwater rise would be relatively widespread but would not significantly impact groundwater levels in existing wells.

6 Potential Groundwater Quality Impacts

6.1 Regulations Guiding Recycled Water Recharge

Federal and State policies that apply to the use of recycled water for artificial recharge of aquifers include Federal and State Anti-degradation policies and State of California Department of Public Health (DPH) regulations for recycled water reuse. Federal anti-degradation policy, as specified in 40 CFR 131.12, requires individual states to adopt anti-degradation policies to ensure that water quality is maintained and protected. As it is up to the individual states to develop the policy and methods of implementation, further discussion of anti-degradation policy is focused on the policies adopted by California, as described below.

6.1.1 California Anti-degradation Policy

The basic tenets of California's anti-degradation policy are outlined in State Water Resources Control Board (SWRCB) Resolution 68-16, which states:

1. *Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.*

2. *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.*

Implementation of California's anti-degradation policy is delegated to the individual Regional Water Quality Control Boards (RWQCBs) through the issuance of National Pollutant Discharge Elimination System (NPDES) permits. SWRCB guidance for implementation of the anti-degradation policy is outlined in Administrative Procedure 90-04, which outlines different levels of analysis that RWQCBs can require in order to evaluate a proposed project's impact on existing water quality. For projects where the potential impacts on water quality are anticipated to be minor, a "simple" anti-degradation analysis may be required. For projects that have the

potential to significantly increase pollutant loadings to existing water, the RWQCBs can require a "complete" anti-degradation analysis.

For any proposed project that has the potential to alter the existing water quality, it must be demonstrated that the water quality change is consistent with the maximum benefit to the people of the State, and the change is balanced by significant benefits for economic and social development. Factors for consideration include:

1. Past, present and probable beneficial uses,
2. Economic costs to maintain water quality compared to the benefits,
3. Environmental aspects of the proposed discharge, and
4. Consideration of feasible alternative control measures which might reduce, eliminate or compensate for negative impacts to water quality.

6.1.2 Groundwater Quality Standards – Colorado River Basin Region

Established groundwater quality standards by the Regional Water Quality Control Board - Colorado River Basin are specified in the latest version of the Water Quality Control Plan (RWQCB, 2006). Beneficial uses of the groundwater for the Coachella Valley area include municipal, industrial and agricultural uses. Specific groundwater quality objectives include the following:

Taste and Odors – Groundwater for use as municipal or domestic supply shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses as a result of human activity.

Bacteriological Quality – The concentration of coliform organisms shall not exceed the limits specified in California Code of Regulations (CCR) Title 22, Chapter 15, Article 3.

Chemical and Physical Quality – Groundwater shall not contain concentrations of chemical constituents in excess of the limits specified in CCR Title 22, Chapter 15, Article 4, Section 64435, Tables 2, 3 and 4 as a result of human activity.

Brines – Discharges of water softener regeneration brines, other mineralized wastes, and toxic wastes to disposal facilities which ultimately discharge in areas where such wastes can percolate to groundwater useable for domestic and municipal purposes is prohibited.

Radioactivity – Groundwater shall not contain radioactive material in excess of the limits specified in CCR Title 22, Chapter 15, Article 5, Sections 64441 and 64443.

6.1.3 California State Regulations for Groundwater Recharge Using Recycled Water

Regulations for the use of recycled municipal wastewater for groundwater recharge are specified in CCR Title 22, Chapter 3 Recycling Criteria. The regulations are prepared by the DPH and are currently in draft form (the latest version is dated August 5, 2008). The regulations address artificial recharge by both surface spreading and injection wells. Recycled water to be used for artificial recharge must be treated by either filtration or to disinfected tertiary standards as defined in Title 22 Chapter 3. The Project proposes to use advanced treatment including Reverse Osmosis (RO) for the recycled water, which meets the strictest interpretation of filtration as defined in the Recycling Criteria regulations. Further discussion of recycled water recharge requirements are related to this level of treatment.

For general requirements, the draft regulations stipulate that recycled water for a groundwater recharge project must be from a wastewater management agency that administers an industrial pretreatment and source control program. The source control program must include:

1. An assessment of the nature and fate of DPH-identified contaminants;
2. Monitoring programs for DPH-identified contaminants of concern;
3. An outreach program to entities within the agency service area that contribute industrial, municipal and residential wastewater as an effort to control and manage contaminants in the wastewater; and
4. An up-to-date inventory of contaminants discharged into the wastewater collection system so that new contaminants can be readily evaluated.

Prior to implementation of the recycled water recharge program, the responsible agency will be required to conduct a public review and hearing process to specify the details of the project and allow for public comment. The responsible agency will also be required to develop an Operation Plan for the recharge project that describes the operations, management and monitoring that will be required to implement the project. Finally, the agency will be required to develop an engineering report that describes the design of the reclamation project and demonstrates how it will comply with the regulations.

The DPH addresses the control of potential contaminants in the source water for recycled water recharge and downgradient receptors via a number of different engineering and analytical methods. The general categories of contaminants addressed include pathogenic microorganisms,

nitrogen compounds, other regulated chemicals and physical characteristics, and potential other contaminants. Monitoring will be required of both the treated recycled water and the groundwater from monitoring wells that will need to be constructed in the vicinity of the recharge facilities.

Control of Pathogenic Microorganisms

Control of pathogenic microorganisms is addressed through a combination of treatment and residence time in the aquifer system. Treatment can either consist of disinfected tertiary or filtration. The minimum residence time for recycled water in the subsurface is six months. For the purpose of siting artificial recharge facilities (either injection wells or spreading basins), the locations of the facilities must be a distance from existing production wells satisfactory to ensure 12 months' residence time (as analyzed using a calibrated numerical groundwater flow model) or 24 months' residence time (as analyzed using an analytical approach).

Upon construction of injection wells or spreading grounds, the 6-month residence time is assessed through tracer tests and monitoring as outlined in the DPH-approved Operation Plan.

Control of Nitrogen Compounds

Control of nitrogen concentrations in the groundwater near a recycled water recharge facility is accomplished through monitoring and analysis of total nitrogen in the recycled water prior to injection or spreading. Samples must be collected twice a week and analyzed for total nitrogen. Average weekly concentrations exceeding 5 mg/L must be addressed through reduction of nitrogen in the source water. Recycled water recharge would have to be suspended if average total nitrogen concentrations in the recycled water exceed 5 mg/L for four consecutive weeks.

Control of Other Regulated Chemicals and Physical Characteristics

For recycled water treated by RO, samples must be collected weekly for analysis of total organic carbon (TOC). The maximum allowable TOC in the recycled water would be determined based on the recycled water contribution, described below.

Recycled water must be analyzed quarterly for selected inorganic chemicals, radionuclides, organic chemicals, disinfection byproducts, lead and copper. In addition, a sample must be collected annually and analyzed for secondary drinking water constituents. Concentrations exceeding established Maximum Contaminant Levels (MCLs) require confirmation through resampling and analysis. Recycled water recharge must be suspended if the running 4-week average concentration of any constituent exceeds its respective MCL.

Required Monitoring for Other Contaminants

Based on recommendations from the State Water Resources Control Board's Science Advisory Panel, recycled water recharge projects may be required to collect and analyze recycled water samples from a number of chemicals of emerging concern (CECs). The recommendations include monitoring for health-based indicators such as caffeine, NDMA, 17b-estradiol, and others. It is unclear if and when these recommendations will be added to the monitoring requirements for artificial recharge projects.

Diluent Requirements/Recycled Water Contribution

Recycled water must be blended with another source of potable water prior to introduction into the subsurface via injection wells or spreading facilities. The blend water is referred to as "diluent" water and can come from a number of sources (e.g. imported water) as long as it meets certain water quality criteria. Underflow through the area is also considered a diluent water source. The percentage of recycled water in the blend is referred to as the recycled water contribution (RWC). The maximum initial RWC for recharge projects utilizing surface spreading basins and injection wells is 0.5 (50 percent) if the recycled water is treated with RO. This RWC is calculated as a 60 month rolling average. The RWC can be increased over time as long as certain monitoring requirements and analytical results are met.

Required Reporting

The DPH and RWQCB will require submittal of analytical results of recycled water monitoring on a monthly basis. Water quality results exceeding MCLs or total coliform requirements must be reported within 48 hours of receiving the results. Annual reports of recycled water recharge operations must be submitted to the DPH and RWQCB. In addition, the engineering report for the project must be updated every five years.

6.2 Potential Impacts of Recycled Water Recharge on Groundwater Quality

Recycled water diverted from the VSD treatment plant for artificial recharge would be further treated through a combination of advanced treatment processes prior to injection at the ASR wells. This advanced treatment process includes microfiltration, ultrafiltration, RO, and finally disinfection by ultraviolet advanced oxidation. The resulting TDS of the recycled water would be less than 100 mg/L and other constituents, including general minerals and ions, metals, bacteria, and organic compounds (including TOC) would be reduced to very low concentrations and, in most cases, below detection levels. The resulting water quality would be superior to the

native groundwater, thereby satisfying both SWRCB anti-degradation policy and RWQCB basin plan objectives.

6.3 Analysis of Potential Recycled Water Travel Times

Recycled water travel times in the aquifer were evaluated using a modified version of the WinFlow model described in Section 5.1. All aquifer parameter values used in the analysis of potential groundwater level changes (i.e. aquifer thickness, hydraulic conductivity, storage coefficient, etc.) were used in the analysis of recycled water travel times. The primary difference for this analysis was the incorporation of groundwater levels resulting in a representative gradient and flow direction. Simulated groundwater levels were calibrated to groundwater levels measured in November 2010, as shown on Figure 4. The calibration resulted in a relative error[1] of approximately 7 percent, which is considered acceptable for the analysis (see Table 4).

Recycled water travel times were analyzed using the particle tracking feature in the calibrated WinFlow model. Particle tracking provides an analytical expression of a water "particle's" flow path and travel time from the points of origin, which in this case are the injection wells. Particle tracking accounts for advective groundwater flow only and does not take into account dispersion or other aquifer transport mechanisms. However, it provides a conservative estimate of the migration rate and direction of flow of the injected water.

Two-year particle traces for each conceptual injection well are shown on Figure 8. As shown, injected recycled water would not reach any downgradient production wells within two years of injection. This satisfies the DPH's requirement of a 24-month recycled water residence time for the control of pathogenic organisms, as described in Section 6.1.3.

[1] Relative error is the standard deviation of the residuals (difference between measured and model-generated groundwater levels) divided by the range in measured hydraulic head across the model area.

7 Summary of Findings

The principal findings of the evaluation of potential groundwater impacts are as follows:

- The IWA is proposing to divert recycled water generated at the VSD WWTP for beneficial uses that include irrigation and artificial recharge of the groundwater system;
- The groundwater system has been categorized into perched, upper and lower aquifers, each separated by low permeability silt and clay layers;
- The upper and lower aquifer systems are both in a state of overdraft, whereby groundwater pumping is currently exceeding recharge resulting in dropping groundwater levels;
- Artificial recharge of the groundwater system would be focused on the lower aquifer system in order to benefit IWA's wells, which are perforated within this aquifer;
- In order to recharge the lower aquifer system, it will be necessary to use injection wells that are perforated in the lower aquifer;
- Four potential injection well locations were identified in areas that are upgradient of most of IWA's wells and in areas where there are existing pumping depressions (see Figure 7). Other criteria for selection of injection well sites included proximity to proposed recycled water pipeline and adequate distance from existing wells so as to satisfy DPH recycled water travel times in the aquifer;
- Although recycled water recharge would likely be limited to certain periods of the year when irrigation demand was low, evaluation of potential groundwater level impacts was conducted using the maximum amount of available recycled water (3.3 MGD) and assumed recharge for a full year to assess the maximum potential impact;
- The results of the analysis of groundwater level impacts shows a maximum positive change (i.e. rise) of approximately 3.5 ft in the immediate vicinity of the injection wells;
- Potential changes in groundwater levels at other area wells would range from less than 1 ft to approximately 3 ft;
- Positive changes in groundwater levels are considered a benefit in that they help mitigate the effects of regional overdraft in the aquifer system;
- Evaluation of potential groundwater quality impacts from the artificial recharge of recycled water are based on advanced treatment of the recycled water, which results in a recycled water quality that is superior to that of the native groundwater;
- Using advanced treated recycled water, the artificial recharge program does not violate Federal and State anti-degradation policy and meets the requirements of the RWQCB's Water Quality Control Plan;

- Implementation of the recycled water recharge project would include certain requirements from the California DPH, including a public hearing process, development of both operation plans and engineering reports, blending water requirements (initially the injection water must be a 50:50 blend of recycled water and water from another approved source), and monitoring and reporting; and
- Analysis of potential recycled water travel times at the proposed injection well locations shows that the injected water would not reach any existing production wells within two years of introduction into the aquifer, thus satisfying DPH requirements for siting injection wells.

