ATTACHMENT 5: WORK PLAN

The following work plan is consistent with and supports the budget and schedule for the project. The level of detail is sufficient to function as the scope of work and allows reviewers to understand the level of effort of work being performed.

Describe in sufficient detail what will be done and what the product will be

The District's ***Water Recharge Monitoring Well Project*** is for the design and construction of an approximately 1,000-foot deep monitoring well with 3-5 piezometers and other instrumentation (See Figure 1). The monitoring well is needed to: 1) track the movement of recharge water within the Joshua Tree groundwater basin to optimize pumping and ameliorate overdraft conditions; 2) monitor groundwater recharge impact on nitrate concentrations; and 3) expand the region's overall understanding of water recharge and movement for optimized groundwater management. The ***Water Recharge Monitoring Well Project*** directly synergizes the District's Water Recharge Facility Project and is recommended by the USGS. The basic concern is the rising water levels resulting from AR entraining nitrates (anthropogenic occurrence from septic tank effluent) stored in the unsaturated zone. The source of the nitrates is septic-tank effluent. The USGS has already installed an unsaturated-zone monitoring site at the proposed recharge site. The ***Water Recharge Monitoring Well Project*** will allow USGS and the District to monitor the flow of water to the water table and to monitor any water-quality changes. In addition to UZ instrumentation USGS installed one well at the water table which will allow then to monitor water levels and water quality on site.

The ***Water Recharge Monitoring Well*** will be located down-gradient from the water recharge site and will be approximately 1,000-feet deep with a minimum of three and up to five piezometers with pressure transducers installed in each. In addition to depth-dependent water levels, depth-dependent water-quality data will also be collected. The idea is that the monitoring well will be an early warning system to help prevent a high-nitrate event from occurring in Joshua Tree Groundwater Basin. The transducers record water-level data at 1-4 hour intervals and these data are downloaded every 6-8 weeks. USGA will also collect water-quality data (stable isotopes, nutrients, DOC, major and minor ions) from each piezometer. Prior to recharge starts which will occur upon completion of the Water Recharge Facility project, USGA will collect data 2-3 times and once the recharge begins, USGS will collect data quarterly. The water-level and water-quality data from the new site will be in addition to data collected from the existing well at the recharge site (JTUZ-4). The location of the monitoring well will provide the District and USGS with the best opportunity to monitor movement of the recharged water within the groundwater basin and verify the timing of recharged water to the target production aquifers. Although the benefits of the monitoring well have not been monetized, they are important to the region's understanding of water recharge and movement and its impact on nitrate concentrations.

Background

Joshua Basin Water District (District) was formed as a public agency in 1963, when the District purchased and combined several smaller existing water systems. Since that time, JBWD has grown to serve more than 5,500 connections within its 96-square mile service area, between Yucca Valley,

Twentynine Palms, Joshua Tree National Park and the Twentynine Palms Marine Corps Base. Situated above the Copper Mountain and Joshua Tree groundwater basins in the Morongo area, the District's sole source of water is groundwater pumped from these two basins.

The District is responsible for overall management of local groundwater resources pursuant to the Joshua Basin Water District AB3030 Groundwater Management Plan, and has the authority to initiate regional water supply and groundwater recharge projects. The District is currently bidding construction of a Water Recharge Facility Project (see attached report), consisting of a 16-inch water delivery pipeline and 30-acre recharge basin site. Supply water to the project is allotted State Water Project (SWP) water, and will relieve current overdraft conditions in the Joshua Tree groundwater basin.