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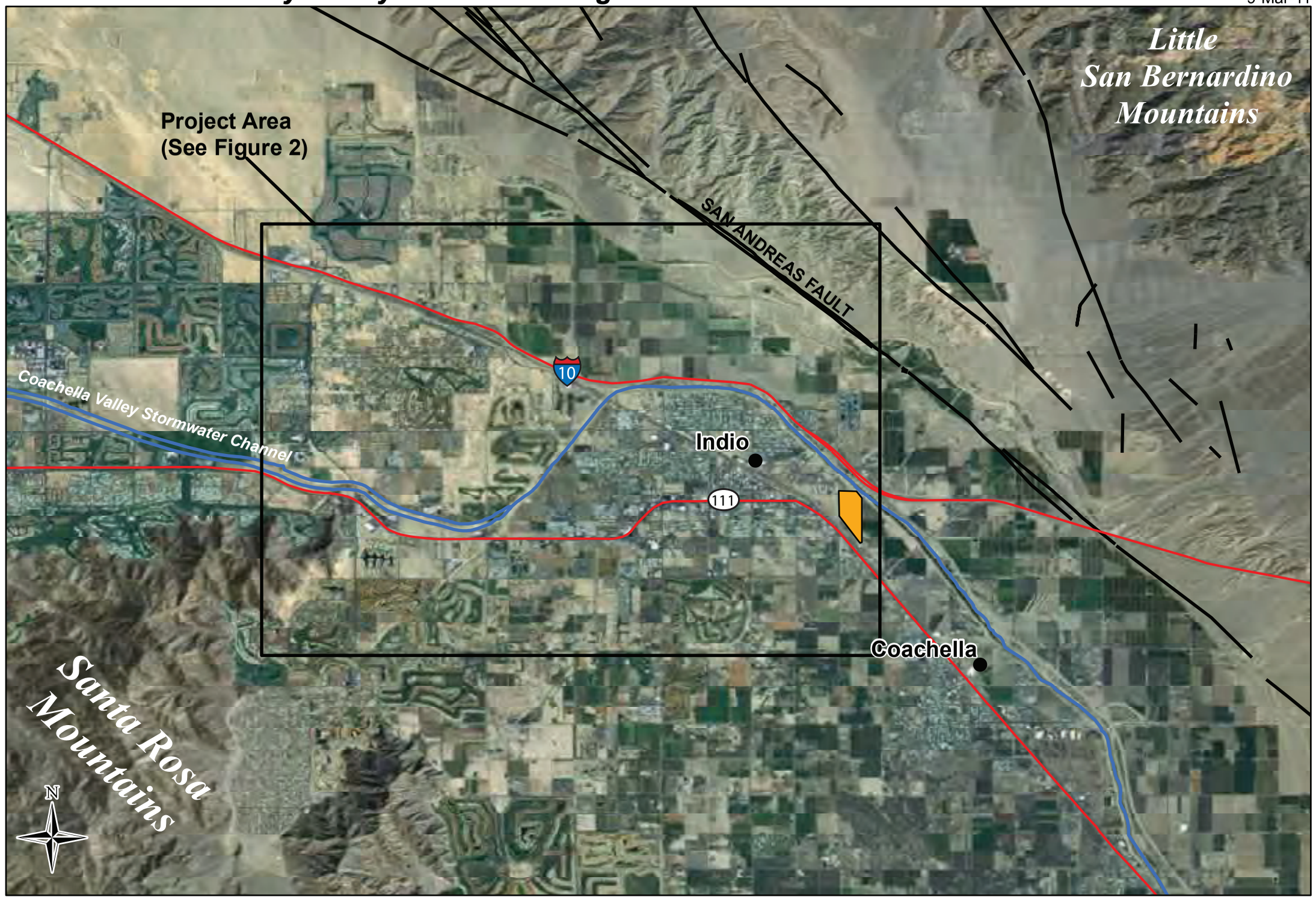
9-Mar-11

Evaluation of Potential Groundwater Impacts



0 1 2 4 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- Valley Sanitary District Wastewater Treatment Plant
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Regional Setting

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Regional Map
Figure 1

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9-Mar-11

Evaluation of Potential Groundwater Impacts

0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- IWA Production Wells
- CVWD Monitoring Wells
- CVWD Production Wells
- Other Wells
- VSD WWTP
- Cross Section A-A'
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

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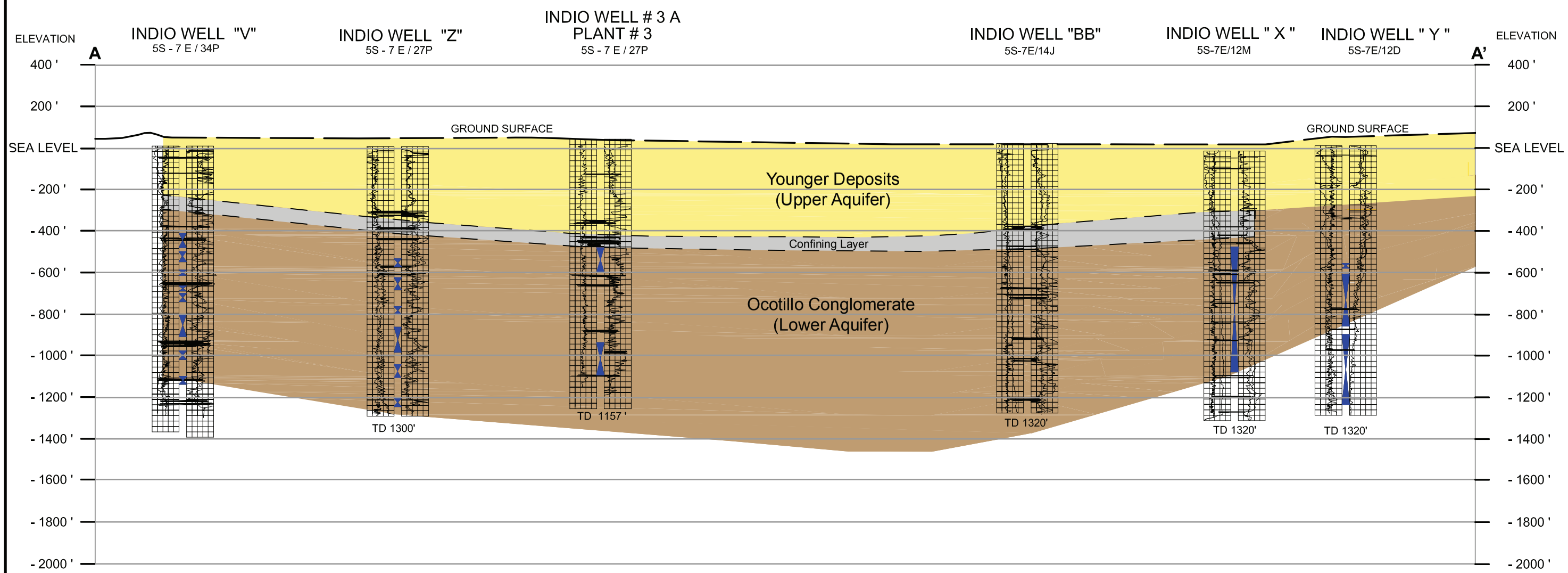
Project Area with Existing Wells
Figure 2

9-Mar-11



TD = Total Depth

Sources of Data: - Modified from R.C. Slade Associates, 2007
- DWR, 1964

DRAFT

Hydrogeologic Cross Section A - A'

Figure 3

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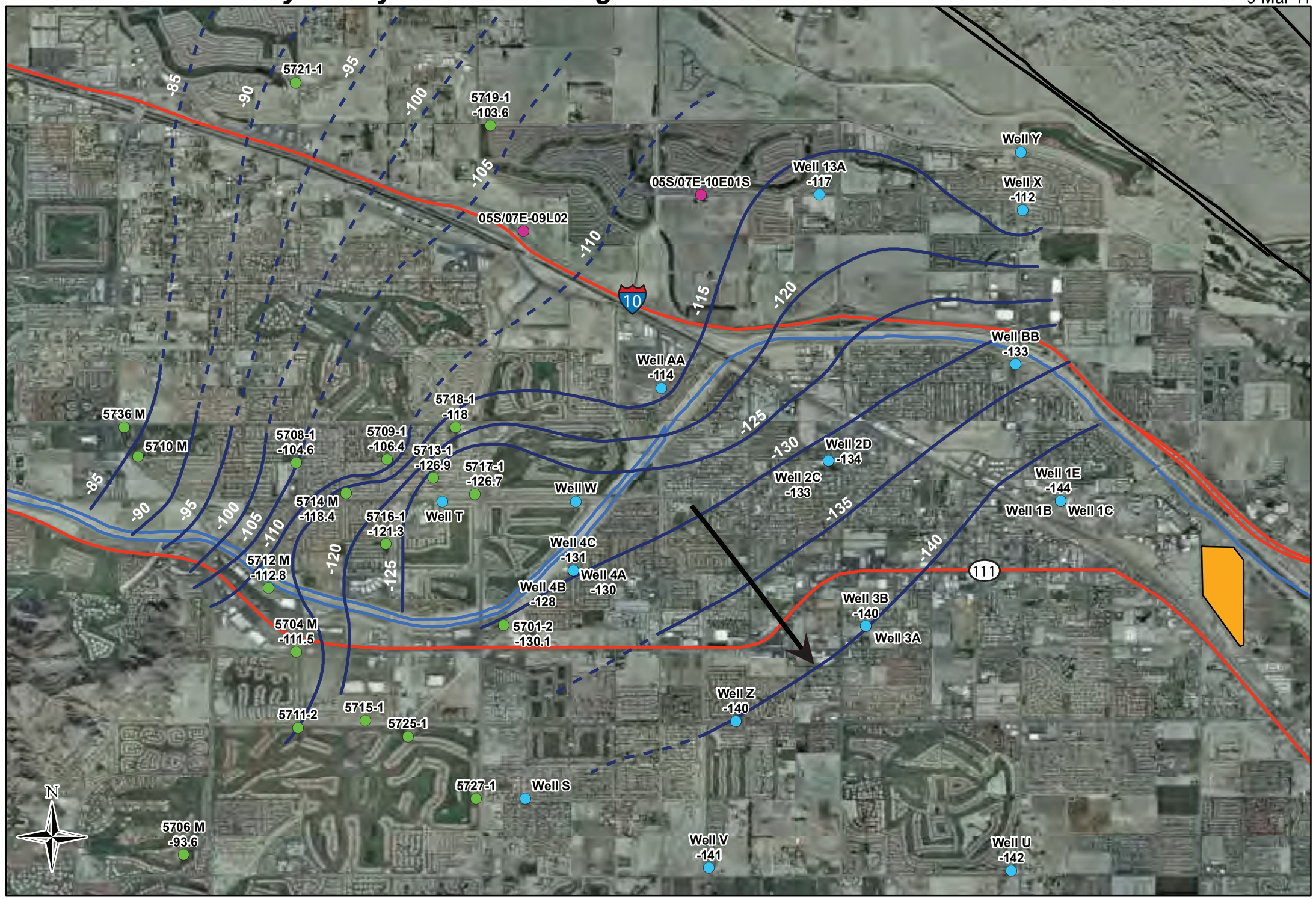
9-Mar-11

Evaluation of Potential Groundwater Impacts



0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- IWA Wells
- CVWD Wells
- Other Wells
- VSD WWTP
- 5 ft Groundwater Elevation Contour (amsl) (dashed where approximate)
- Groundwater Flow Direction
- Coachella Valley Stormwater Channel
- Highways
- Faults

Note: Groundwater Levels measured in October and November 2010

Basemap Source: www.esri.com

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Groundwater Level Contour Map- Lower Aquifer