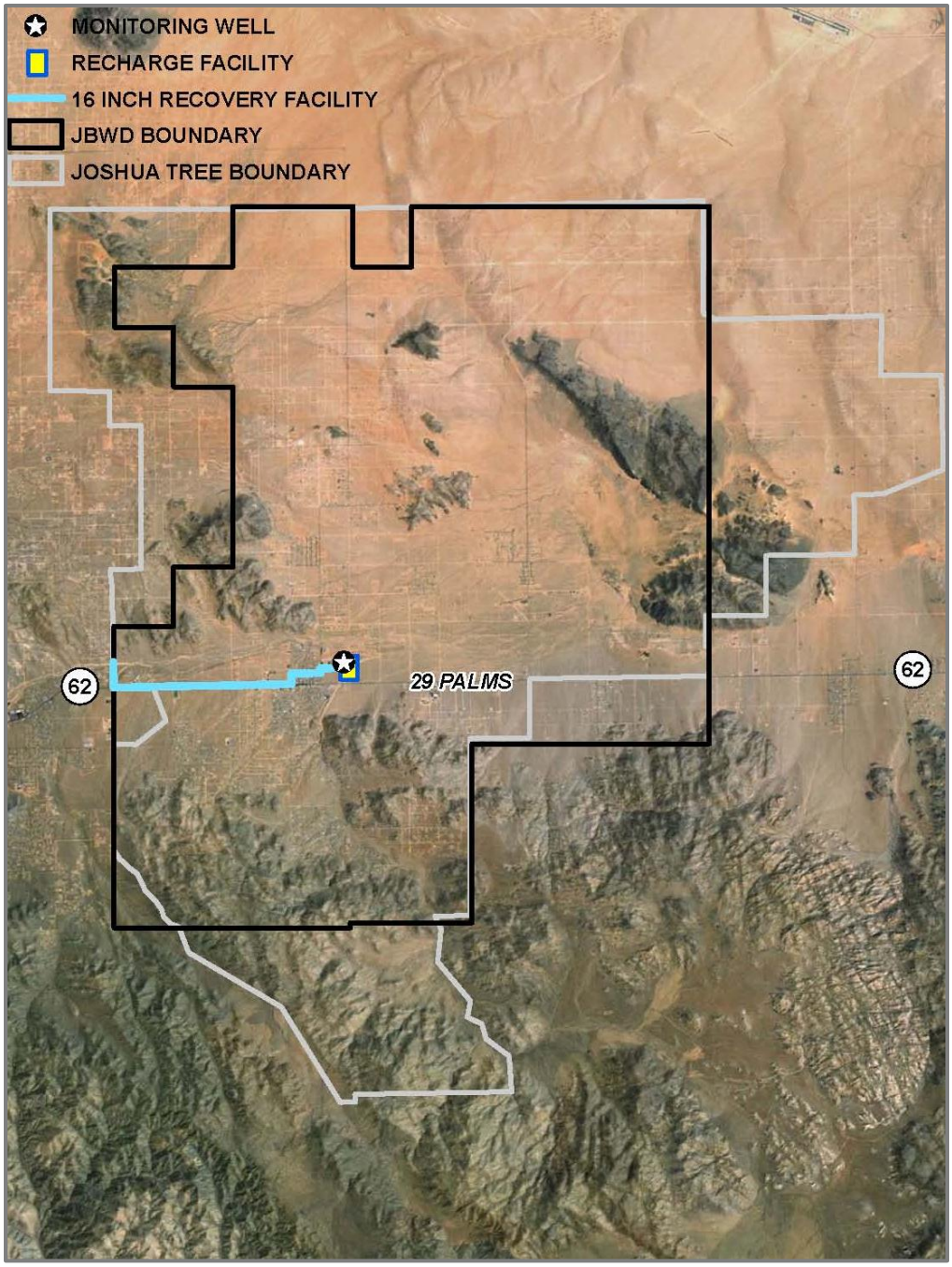
JBWD is entitled to receive SWP water through cost participation with the Mojave Water Agency (MWA) Morongo Basin Pipeline Project. MWA is a SWP contractor that serves an area of 4,900 square miles of the high desert region of Southern California. In January 1995, the MWA completed construction of a 71-mile pipeline to deliver SWP water to the communities served by the Hi-Desert Water District, Bighorn-Desert View Water Agency, San Bernardino County Service Area 70, and Joshua Basin Water District. This construction project included an agreement which entitled the District to an annual volume of 1,959 afy of SWP water until 2022. Negotiations are underway to extend the date and quantity of that allocation.

In addition to the groundwater replenishment benefit, groundwater replenishment is also being pursued to address nitrate contamination of the District's groundwater supplies. Currently, the groundwater basins receive little or no natural recharge. The primary source of basin recharge is through septic tank discharges. Currently, all parcels within the District are served by on-site septic facilities. The District has monitored the nitrate conditions within the basins for many years. Current studies project critical contamination levels within the next 40 to 50 years. Groundwater modeling studies have identified that the proposed recharge project will halt and reverse nitrate contamination within the District's only water supply.

The District contracted with the United States Geologic Survey (USGS) for evaluation of nitrate conditions and potential recharge sites prior to design of the project. USGS, as part of its contract, constructed two unsaturated zone wells on the proposed recharge site. The USGS has also identified the need to construct a deeper saturated zone monitoring well for the purpose of monitoring groundwater levels and for testing water quality (particularly nitrate concentration) impacts. Having invested significant resources into the development, design and pending construction of the project, the District is in need of additional funding to support the design and construction of this final monitoring well.