Figure 4

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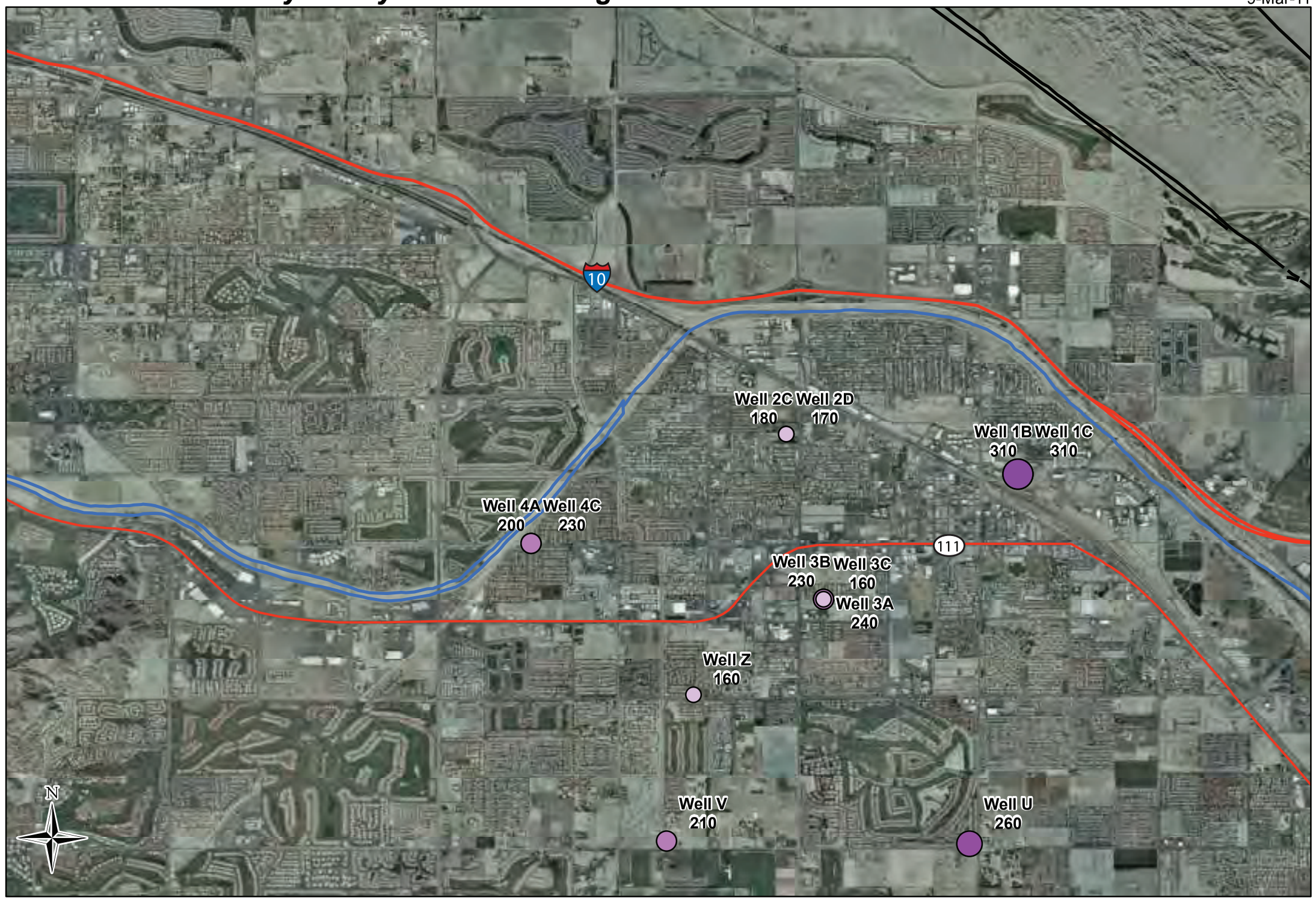
9-Mar-11

Evaluation of Potential Groundwater Impacts



NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

Total Dissolved Solids (TDS) (mg/L)

- < 200
- 200-249
- 250-299
- > 300
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Data collected 9-Sep-10 for Wells 1B, 1C,3A,3B,3C,V, and Z

Data collected 1-Oct-10 for Wells 2C, 2D,4A, and U

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Total Dissolved Solids (TDS) Concentrations in Groundwater

Figure 5

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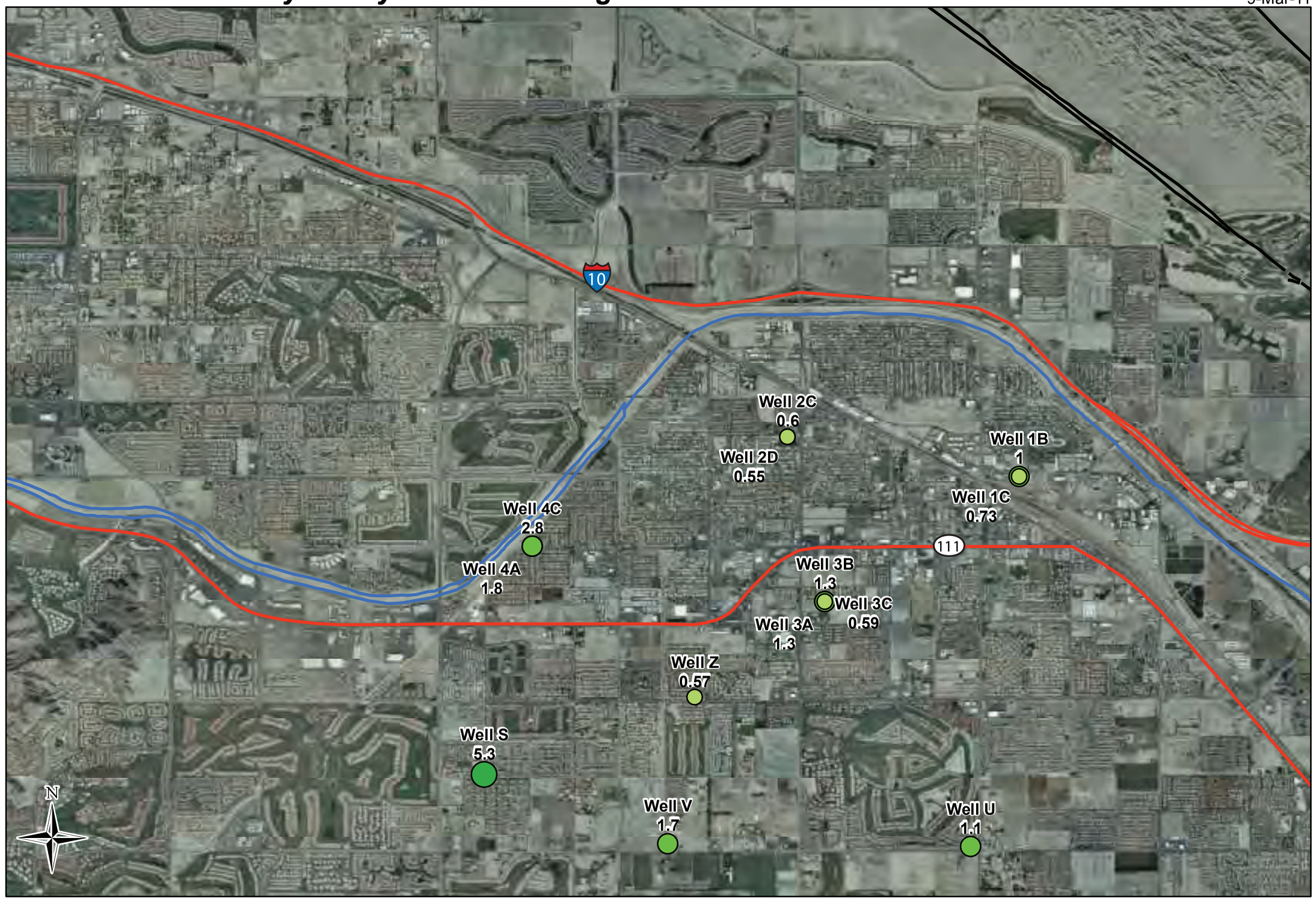
Evaluation of Potential Groundwater Impacts



NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

Nitrate as N (mg/L)

- < 1
- 1.0-2.9
- > 3.0
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Data Collected 28-Jul-10 for Well S

Data collected 9-Sep-10 for Wells 1B, 1C,3A,3B,3C,V, and Z

Data collected 1-Oct-10 for Wells 2C, 2D,4A, and U

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Nitrate Concentrations in Groundwater

Figure 6

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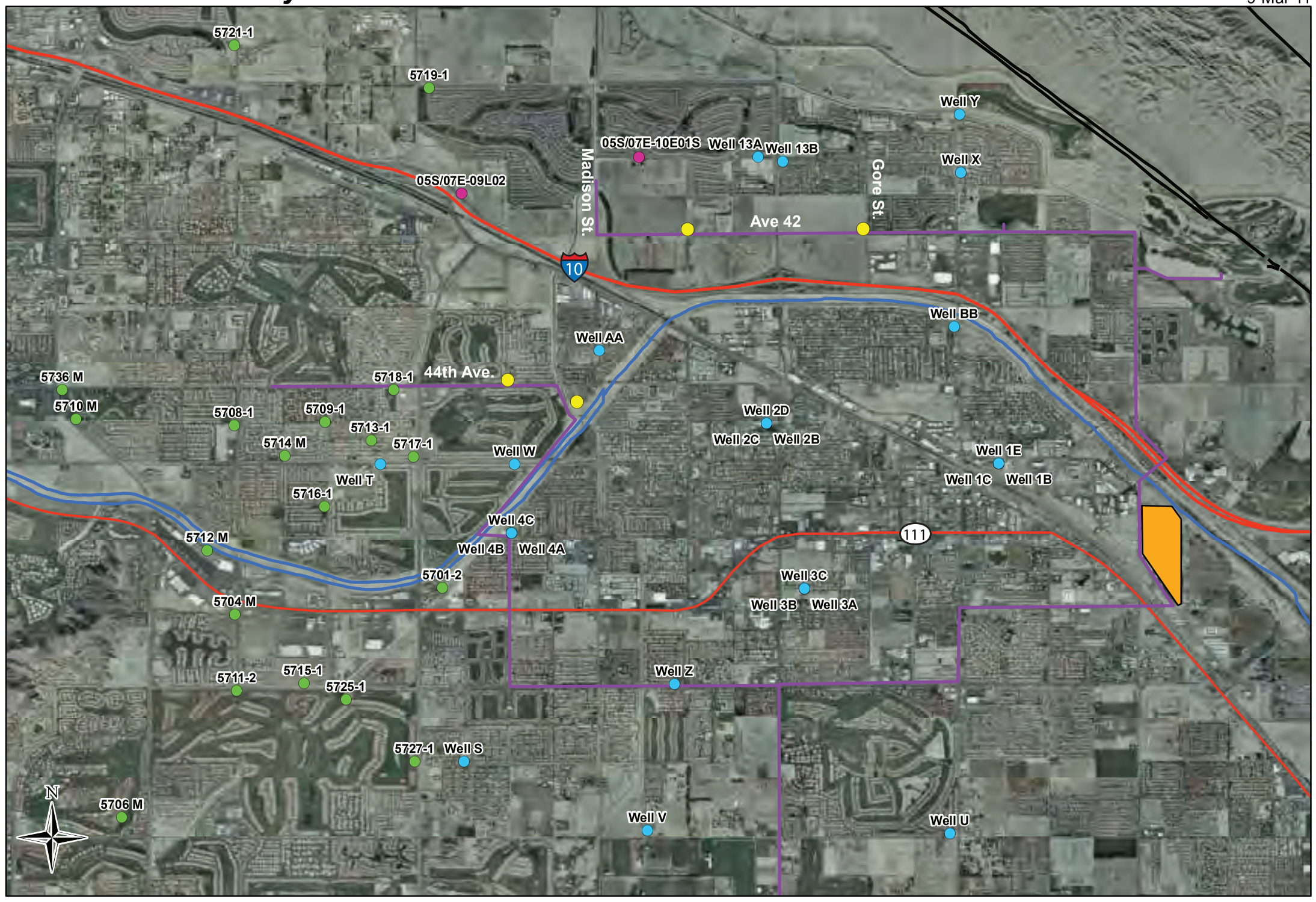
9-Mar-11

Indio Recycled Water Recharge Project



0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- Proposed Injection Wells
- IWA Wells
- CVWD Wells
- Other Wells
- VSD WWTP
- Proposed Recycled Water Transmission Main
- Coachella Valley Stormwater Channel
- Highways
- Faults

Basemap Source: www.esri.com

Transmission Main location from Carollo TM No. 1 Final, January 2010

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Proposed Recycled Water Program Features