The current project cost is estimated at $250,000 for design and construction of the monitoring well by the USGS.

Figure 1. Vicinity Map



Specific purpose, goals, and objectives of the proposed project related to improving groundwater management and implementing the GWMP and/or where applicable the IRWM Plan;

The Joshua Tree and Copper Mountain Groundwater Basins are in a state of overdraft. In order to optimize and most effectively manage the resources of the basin, the Districts needs data and information on water migration and water quality in these basins-these are the goals of the project. The objectives of proposed and needed ***Water Recharge Monitoring Well*** are to: 1) track the movement of recharge water within the Joshua Tree groundwater basin to optimize pumping and ameliorate overdraft conditions; 2) monitor groundwater recharge impact on nitrate concentrations; and 3) expand the region's overall understanding of water recharge and movement for optimized groundwater management. Without the ability to collect data and utilize it to make better decisions for planning, strategy and groundwater management, the already imperiled basins may suffer severe and potentially irreversible consequences. Overdraft in a basin can cause wells to go dry, water quality to be degraded, land to subside, and riparian habitats to be affected.

It is fundamental objective of JBWD is to manage declining groundwater quality and quantity in its Copper Mountain and Joshua Tree groundwater basins. In accordance with the objectives adopted from 1996 JBWD Groundwater Management Plan (GWMP), JBWD is obligated to manage the local groundwater basins. The purpose of the GWMP is to enable JBWD to manage its groundwater quality and supply in a manner that avoids groundwater contamination or excessive overdraft, while simultaneously continuing to provide the present and future residents of its service area with a safe and reliable water supply.

Data and information gathered through the monitoring well has a direct impact on the ability JBWD has to meet effectively implement its GWMP. Effectual groundwater management is based on the most accurate and up to date information on the condition of the groundwater basins. The ***Water Recharge Monitoring Well*** provides a window into the elusive world or groundwater migration in the Joshua Tree and Copper Mountain Basins. With the implementation of the project, the USGS and the District will have a deeper understanding and more accurate picture of how and where the recharge water is moving, its impacts on nitrate condition and other water quality impacts and allow these entities to best strategize for a sustainable groundwater basin condition. The information will be readily absorbed and used to either adapt to a situation or generate more effective groundwater management strategies and potential projects.

The Joshua Basin Water District is a collaborative partner in the IRWM process and impacts to the Joshua Tree and Copper Mountain Basins have a direct impact on the planning and projects that emerge from the IRWM Region. The realization of the ***Water Recharge Monitoring Well*** would not only be a

success for the District, but is also instrumental in assisting the Region in attaining its overall groundwater management, water supply, water quality and water reliability goals. The data and information collected will be useful in informing the entire region about water migration in the area and can be used as a model for other sub-basins in the Region and adjacent regions. Lessons learned from the project will be communicated to the RWMG and its partners and project performance could be a metric to demonstrate Plan success as well as an asset to the IRWM Plan.

Work items to be performed under each task of the proposed tasks (consistent with the budget and schedule)

The work items to be performed in conjunction with the ***Water Recharge Monitoring Well*** are consistent with the budget and the schedule included as Attachments 6 and &, respectively. The work tasks include:

- Preparation of Design Documents, Plans and Specifications
- Preparation of a Notice and Open a Bid for the ***Water Recharge Monitoring Well***
- Award Bid and Provide Written Notice of Award
- Provide Written notification of Awarded Prime Construction Contractor and Not Initiation of Construction
- Complete Construction

Background Project Schedule

As discussed in Attachment 4, the overall Water Recharge Project is currently out to bid, with a bid opening date of July 25, 2012. Construction is scheduled to begin in mid-August 2012. The District anticipates that construction of the pipeline and recharge basins will take a minimum of eight months and a maximum of eleven months to construct. Construction completion is anticipated between April and June 2013. Water recharge deliveries are anticipated to commence immediately upon completion of construction. Thus, the required ***Water Recharge Monitoring Well*** is needed to be fully constructed by April 2013. Therefore, the District's goal is to acquire the funding for the monitoring well during the third quarter of 2012, with design, construction and testing of the well during the fourth quarter or 2012 or the first quarter of 2013. The proposed schedule allows the District to construct and test the monitoring well, as well as gather background data, prior to commencement of water recharge operations in the second quarter of 2013.