Figure 7

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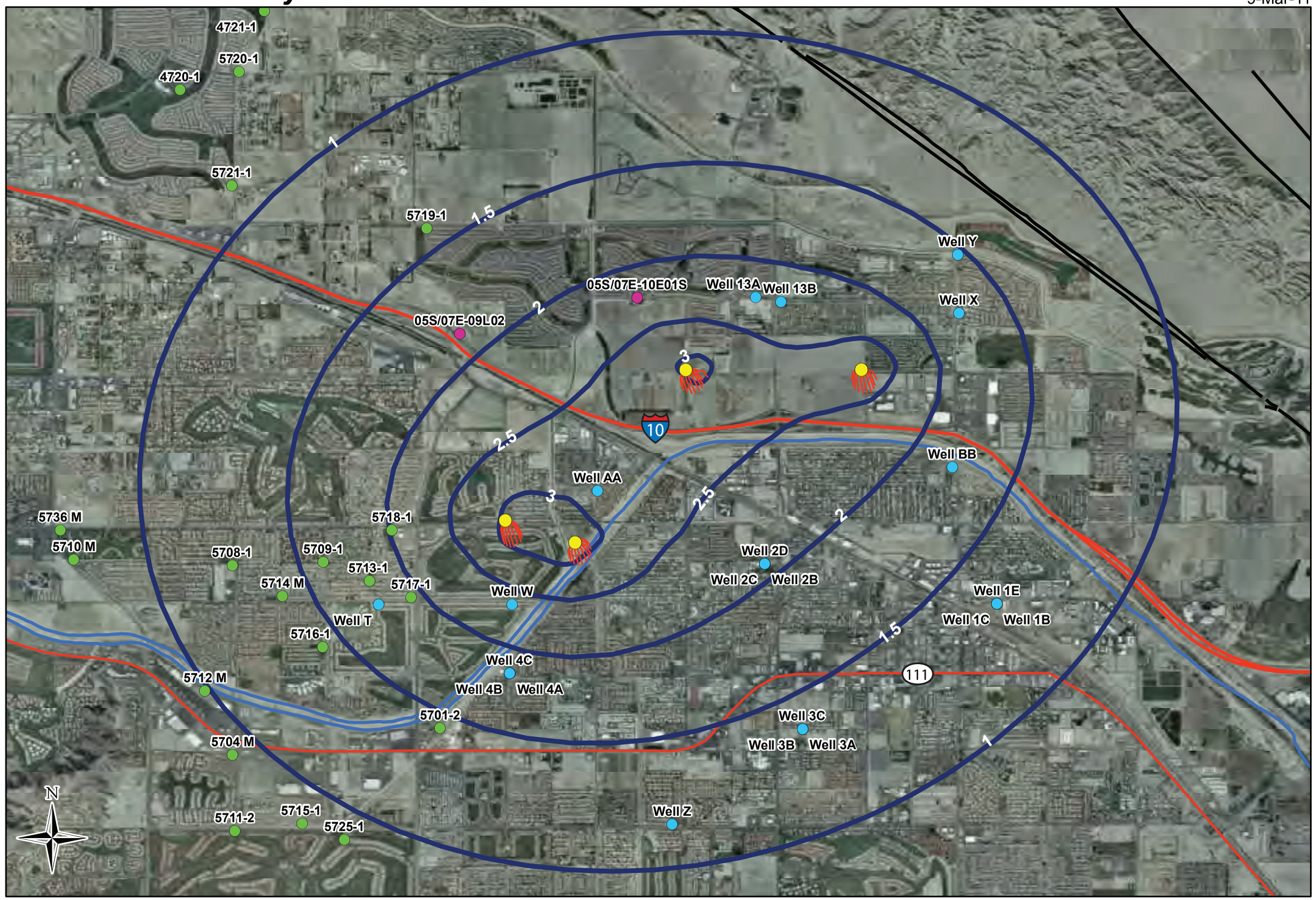
Indio Water Authority

9-Mar-11

Indio Recycled Water Recharge Project



0 0.5 1 2 Miles

NAD 83 UTM Zone 11
Central Meridian: -117

Map Features

- Proposed Injection Wells
- IWA Wells
- CVWD Wells
- Other Wells
- Lines of Equal Change in Groundwater Level (ft)
- Two Year Particle Trace*
- Coachella Valley Stormwater Channel
- Highways
- Faults

* The two-year prarticle trace is the predicted distance injected recycled water would travel in two years following introduction to the aquifer.

Basemap Source: www.esri.com

DRAFT

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Groundwater Consulting

Simulated Change in Groundwater Levels

Figure 8

Summary of Well Construction Details
Indio Water Authority Wells

Well Name	Total Depth (ft)	Screen Interval (s) (ft bgs)[1]	Aquifer(s)
1A	500	205-422, 430-500	Upper/Lower
1B	410	190-410	Upper/Lower
1E	660	250-350,510-660	Upper/Lower
2A	882	485-699, 702-882	Lower
2B	1100	506-1100	Lower
2C	1152	480-1152	Lower
2D	1205	500-575,595-670,715-797, 880-930, 1050-1095, 1120-1200	Lower
3A	1157	515-630,970-1130	Lower
3B	1200	500-580,700-780,980-1200	Lower
3C	1100	515-630, 970-1110	Lower
4B	1170	460-720,810-1040,1100-1150	Lower
V	N/A	400-470,490-530,570-800,650-670,680-720,780-880,950-990	Lower
X	N/A	610-630,660-910,950-1280	Lower
Y	N/A	500-1000	Lower
Z	N/A	570-610,660-720,790-830,880-1130,1090-1150,1240-1280	Lower

Note:

[1] ft bgs = Feet below ground surface.

Summary of Groundwater Levels In The Project Area

Well Name	Date Measured	Ground Surface Elevation (ft amsl)[1]	Depth to Groundwater (ft bgs)[2]	Groundwater Elevation (ft amsl)[1]	Aquifer
IWA Well 1E	11-16-10	-20	124.0	-144	Upper/Lower
IWA Well 1B	11-16-10	-19	64.0	-83	Upper/Lower
IWA Well 1C	11-16-10	-20	64.0	-84	Unknown
IWA Well 2C	11-16-10	1	134.0	-133	Lower
IWA Well 2D	11-16-10	1	135.0	-134	Lower
IWA Well 3A	11-22-10	1	138.0	-137	Lower
IWA Well 3B	11-22-10	1	141.0	-140	Lower
IWA Well 4A	11-17-10	36	166.0	-130	Unknown
IWA Well 4B	11-17-10	36	164.0	-128	Lower
IWA Well 4C	11-17-10	36	167.0	-131	Unknown
IWA Well AA	11-16-10	13	127.0	-114	Unknown
IWA Well BB	11-16-10	-12	121.0	-133	Unknown
IWA Well T	11-16-10	72	208.0	-136	Unknown
IWA Well U	11-17-10	-7	135.0	-142	Unknown
IWA Well V	11-22-10	12	153.0	-141	Lower
IWA Well W	11-16-10	38	119.0	-81	Unknown
IWA Well X	11-17-10	8	120.0	-112	Lower
IWA Well Y	11-17-10	39	111.0	-72	Lower
IWA Well Z	11-22-10	13	153.0	-140	Lower
IWA Well 13A	11-16-10	21	138.0	-117	Unknown
CVWD 5704 M	11-17-2010	69.5	181.0	-111.5	Unknown
CVWD 5706 M	10-27-2010	46.9	140.5	-93.6	Unknown
CVWD 5710 M	10-29-2010	136.4	220.3	-83.9	Unknown
CVWD 5712 M	11-10-2010	76.3	189.1	-112.8	Unknown
CVWD 5714 M	11-18-2010	81.4	199.8	-118.4	Unknown
CVWD 5736 M	10-29-2010	141.2	229.1	-87.9	Unknown
CVWD 4720-1	10-25-2010	86.0	172.3	-86.3	Unknown
CVWD 4721-1	10-5-2009	89.6	155.8	-66.2	Unknown
CVWD 4722-1	10-26-2010	96.9	176.1	-79.2	Unknown
CVWD 5701-2	11-17-2010	46.4	176.5	-130.1	Unknown
CVWD 5708-1	11-10-2010	89.6	194.2	-104.6	Unknown
CVWD 5709-1	11-18-2010	76.9	183.3	-106.4	Unknown
CVWD 5711-2	11-10-2011	59.6	199.5	-139.9	Unknown
CVWD 5713-1	11-18-2010	74.1	201.0	-126.9	Unknown

Summary of Groundwater Levels In The Project Area

Well Name	Date Measured	Ground Surface Elevation (ft amsl)[1]	Depth to Groundwater (ft bgs)[2]	Groundwater Elevation (ft amsl)[1]	Aquifer
CVWD 5715-1	3-17-2010	55.9	177.4	-121.5	Unknown
CVWD 5716-1	11-10-2010	61.6	182.9	-121.3	Unknown
CVWD 5717-1	11-10-2010	48.9	175.6	-126.7	Unknown
CVWD 5718-1	11-10-2010	52.6	170.6	-118	Unknown
CVWD 5719-1	10-26-2010	51.5	155.1	-103.6	Unknown
CVWD 5720-1	10-26-2010	111.4	183.3	-71.9	Unknown
CVWD 5721-1	2-9-2010	88.4	158.0	-69.6	Unknown
CVWD 5725-1	5-28-2010	53.8	191.0	-137.2	Unknown
CVWD 5727-1	5-28-2010	43.8	184.5	-140.7	Unknown

Note:

[1] ft amsl = Feet above mean sea level.

[2] ft bgs = Feet below ground surface.

Summary of Selected Water Quality Constituents
Indio Water Authority Wells

Well Name	Total Dissolved Solids (mg/L)[1]	Nitrate as Nitrogen (mg/L)[1]
Well 1B	310*	1.0*
Well 1C	310	0.73
Well 2C	180	0.60
Well 2D	170	0.55
Well 3A	240	1.3
Well 3B	230	1.3
Well 3C	160	0.59
Well 4A	200	1.8
Well 4C	230	2.8
Well S	N/A	5.3
Well U	260	1.1
Well V	210	1.7
Well Z	160	0.57

Note:

[1] mg/L = Feet above mean sea level.

* Sample dates in September 2010 for all wells except Well S; Well S sampled in July 2010

Comparison of Observed and Model-Predicted Groundwater Levels

Well Name	Observed Groundwater Elevation (ft amsl)	Predicted Groundwater Elevation (ft amsl)	Residual (ft)
5710 M	-83.9	-88.6	4.7
4722-1	-79.2	-73.1	-6.1
4720-1	-86.3	-76.8	-9.5
5719-1	-103.6	-99.4	-4.2
13A	-117.0	-118.9	1.9
5736 M	-87.9	-86.0	-1.9
5708-1	-104.6	-110.9	6.3
5714 M	-118.4	-112.1	-6.3
5709-1	-106.4	-118.7	12.3
5718-1	-118.0	-123.5	5.5
5716-1	-121.3	-124.0	2.7
5713-1	-127.0	-127.5	0.5
5717-1	-126.7	-130.8	4.1
5712 M	-112.8	-106.0	-6.8
5704 M	-111.5	-109.9	-1.6
5701-2	-130.1	-132.5	2.4
4A	-130.0	-150.1	20.1
AA	-114.0	-130.3	16.3
2C	-133.0	-140.9	7.9
3B	-140.0	-143.3	3.3
Z	-140.0	-143.0	3.0
V	-141.0	-140.4	-0.6
BB	-133.0	-131.5	-1.5
X	-112.0	-110.9	-1.1
1E	-144.0	-155.3	11.3

Residual Mean	2.50
Residual Standard Deviation	7.04
Change in Head over Model Area	103 ft
Relative Error	6.83%

Note:

[1] ft amsl = Feet above mean sea level.

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7/2/10

CITY OF INDIO
INDIO WATER AUTHORITY
WATER RECLAMATION FACILITIES FOR REUSE AND GROUNDWATER RECHARGE – PHASE 1 ENVIRONMENTAL PROGRAM

TECHNICAL MEMORANDUM NO. 1
MARKET AND DEMAND ASSESSMENT

January 2010

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CITY OF INDIO / INDIO WATER AUTHORITY
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MARKET AND DEMAND ASSESSMENT

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MARKET AND DEMAND ASSESSMENT

1.0 INTRODUCTION

This technical memorandum (TM) is prepared for the Indio Water Authority (IWA) in partial fulfillment of the agreement between the IWA and Carollo Engineers entitled "Water Reclamation Facilities for Reuse and Groundwater Recharge – Phase I Environmental Program. This TM presents the results of a market and demand assessment of the potential large recycled water customers that could use recycled water produced by the Valley Sanitary District (VSD) wastewater treatment plant (WWTP). Task 2 of the scope of work is accomplished with this TM and includes the tasks summarized below:

- Task 2.1 – Identify major turf irrigation customers that may become reuse irrigation customers.
- Task 2.2 – Quantify the amount of water that is used by these potential recycled water customers.
- Task 2.3 – Conduct a field investigation of the major customers to identify issues that may need to be addressed to provide recycled water, and to identify potential connection locations.
- Task 2.4 – Prepare a map showing IWA and VSD boundaries, potential large reuse customer locations, and the location of a backbone piping system to deliver the recycled water.