Present a sound strategy for evaluating progress and performance at each step of the proposed project

JBWD and its consultants, including the construction management team will adhere to a strict and focused project timeline which will include at least monthly meetings, if not bi-weekly meetings between construction staff and the construction management team. Meeting agendas and meeting notes will be generated and reviewed by the construction management staff as well as JBWD and USGS staff. These

agendas and meeting notes will comprise monthly project progress reports for JBWD and USGS review and approval. Monthly progress reports will include the progress to project completion, milestones and identify any potential changes in schedule, obstacles or deviations from plans and/or specifications. Any deviations and or changes would need to be sufficiently documented and explained and require approval of the JBWD and/or the USGS prior to execution. Overall project performance will be conveyed to DWR in quarterly progress reports throughout the duration of the project.

Project deliverables for assessing progress and accomplishments, which include quarterly progress and final reports.

Quarterly progress reports will provide the JBWD, USGS and DWR with another opportunity to document success, identify potential problems and find solutions and benchmark progress to project goals. Quarterly reports will be substantive, yet concise. Further, these reports may be used as metrics for the overall grant administration performance and will be helpful and necessary in compilation of the final project completion report.

The District will ensure that progress reports are prepared in sufficient detail, including a brief qualitative assessment of the activities, percentage of tasks accomplished, milestones, lessons learned (as necessary), and next steps for the overall task. Any substantive deviations from the original contract will be communicated to DWR in a timely manner and will be sufficiently explained in the progress reports.

If access to private property is needed, provide assurance that access can be granted.

No. Access to private property is not required.

Explain the plan for environmental compliance and permitting including a discussion of the following items: a description of the plan, proposed efforts, and approach to environmental compliance, including addressing any CEQA obligations in connection with the proposal; a listing of environmental related permits or entitlements that are needed for the project; and any other applicable permits that will be required. Briefly describe the process and schedule for securing each permit/approval. Discuss necessary local drilling permits and the submittal of Well Completion Reports to DWR. Describe the proposed process for securing each environmental permit and any other regulatory agency approval.

The project is categorically exempt under CEQA. Therefore, the District will prepare a Notice of Exemption, file it with the San Bernardino County Clerk of the Board and provide record to DWR.

The District has consulted with all appropriate agencies and no permits are required for the ***Water Recharge Monitoring Well*** project.

As necessary and appropriate as a part of the project, the District will complete the attached Well Completion Report (attached) to DWR's specifications.

SCOPE OF WORK

The District's ***Water Recharge Monitoring Well Project*** is for the design and construction of an approximately 1,000-foot deep monitoring well with 3-5 piezometers and other instrumentation.

GOALS AND OBJECTIVES

The Joshua Tree and Copper Mountain Groundwater Basins are in a state of overdraft. In order to optimize and most effectively manage the resources of the basin, the Districts needs data and information on water migration and water quality in these basins-these are the goals of the project. The objectives of proposed and needed ***Water Recharge Monitoring Well*** are to: 1) track the movement of recharge water within the Joshua Tree groundwater basin to optimize pumping and ameliorate overdraft conditions; 2) monitor groundwater recharge impact on nitrate concentrations; and 3) expand the region's overall understanding of water recharge and movement for optimized groundwater management. Without the ability to collect data and utilize it to make better decisions for planning, strategy and groundwater management, the already imperiled basins may suffer severe and potentially irreversible consequences. Overdraft in a basin can cause wells to go dry, water quality to be degraded, land to subside, and riparian habitats to be affected.

WORK ITEMS

Task 1.0 Prepare Design Documents, Plans and Specifications

The District will contract with a qualified engineering firm to design and draft the water recharge monitoring well. This well will be designed to the required specifications of the USGS and the USGS and JBWD will be consulted throughout the design process. The final products will be the design plans and detailed specifications.

Task 2.0 Prepare a Notice and Open a Bid for the *Water Recharge Monitoring Well*

Task 2.1 Once the final design plans and specifications have been finalized, the District will Notice and put the project out to bid.