2.0 POTENTIAL CUSTOMERS

Large water users for irrigation in Indio include golf courses, polo clubs, parks, and homeowner's associations (HOAs). Potential recycled water customers were obtained by reviewing customer lists from previous studies, dicussions with IWA staff, and reviewing aerial photographs. A list of possible large recycled water users was developed, and site visits were made to those water users who responded to telephone inquiries. In addition to the customers that have been identified in this TM, there are several turf areas at schools that are large enough to be considered potential small recycled water customers. Table 1 lists the potential large customers and their contact information, where available.

Table 1 Potential Recycled Water User Contact Information

Name	Contact Name	Telephone Number	Address	Golf Course Size
Heritage Palms Golf Club1	Robert (Bob) White	**760-265-7447** 760-772-7334	44-291 Heritage Palms Drive South, Indio, CA 92201-2713	18-hole, 6,727 yards
Indio Municipal Golf Course	Kerry Lee	**760-578-9241** 760-347-9156	83-040 Avenue 42 Indio, CA 92201	18-hole, 3,004 yards
Rancho Casa Blanco Country Club & HOA	Mr. Stone	**760-342-9866** 760-347-1999	84-136 Avenue 144, Indio, CA 92203	18-hole, 1,302 yards
Terra Lago Golf Club	Tom Russell	**760-464-8151**, 760-775-2000	84-000 Landmark Parkway, Indio, CA 92203	36-hole, 14,352 yards
Indian Palms Country Club		**760-342-3432**, 760-775-4448	48-630 Monroe Street, Indio, CA 92201	27-hole, 10,061 yards
Indian Springs Country Club	Alfredo Alcocer	**760-772-4077** 760-200-8988	79-940 Westward Ho Drive, Indio, CA 92201	18-hole, 6,404 yards
Plantation Golf Club	Scott Sandals	**760-342-4363** 760-775-3688	50994 Monroe Street, Indio, CA 92201	18-hole, 7,093 yards
Bermuda Dunes Golf Course and Country Club	Darin Carlyle	760-902-3132	42-360 Adams Street, Bermuda Dunes, CA 92203	27-hole
Eagle Falls Golf Course	Willie Maples, or Sergio	760-423-9107, 760-238-5635	840245 Indio Springs Parkway, Indio, CA 92203	18-hole
Shadow Hills Golf Course (Sun City)		760-200-3375	80-875 Avenue 40, Indio, CA 92203-9439	18-hole
Empire Polo Club	David Nolasco, Robert E. del Mas	760-347-7448	81-800 Avenue 51, Indio, CA 92201	N/A
Eldorado Polo Club	Jan Hart	760-342-2223 x224, 760-702-6911	50950 Madison Street, Indio, CA 92201	N/A
Indio Parks including Posse Park	Paul Stalma	760-391-4140	N/A	N/A
Desert Shores RV Lot Resales HOA		760-775-9808	48170 Hjorth Street Indio, CA 92201	N/A
Outdoor Resort Indio HOA		760-775-7255	80-394 Avenue 48 Indio, CA 92201	18-hole
Unknown HOA				N/A

3.0 WATER DEMANDS FOR POTENTIAL RECYCLED WATER CUSTOMERS

Water supply and irrigation demand information was obtained from interviews and discussions with golf course and other staff where possible. Where water usage information could not be obtained directly, estimates were made based on the water usage of other similar water users.

Table 2 shows the estimated irrigation water demand and peak flow rate for each potential customer. Water sources currently used by these potential customers have been identified where known. Most golf courses have their own well(s) and some use water from the Coachella Canal to supplement well water use. The Coachella Canal is a branch of the All-American Canal conveying Colorado River Water.

Peak flows have been identified where known. Peak flows are important to size pipes and pumping facilities. Where the pumping capacity of the pump stations at the golf courses is known, this pumping capacity is used for the peak flow rate. Where the pumping capacity is not known, the peak flow is estimated by calculating the peak daily irrigation demand and assuming that this volume of water is applied during the 11 hour period per day that golf course irrigation systems typically operate.

Seasonal demand information was obtained for typical water use on golf courses in the arid southwestern United States where overseeding takes place in the fall. Figure 1 shows this estimated seasonal water usage pattern. The average annual water usage is multiplied by the demand factor associated with a particular month to predict the water usage for that month. Figure 1 also shows the normalized VSD recycled water supply for a 12-month period to show that water supply availability does not correspond to water demands. Seasonal aquifer storage would be required to effectively utilize all recycled water for irrigation. Table 3 shows the demand factors used for Figure 1.

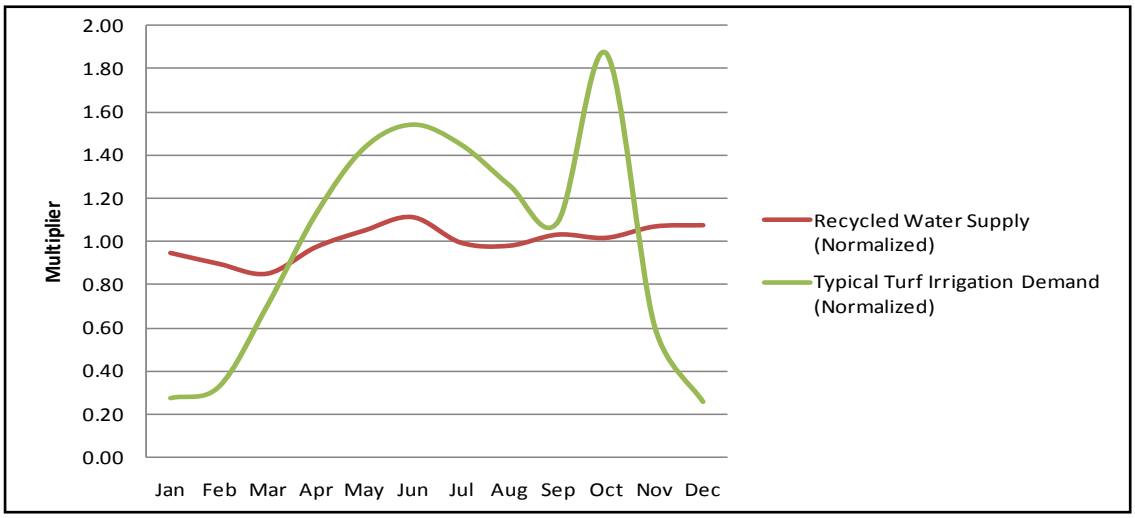


Figure 1 ***Monthly Irrigation Demand Pattern for Turf in the Arid Southwest with Fall Overseeding Compared to Valley Sanitary District Recycled Water Supply***

Table 2 Water Demands and Current Water Sources for Potential Recycled Water Customers

Name	Current Water Source			Area	Estimated Water Consumption			
	City Potable Water	Private Well	Coachella Canal	Acres	Annual Water Use, acre-ft.	Annual Water Demand	Maximum hours/day for Irrigation	Maximum Flow Rate
Heritage Palms Golf Club	minor	October	11 months	175	1,600	9.14 ft.	12	2,700 gpm
Indio Municipal Golf Course	No	Yes	No	38	358	11.20 ft.	8	700 gpm
Rancho Casa Blanco Country Club & HOA	No	Yes	No	13	117	9.00 ft.	8	200 gpm
Terra Lago Golf Club	No	No	Yes	192	1,728	9.00 ft.	12	2,700 gpm
Indian Palms Country Club	No	2 private wells	None	210	1,865	8.90 ft.	10	3,200 gpm
Indian Springs Country Club	No	Yes	Not Now, Yes in future	125	750	6.00 ft.	5	1,500 gpm
Plantation Golf Club	No	Yes	Yes, 90%	180	972	5.4 ft. from canal, 9.0 ft. total (approx.)	7	3,600 gpm
Bermuda Dunes Golf Course and Country Club	No	Yes	No	180	1,260	7 ft.	10	3,500 gpm
Eagle Falls Golf Course	No	Yes	Unknown	123	1,107	9 ft.	10	3,000 gpm
Shadow Hills Golf Course (Sun City)	No	Unknown	Yes	220	1,760	8.00 ft.	10	2,700 gpm
Empire Polo Club	No	Yes	Yes	421	2,950	7 ft.	10	4,200 gpm
Eldorado Polo Club	No	Yes	Yes			7 ft.	10	4,200 gpm
Indio Parks including Posse Park	Yes	No	No	83	500	6 ft.	10	1,000 gpm
Desert Shores Resales HOA	Unknown	Unknown	No	20	140	7 ft.	10	400 gpm
Outdoor Resort Indio HOA	Unknown	Unknown	No	24	168	7 ft.	10	475 gpm
Unknown HOA	Unknown	Unknown	No	16	112	7 ft.	10	320 gpm
Total					**15,387**			

Table 3 Monthly Water Supply and Irrigation Demand Peaking Factors used on Figure 1		
Month	**Monthly Recycled Water Supply Peaking Factor**	**Irrigation Demand Seasonal Peaking Factor**
Jan	0.95	0.28
Feb	0.90	0.33
Mar	0.85	0.71
Apr	0.97	1.13
May	1.05	1.43
Jun	1.11	1.54
Jul	0.99	1.45
Aug	0.98	1.26
Sep	1.03	1.09
Oct	1.02	1.87
Nov	1.07	0.61
Dec	1.08	0.26

Table 4 shows a comparison of the volume of recycled water that is available currently, and anticipated at buildout. VSD delivers 1 mgd to the wetlands treatment system located at the plant site. Required minimum discharge flows to the drainage channel have not been established, but are currently estimated to be 2 mgd. Therefore, the current average flow rate that may be available for irrigation is 3.3 mgd. Peak flow rates are expected to be as high as 4 mgd.

Table 4 Recycled Water Supply Compared with Potential Irrigation Demand				
Flow Condition	**Current, mgd**	**Current, acre-ft/yr**	**Ultimate, mgd**	**Ultimate, acre-ft/yr**
Average Annual Flow Rate from the VSD WWTP	6.3	6,984	16	17,924
Wetlands Treatment Project	1	---	1	---
Assumed Minimum VSD WWTP Discharge to the Channel	2	---	2	---
Available Average Recycled Water Irrigation Flow Rate	3.3	3,697	13	14,563
Estimated Peak Daily Recycled Water Irrigation Flow Rate (Average * 1.2)	4.0	---	15.6	---
Potential Average Annual Irrigation Water Demand	---	15,387	---	15,387
Note: Peak irrigation flow rates are a function of the specific customers that are scheduled to use water at any given time, and would need to be managed within the limits of both water supply and water delivery infrastructure.				

The total potential irrigation demand of 15,387 acre-ft/year is higher than the current recycled water availability. The total recycled water supply of 14,563 acre-feet that is available for irrigation at buildout is also less than the potential irrigation demand if the assumed 2 mgd is discharged to the channel. Therefore, the Coachella Canal and groundwater will still provide irrigation supply even when recycled water is available.

4.0 FIELD RECONNAISSANCE

4.1 Interview Notes

The following is a summary of the discussions with potential recycled water customers that responded to requests for information.

1. **Heritage Palms Golf Club** – This golf club is interested in using recycled water. The golf course has ponds that can be filled from a well or from the Coachella Canal. The ponds are designed such that most of the canal sediment is removed in a small pond before the water moves to a large storage pond adjacent to the golf course fairways. A water level monitoring system automatically controls the amount of canal water that enters the pond. Although these ponds can be used to store recycled water for irrigation, a preferred method of delivery would be to provide recycled water that is pressurized to approximately 95 psi so that re-pumping would not be necessary. The preferred location for a connection to the irrigation system would be where the sediment pond and pump station are co-located. Recycled water contains nitrogen and phosphorous that improves turf growth, but may create undesirable algae growth in storage ponds. Well water is used primarily for overseeding because the well water has lower salt levels so the new grass grows more readily. Although good turf can be grown in this area by applying 7 acre-ft/acre/year of water, 9 acre-ft/acre/year is applied at this golf course for salt leaching.
2. **Indio Municipal Golf Course (i.e., Posse Park located adjacent to the east of golf course)** – The irrigation system in this golf course is old, and the City plans to upgrade the irrigation system in 2010, so the City could install a purple pipe system for recycled water at that time. The current pumping rate of the existing pump station is less than desired, so a larger pump station would be preferred. In addition to the 32 irrigated acres, the city has approximately 10 acres of un-developed land around the golf course that could be used to place injection wells. Chlorine levels in the recycled water are a concern, particularly if superchlorination is a possibility, because the chlorine will kill or damage some plant life. Although recycled water could be introduced into the pond on this golf course, the pond already has problems with algae blooms and other undesirable plant growth and recycled water would exacerbate the problem. A pressurized system is preferred to eliminate re-pumping. The preferred location for recycled water to be delivered would be at the pond.
3. **Rancho Casa Blanca Country Club and HOA** – Phone calls were not returned, and staff were not available at the time of the visits.

4. **Terra Logo Golf Club** This golf course is not interested in using recycled water because of the cost of this water and because nitrate levels would cause algae blooms in ponds and lakes. Due to a lack of interest, golf course staff did not meet with our team.
5. **Indian Palms Country Club** – A site visit was made, but staff could not be reached at that time. A subsequent brief telephone conversation with the golf course superintendent revealed that the preferred method of delivery to the golf course would be into the two lakes on the golf course.
6. **Indian Springs Country Club** – This golf course currently uses well water exclusively. However, an agreement with the CVWD has been made that when the CVWD adds a pipeline to service a nearby school, the golf course would begin taking canal water. The water usage for this golf course is lower than for other golf courses because of careful monitoring and tight management, and because exclusive use of well water eliminates the need for leaching to reduce salinity levels. Although most of the golf course is inside the City of Indio boundaries, a portion of the golf course is outside the City. The preferred connection location would be into the two golf course lakes.
7. **Plantation Golf Club** – In 2009, this golf course plans to use 90 percent canal water, and in recent years the percentage of canal water usage has varied between 35 and 40 percent. Canal water deliveries are reported to be difficult to manage because the water ordered does not correspond well to the water delivered. There is no automatic monitoring system to deliver water like the Heritage Palms golf course. Canal water deliveries are based on a “take or pay” agreement, which sometimes leads to inefficiencies in golf course irrigation practices. Well water is used when canal water deliveries are not adequate, and for overseeding. Recycled water delivery to the golf course ponds is preferred. This golf course expects recycled water usage to be mandated in the future.
8. **Shadow Hills Golf Course (Sun City)** – This golf course already uses recycled water from the CVWD water reclamation plant located north of the golf course, so a visit was not made to this potential customer since calls were not returned.
9. **Bermuda Dunes Golf Course** – This golf course is not in Indio, but is located near two other Indio golf courses. The golf course has interest in discussions to investigate using recycled water. There are no ponds that could be used to store recycled water deliveries. Currently the golf course uses well water only.
10. **Eagle Falls Golf Course** – This golf course is owned and run by an Indian community. Calls for information were not returned, and staff were not available at the time of the visit.
11. **City of Indio Parks** – Information on water use at the parks was not available. Estimates have been made for the water use. Some of the parks are small, so recycled water irrigation may only be feasible at the larger parks located near the recycled water transmission system.

12. **Empire and El Dorado Polo Clubs** – Staff were not available at the time of a site visit, and phone calls have not been returned. At the time of the visit, one large field was being irrigated with several very large sprinklers. Another field was set up to be irrigated using solid set sprinkler pipes. The polo clubs would need a large flow for these sprinklers, and irrigation also appears to take place during the day, which is different from the golf course nighttime irrigation schedules.
13. **HOA Sites** – Several HOA sites appear to have significant irrigated areas, but these sites were not visited.

4.2 Items to Consider in a Recycled Water Program, Based on Customer Interviews

The following is a list of items that were discussed in the interviews with golf course superintendants. These items are issues that will probably need to be considered and addressed in some way or another when implementing the recycled water program.

1. The City of Indio golf course may be a viable first candidate for recycled water use. If injection wells are selected to be a part of the recycled water program, then the wells would be constructed just east of the golf course in Posse Park.
2. The City may choose to establish a policy of recycled water usage in portions of the City where the infrastructure that delivers the recycled water could be constructed at a lower cost. Recycled water supplies may not be adequate to serve all potential customers.
3. Some golf course customers would be satisfied with a low pressure system that delivers water to ponds or lakes, while other customers would prefer water delivered at 90 – 95 psi to avoid re-pumping. The City would need to decide which approach to use.
4. The recycled water delivery system could potentially be divided into two different zones to deliver water at different hydraulic gradelines. The line going north under Interstate 10 could operate at a different gradeline than a line going south and west to serve other customers at a lower elevation.
5. If recycled water needs to be delivered in purple pipes to satisfy legal requirements that recycled water systems be distinguished from potable systems, then the City may need to adopt a policy regarding distinguishing the use of recycled water in sprinkler systems in golf courses and parks that are already constructed (i.e., signage, etc.).
6. Golf courses typically irrigate between the hours of 7:00 pm and 6:00 am, so storage needs to be provided to balance the difference between recycled water availability and irrigation demands or supplement with other water.
7. Seasonal variations in demand and recycled water delivery would require some form of aquifer storage and recovery to maximize recycled water use.
8. Interest was expressed in receiving recycled water mixed with canal water, using the same conduits that canal water is currently received.
9. The City would need to establish and implement a set of irrigation times throughout a week for each customer.

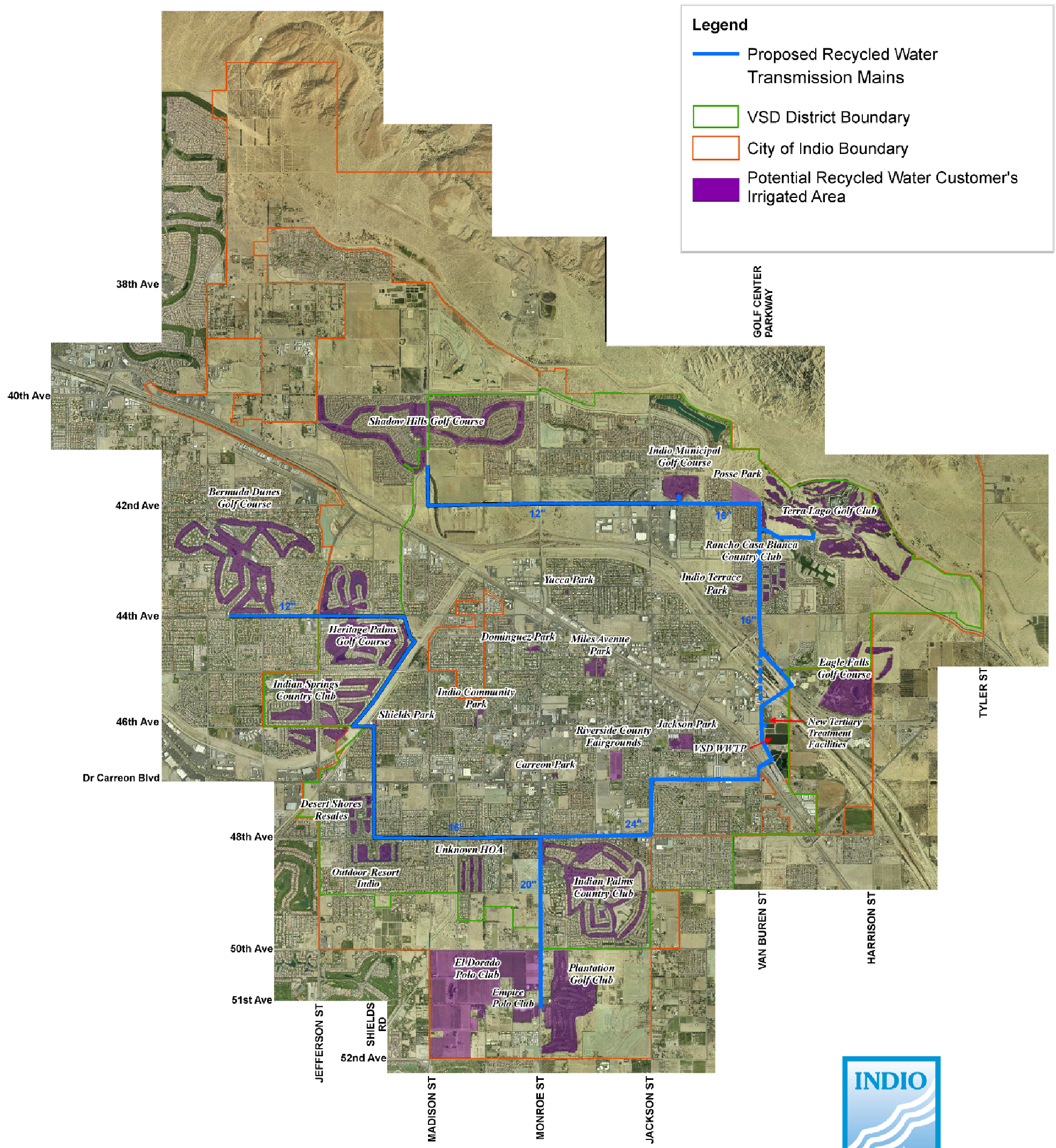
10. Recycled water nitrate and phosphorous levels can cause undesirable algae blooms in golf course ponds and lakes using current treatment at VSD. The City will probably need to address this issue to make recycled water more appealing to golf course owners.
11. Golf courses can obtain well water for a cost of $17 per acre-ft. plus the cost of pumping, and canal water can be obtained for a price of $30 per acre-ft. plus pumping costs. Golf courses are not likely to use recycled water exclusively. They will instead add recycled water to the mix of well and canal water that is already being used. The City will need to establish policies and strategies that encourage the desired amount of recycled water use, at an appropriate cost. If the primary objective of the recycled water system is to reduce groundwater pumping, then this objective is not achieved merely by replacing surface water with recycled water.
12. If the legal framework was in place to recharge recycled water then pump an equivalent amount of water from the golf course wells, then the infrastructure and management costs of the recycled water system would be significantly reduced.

5.0 CONCEPTUAL RECYCLED WATER DELIVERY SYSTEM

Figure 2 shows a map of the VSD and IWA boundaries, potential recycled water customer locations, and a conceptual pipeline route. To minimize infrastructure and pumping costs, the IWA may choose to deliver water at a pressure that is sufficient only to supply golf course ponds. The golf courses would then pump from the ponds to pressurize their irrigation systems. Recycled water pipelines would then be sized to deliver up to the maximum daily flow rate and not the peak flow rate from the irrigation pumps. Smaller recycled water users such as HOAs and City parks may need to provide booster pumping facilities to pressurize their irrigation systems to use recycled water. A phased program would add these smaller users as the recycled water transmission mains are extended to larger users.

The first portion of the recycled water delivery system would be to construct a pipeline from the VSD WWTP north across Interstate 10 to the Posse Park and Indio Municipal Golf Course. It may be easier to establish service to the City golf course and establish policies first based on experience with this customer. If the IWA chose to construct injection wells in Posse Park, then the pipeline infrastructure would be in place for these wells. Other customers that would utilize this pipeline could then be persuaded to connect to the recycled water system. A 16-inch line would provide up to 4.9 mgd and would be sufficient to supply all of the prospective customers north and east of Interstate 10. It is assumed that well injection in low irrigation demand periods.

The second portion of the water delivery system would be to run a line south and west of the VSD WWTP to serve the Indian Palms Country Club, Plantation Golf Club, and the Polo Clubs. This line may also be used to serve several of the City's parks. If the maximum daily flow rate will actually occur based on projected flows, then this pipe segment should be 24-inches in diameter. The polo clubs will require a higher flow rate than any of the golf courses, so a decision about requiring these clubs to use recycled water should be made before this pipeline is sized.



POTENTIAL RECYCLED WATER CUSTOMERS AND WATER DELIVERY INFRASTRUCTURE

Figure 2

December 2009

carollo

The third portion of the water delivery system would be a line from the intersection of Monroe Street and 48th Avenue to the Heritage Palms Golf Course and Indian Springs Country Club. This line could also serve HOAs and parks in the area. This pipeline would be 16-inches in diameter. If the Bermuda Dunes Golf Course (located outside the City limits) is served, then the pipeline would be 20-inches in diameter.

The Shadow Hills and Bermuda Dunes Golf Courses would be a lower priority for recycled water service. The Shadow Hills Golf Course is already using recycled water, and the Bermuda Dunes Golf Course is outside of the City boundaries. However, if the IWA had sufficient recycled water available that could not be used by other potential customers, then 12-inch pipelines could be constructed to deliver water to these customers as shown on Figure 2.

6.0 REFERENCES

Black & Veatch, 2008, *IWA Water Resources Development Plan Phase 2 Final Report*. Prepared for Indio Water Authority. August 2008.

Lee & Ro, Inc., 2006, *Valley Sanitary District Wastewater Treatment Plant Master Plan*. Prepared for Valley Sanitary District. October 2006.

NOISE IMPACT ANALYSIS

IWA

TOWN OF INDIO, CALIFORNIA

Prepared for:
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Date:

February 10, 2010

Project No.: P11-003N

PROJECT DESCRIPTION

The proposed project would treat wastewater flows to irrigation quality for use at golf courses, parks and other consumptive use. Such upgraded treatment would occur at the Valley Sanitation District (VSD) treatment plant. A distribution system would be installed over an extended period of time. The system would ultimately include 22 miles of pipeline and any necessary booster stations or reservoirs. Additionally, the project includes a proposed satellite treatment plant to further treat the irrigation quality water to advanced treatment standards. This higher quality water would be suitable for groundwater recharge and subsequent retrieval though aquifer storage recovery (ARS) wells.

The satellite treatment plant may be located at several locations. For purposes of analysis, the west side of Posse Park near an existing residential community has been selected as a possible worst-case situation for noise impacts. Treatment options (microfiltration, reverse osmosis, ultra-violet advanced oxidation, etc.) have not been finalized for either the irrigation quality or groundwater recharge quality water. However, it has been assumed that all treatment processes would occur within robust structures to insure adequate noise control.

NOISE SETTING

BACKGROUND

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is characterized by various parameters that describe the physical properties of sound waves. These properties include the rate of oscillation (frequency), the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The unit of sound pressure ratioed to the faintest sound detectable to a person with normal hearing is called a decibel (dB). Sound or noise can vary in intensity by over one million times within the range of human hearing. A logarithmic loudness scale similar to the Richter Scale for earthquake magnitude is therefore used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all sound frequencies within the entire spectrum. Noise levels at maximum human sensitivity from around 500 to 2,000 cycles per second are factored more heavily into sound descriptions in a process called "A-weighting," written as "dBA."

Leq is a time-averaged sound level; a single-number value that expresses the time-varying sound level for the specified period as though it were a constant sound level with the same total sound energy as the time-varying level. Its unit is the decibel (dB). The most common averaging period for Leq is hourly.

Because community receptors are more sensitive to unwanted noise intrusion during more sensitive evening and nighttime hours, state law requires that an artificial dBA increment be added to quiet time noise levels for noise/land use compatibility planning. The 24-hour noise descriptor with a specified evening and nocturnal penalty is called the Community Noise Equivalent Level (CNEL). CNEL is the average of Leq levels over a twenty-four hour period with a weighting factor applied to noises occurring during evening hours from 7:00 p.m. to 10:00 p.m. (relaxation hours) and at night from 10:00 p.m. to 7:00 a.m. (sleeping hours) of 5 dBA and 10 dBA, respectively. A similar noise metric called Ldn is almost equivalent to CNEL except for the application of the 5 dBA evening hour weighting.

NOISE ORDINANCE STANDARDS

CNEL-based standards are set forth in the Noise Element of the City of Indio General Plan. They are designed to insure that noise-sensitive uses are adequately shielded from sources that are pre-empted from local control. The noise constraints articulated in the General Plan relate to the proximity of noise-sensitive residential uses adjacent to the project boundary. When residential uses are located in close proximity to commercial or industrial activities, the General Plan Noise Element Implementation Measures include the following requirements:

Measure 2 - Sound attenuation features such as walls, berming and heavy landscaping shall separate residential uses from commercial or industrial uses to reduce noise and vibration.

Measure 3 - A noise study shall be prepared if a noise generator has the potential to impact existing sensitive land uses. The study shall be prepared during the environmental review process when mitigation can be developed to lessen impacts.

Measure 4 - When attenuation requirements cannot be met with walls, alternatives such as open space, earthen berms or project re-design shall be adopted.

Measure 7 - Construction activities shall be limited to hours allowed by ordinance.

Measure 8 - Construction staging areas shall be located as far as practical from residential areas.

The Community Development and Public Services Departments are identified as the responsible agencies for insuring enforcement of these implementation measures.

General Plan measures are generally considered as goals. More specific compliance criteria are generally contained in the Municipal Code. However, the City of Indio Municipal Code does not have specific property line numerical noise performance standards. In this absence, the standards set forth in Policy NOI-1.3 of the General Plan Noise Element are typically applied. Policy NOI-1.3 states that exterior noise levels for residences are not to exceed 65 dBA CNEL, and interior levels are not to exceed 45 dBA CNEL.

Experience shows, however, that exterior noise levels of 65 dB CNEL can be intrusive for quiet enjoyment of one's property (conversation, reading, napping, etc.). Any project elements capable of generating chronic noise should therefore strive to establish a substantial margin of safety relative to the 65 dB CNEL upper noise limit.

BASELINE NOISE LEVELS

Because the noise compliance threshold depends upon the acoustic baseline condition, an on-site noise measurement was made on February 7th through February 8th , 2011 for 24 hours, at three area locations. Two of the locations were selected to capture the baseline noise levels at the sensitive uses adjacent to the proposed satellite treatment plant at Posse Park on Avenue 42. The other meter was placed on the Valley Sanitary District (VSD) grounds where much of the advanced treatment equipment is to be sited. The 24-hour CNEL and hourly Leqs were recorded at these locations. The measured noise levels are shown in Table 1 and a map showing the meter locations is provided in Figures 1.

The data in Table 1 are expressed as energy-weighted averages (Leq). The CNEL comprises a weighted average of the hourly Leqs with nocturnal values penalized for being a more noise sensitive time period. The meters along Ave 42 demonstrate a CNEL of 64 dB closest to Avenue 42 and 56 dB farther from the roadway. These levels are compatible with the City of Indio residential noise standards. The meter at VSD recorded a CNEL of almost 65 dB. There are no sensitive uses in proximity to the district grounds.

Table 1
Existing Hourly Leq and CNEL (dB)

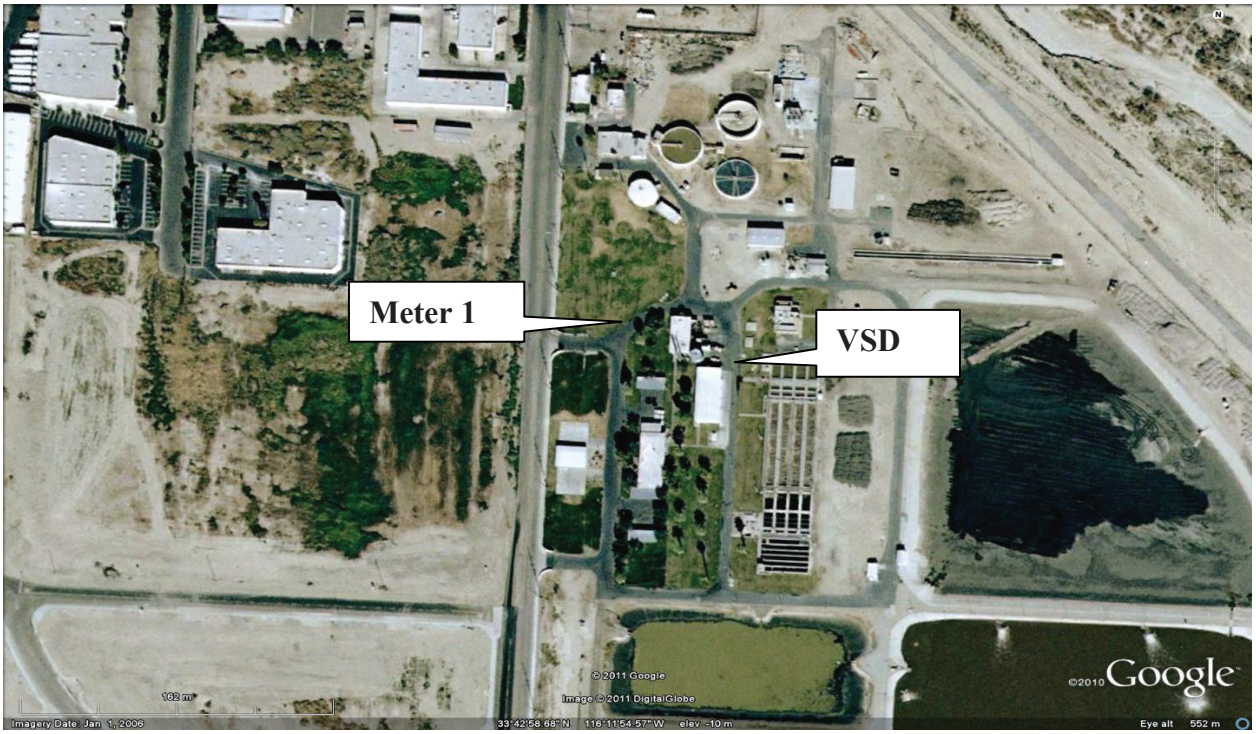
	Meter 1	Meter 2	Meter 3
15:00-16:00	53.4	61.2	51.1
16:00-17:00	55.6	61.4	52.7
17:00-18:00	54.8	61.2	51.1
18:00-19:00	57.5	60.6	53.1
19:00-20:00	57.1	58.8	47.8
20:00-21:00	59.5	58.5	49.7
21:00-22:00	58.0	56.9	46.7
22:00-23:00	56.3	59.4	49.3
23:00-24:00	56.0	56.3	47.9
0:00-1:00	57.5	56.1	48.8
1:00-2:00	57.5	56.5	47.0
2:00-3:00	58.7	50.2	43.0
3:00-4:00	59.5	48.6	41.7
4:00-5:00	59.7	54.8	44.9
5:00:6:00	56.2	56.6	52.3
6:00-7:00	60.3	57.9	54.1
7:00-8:00	59.6	67.9	55.2
8:00-9:00	57.5	59.9	49.5
9:00-10:00	57.3	58.7	43.8
10:00-11:00	56.3	58.9	46.1
11:00-12:00	56.4	60.2	46.0
12:00-13:00	57.1	58.7	45.5
13:00-14:00	60.2	58.3	43.7
14:00-15:00	57.8	58.3	47.5
CNEL	64.8	64.0	56.0

Meter 1: Valley Sanitary District headquarters, grass entry area, proposed location for new water tanks.

Meter 2: Proposed Posse Park satellite treatment plant, on site, west side near existing homes, 90 feet to Ave 42 centerline.

Meter 3: Proposed Ave 42 treatment plant, onsite- east side away from road near existing canal.

Figure 1 Noise Meter Locations



PROJECT NOISE IMPACTS

THRESHOLDS OF SIGNIFICANCE

According to the current CEQA Appendix G guidelines, noise impacts are considered potentially significant if they cause:

a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Noise levels exceeding the City of Indio Noise Standards would be considered significant.

b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Two characteristic noise sources are typically identified with a project such as the proposed waste water reclamation operations and support facilities. Construction activities, especially heavy equipment, will create short-term noise increases near each project site. Upon completion, project-related operational noise may impact the closest sensitive receptors at any water treatment or transmission facilities.

Construction noise is governed by ordinance limits on allowable times of equipment operations. Construction noise is typically governed by ordinance limits on allowable times of equipment operations. The City of Indio Municipal Code restricts construction to hours of least noise sensitivity when operations occur within 1,000 feet of a residence. These permitted hours are:

(1) *Pacific Standard Time.*

(a) Monday through Friday, 7:00 a.m. through 6:00 p.m.

(b) Saturday, 8:00 a.m. through 6:00 p.m.

(c) Sunday, 9:00 a.m. through 5:00 p.m.

(d) Government Holidays, 9:00 a.m. through 5:00 p.m.

(2) *Pacific Daylight Time.*

(a) Monday through Friday, 6:00 a.m. through 6:00 p.m.

(b) Saturday, 7:00 a.m. through 6:00 p.m.

(c) Sunday, 9:00 a.m. through 5:00 p.m.

(d) Government Holidays, 9:00 a.m. through 5:00 p.m.

(Ord. 1267, passed 4-5-00; Am. Ord. 1477, passed 9-20-06)

The General Plan Noise Element exterior noise standard for residential uses is 65 dB CNEL. Such levels are experienced near busy roadways and are potentially intrusive in a quiet suburban environment. Desirable interior noise levels in a residence are around 35 dB. Attenuation with partially open windows is around 10 dB. An exterior noise level of 45 dB would not intrude into outdoor enjoyment or indoor comfort. Achieving a 45 dB noise level at any affected residential use would meet the General Plan CNEL-based standard with a substantial margin of safety. A 45 dB hourly average exterior noise exposure is the recommended threshold of significance for the proposed project.

CONSTRUCTION NOISE IMPACTS

Temporary construction noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. Short-term construction noise impacts tend to occur in discrete phases dominated initially by earth-moving sources and then construction housing and equipment installation. Figure 2 shows the typical range of construction activity noise generation as a function of equipment used in various building phases.

For this project, the construction activity that is expected to most impact sensitive use is construction of the proposed pump stations along Avenue 42. This location has residential uses immediately adjacent to the west. Pump station installation requires very little earth movement with an anticipated 5 days of grading. However, construction is anticipated to occur over a three month span.

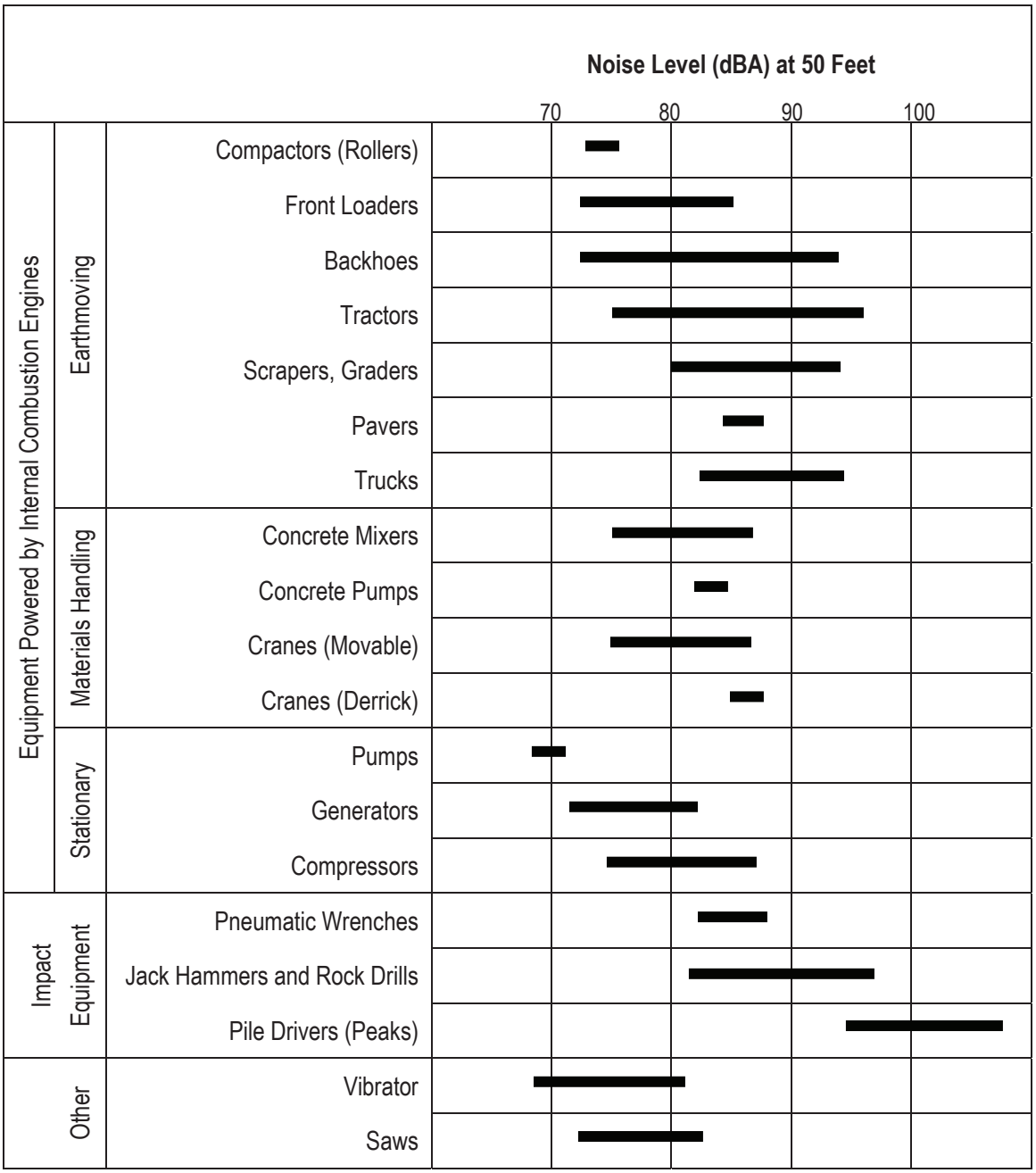
Measurements have shown that the noise emission levels in Figure 2 tend to be more associated with periodic events under full load rather than chronic (hourly or longer) noise exposure. Short term noise generation tends to be on the higher end of the ranges, while longer term exposure is at the quieter end of the noise spectrum. Spherically radiating point sources of noise emissions are atmospherically attenuated by a factor of 6 dB per doubling of distance. The loudest earth-moving noise sources will therefore be temporarily detectable above the local background beyond 1,000 feet from any individual construction area. An extensive noise impact envelope requires a clear line of sight from source to receiver. The homes immediately west of the proposed pump stations will be within the 1,000 foot radius, but are partially shielded from the proposed pump station location by a 6-foot sound wall.

Construction activities are restricted to hours of lesser noise sensitivity by Section 95C.08 of the City of Indio Municipal Code if they entail the operation of mechanized tool or machinery within 1000 feet of any occupied residence. The hours are generally from 7 a.m. to 6 p.m. during the winter, and 6 a.m. to 6 p.m. during daylight savings time.

Pipeline projects for the distribution system are progressive and noise is generated at any one location for only a brief time. Most proposed pipelines would be installed within roadways where traffic noise would help to mask temporary construction noise. Because of residential proximity to the proposed satellite treatment plant, adherence to the recommended hours is required. Construction activities occurring within the VSD grounds would not have any adjacent sensitive receptors and do not require adherence to the time restrictions.

Figure 2

Typical Construction Equipment Noise Generation Levels



Source: EPA PB 206717, Environmental Protection Agency, December 31, 1971, "Noise from Construction Equipment and Operations."

CONSTRUCTION ACTIVITY VIBRATION

Construction activities generate ground-borne vibration when heavy equipment travels over unpaved surfaces or when it is engaged in soil movement. The effects of ground-borne vibration include discernable movement of building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. Within the "soft" sedimentary surfaces of much of Southern California, ground vibration is quickly damped out. Because vibration is typically not an issue, very few jurisdictions have adopted vibration significance thresholds. Vibration thresholds have been adopted for major public works construction projects, but these relate mostly to structural protection (cracking foundations or stucco) rather than to human annoyance.

Vibration is most commonly expressed in terms of the root mean square (RMS) velocity of a vibrating object. RMS velocities are expressed in units of vibration decibels. The range of vibration decibels (VdB) is as follows:

65 VdB	-	threshold of human perception
72 VdB	-	annoyance due to frequent events
75 VdB	-	annoyance due to occasional noise
80 VdB	-	annoyance due to infrequent events
100 VdB	-	minor cosmetic damage

To determine potential impacts of the project's construction activities, estimates of vibration levels induced by the construction equipment at various distances are presented below:

	Approximate Vibration Levels (VdB)*		
Equipment	**25 feet**	**50 feet**	**100 feet**
Large Bulldozer	87	81	75
Loaded Truck	86	80	74
Jackhammer	79	73	67
Small Bulldozer	58	52	46

* (FTA Transit Noise & Vibration Assessment, Chapter 12, Construction, 1995)

The majority of treatment plant construction activities will take place within the Valley Sanitary District grounds where there are no adjacent sensitive uses. Pipeline installation will not require equipment larger than a small bulldozer. Groundwater recharge construction could require a large bulldozer during grading. The closest home is approximately 50 feet from the closest proposed treatment facility. The stated vibration source level in the FTA Handbook for such equipment is 81 VdB at 50 feet from the source such that the annoyance threshold could be temporarily exceeded at the closest residential property line. With carpeting and other floor treatments, vibration would be barely perceptible indoors at the closest homes. Regardless, vibration levels will not exceed the building damage threshold. Construction activity vibration impacts are judged as less-than-significant.

OPERATIONAL NOISE IMPACTS

The proposed project includes the following components:

(1) Installation and operation of a tertiary treatment system that complies with Title 22 Standards for recycled irrigation water

(2) Installation and/or conversion and operation of approximately 22 linear-miles pipelines for recycled water conveyance,

(3) Installation and operation of one or more groundwater recharge treatment facilities, and

(4) Installation and operation of aquifer storage recovery (ASR) wells or conversion and operation of existing wells to ASR for groundwater recharge. The project components would be expected to be implemented in phases based upon recycled water availability and market demand.

(5) Install booster pumping facilities to pressurize their irrigation systems in order to use recycled water for HOAs and City parks

With the exception of the pipelines and booster pumping stations, proposed improvements are adjacent to existing operations. The nearest homes are a minimum of 2,000 feet from the VSD grounds and are separated by the heavily traveled highway 111 roadway. Distance separation as well as background traffic noise along route 111 will mask any possible project noise from the Valley Sanitary District site. As shown earlier, the CNEL on the District site grounds is currently less than 65 dB.

Pipelines are not perceived as significant noise generators in that there are no noise sources associated with fluid flowing in an underground pipeline. A large number of aqueducts have been installed in southern California with negligible operational noise impacts. Potential project noise impacts from pipeline projects therefore derive almost exclusively from construction activities.

Due to the nature of their purpose, to forcefully convey water through a treatment system, water treatment plans are noise generators from pump operation. The water pumps are usually ensconced in concrete-block buildings. Internally, sound absorbing materials are used to help prevent workers from hearing damage. Interior noise control also helps with sound leakage to the outside.

Interior noise levels in pump stations with large capacity pumps with minimal interior absorption are typically in the 76-82 dB range (Archibald and Ontario Pump Stations, 06/14/2010). Such measurements are assumed to be representative of the worst-case treatment facility noise at the proposed groundwater recharge facility. It would require a combination of interior sound absorption and solid walls to render the treatment process noise essentially in audible at the closest homes. The presence of an existing solid block subdivision wall would further reduce noise levels. Measurements at a reverse osmosis and UV disinfection wastewater treatment facility observed noise reductions of 40-45 dB from solid walls and steel doors. If louvers are required for air circulation, the noise reduction may only be 30 dB on any building façade with louvers or other non-solid components (doors, windows, etc.)

For an assumed internal treatment activity, noise levels of 82 dB with a solid (CMU, brick, slump stone, etc.) wall facing the closest homes, property line noise levels will be 37-42 dB. Attenuation from the property line perimeter wall and additional distance spreading losses will reduce the residential façade noise exposure to less than 35 dB. Such levels would be generally imperceptible within the existing ambient noise environment.

If the satellite treatment plant lay-out precludes creating a completely solid wall facing the closest homes, noise levels at the property line from water treatment activities could be audible. Levels could exceed the 45 dB significance threshold. Mitigation measures to achieve a sub-45 dB exposure are as follows:

- Increase interior sound absorption with acoustical paneling to reduce the noise source strgenth, and/or,

- "Flip" the plant-layout to place the break tanks and water storage tanks closest to the property line to increase the distance from the two planned pump stations (brine and finished water) and treatment process to the property line.

Within these mitigation options, noise impacts at the rear of the closest residences can be reduced to less-than-significant.

SUMMARY

CONSTRUCTION

Construction activities are restricted to hours of lesser noise sensitivity by Section 95C.08 of the City of Indio Municipal Code if they entail the operation of mechanized tool or machinery within 1000 feet of any occupied residence. The hours are:.

(1) *Pacific Standard Time.*

(a) Monday through Friday, 7:00 a.m. through 6:00 p.m.

(b) Saturday, 8:00 a.m. through 6:00 p.m.

(c) Sunday, 9:00 a.m. through 5:00 p.m.

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(d) Government Holidays, 9:00 a.m. through 5:00 p.m.

(Ord. 1267, passed 4-5-00; Am. Ord. 1477, passed 9-20-06)

Vibration associated with construction of the proposed satellite treatment plant may be perceptible at the nearest off-site sensitive receptors during the short-term grading operations, but will not be above any damage thresholds.

OPERATION

There are no sensitive receptors in proximity to the Valley Sanitary District grounds. No operational noise is anticipated at the nearest off-site sensitive receptors across Highway 111 for operations occurring within the VSD site.

Pipelines are not perceived as significant noise generators in that there are few noise sources associated with fluid flowing in an underground pipeline.

Pump stations and treatment facilities operating at the proposed site at Posse Park are not expected to exceed residential noise thresholds at the adjacent homes to the west as long as operations are shielded by solid robust walls. If there are any breaks in the walls facing the nearest homes, mitigation to reduce interior noise reverberation with acoustical panels and/or creating a mirror image site lay-out for an increased source-receiver distance would be necessary.