Task 2.2 The District will review all eligible bids and make a determination, bring a recommendation to the Board of Directors and Award a Bid to the Contractor

Task 3.0 Award Bid and Provide Written Notice of Award

Task 3.1 Once the Board has moved to Award the contract, the District will provide a Notice of Award to the selected contractor

Task 4.0 Issue a Notice to Proceed

Task 4.1 Once all contractual matter have been satisfactorily executed, the District will issue a Notice to Proceed and initiate construction

Task 5.0 Project and Progress Tracking and Reporting Requirements

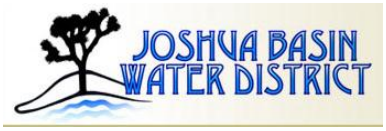
Task 5.1 The District will attend a kick-off meeting for the project and outline all the required project and progress tracking and reporting requirements, prior to commencement of construction. The selected contractor and construction management team will be briefed on grant reporting and invoicing requirements.

Task 5.2 Prepare and submit meeting agendas and minutes and monthly and quarterly progress reports. Provide to appropriate entities and to DWR.

Task 6.0 Complete Construction and Comply with Grant Completion Requirements

Task 6.1 Complete Construction on schedule, on budget and to the prepared plans and specifications

Task 6.2 Prepare the necessary and required project completion reports and submit to DWR



Local Groundwater Assistance Grant
Work Plan

Water Recharge Facility Project

JOSHUA BASIN WATER DISTRICT

FEASIBILITY STUDY

Water Recharge Facility Project

Prepared For:

Joshua Basin Water District

61750 Chollita Road
Joshua Tree, CA 92252

JOSHUA BASIN WATER DISTRICT

PO Box 675 • 61750 Chollita Road • Joshua Tree CA 92252
Phone (760) 366-8438 • Fax (760) 366-9528 • www.jbwd.com

Prepared by:

DUDEK

605 Third Street
Encinitas, CA 92024

AUGUST 2011

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1 INTRODUCTION

1.1 IDENTIFICATION OF PROJECT SPONSOR

Joshua Basin Water District (JBWD or District) is the project sponsor for the Recharge Basin Supply Pipeline Project. JBWD was formed as a public agency in 1963, when the District purchased and combined several smaller existing water systems. Since that time, JBWD has grown to serve more than 5,500 connections within its 96-square mile service area, between Yucca Valley, Twentynine Palms, Joshua Tree National Park and the Twentynine Palms Marine Corps Base.

Situated above the Copper Mountain and Joshua Tree groundwater basins in the Morongo area, the District's sole source of water is the groundwater that is pumped from these basins. These groundwater basins contain over 600,000 acre-feet (af) of water.

The Latitude/Longitude of the Joshua Basin Water District is centered on 34°07'37"N 116°19'07"W. The Section Township and Range is: Sections 1 through 4 and 9 through 16, Township 1 South, Range 6 East, Sections 1 and 2, 11 through 14, 22 through 28 and 33 through 36, Township 1 North, Range 6 East, Sections 23 and 24, 26 through 28 , and 34 through 36, Township 2 North, Range 6 East, Sections 5 through 8, and 17 and 18, Township 1 South, Range 7 East, Sections 1 through 36, Township 1 North, Range 7 East, and Sections 20 through 36, Township 2 North, Range 7 East, all of San Bernadino Meridian, in the County of San Bernadino, State of California.

JBWD is responsible for the overall management of the groundwater resources pursuant to the Joshua Basin Water District AB3030 Groundwater Management Plan. JBWD has the authority to initiate regional water supply and groundwater recharge projects to replenish its depleting groundwater. One of these projects is the construction of a **"Water Recharge Facility Project"**, consisting of a 16-inch water delivery pipeline and 30-acre recharge basin site. The water supply pipeline will provide JBWD access to its allotted State Water Project (SWP) water and will relieve current overdraft conditions in the Joshua Tree groundwater basin.

JBWD is entitled to receive SWP water through cost participation with the Mojave Water Agency (MWA) Morongo Basin Pipeline Project. MWA is a SWP contractor that serves an area of 4,900 square miles of the high desert region of Southern California. In January 1995, the MWA completed construction of a 71-mile pipeline to deliver SWP water to the communities served by the Hi-Desert Water District, Bighorn-Desert View Water Agency, San Bernardino County Service Area 70, and JBWD. This construction project included an agreement between JBWD and MWA, which entitled JBWD to an annual volume of 1,959 afy of SWP water until 2022 and provided a stub-out at JBWD boundary for future extension of the MWA pipeline.

JBWD cannot access its entitled amount of SWP water without the extension of the Morongo Pipeline and construction Water Recharge Facility Project to replenish its depleting ground water basin, thus creating a need for the construction of a 16-inch water delivery pipeline and 30-acre recharge basins.

1.2 DESCRIPTION OF STUDY AREA AND AREA PROJECT MAP

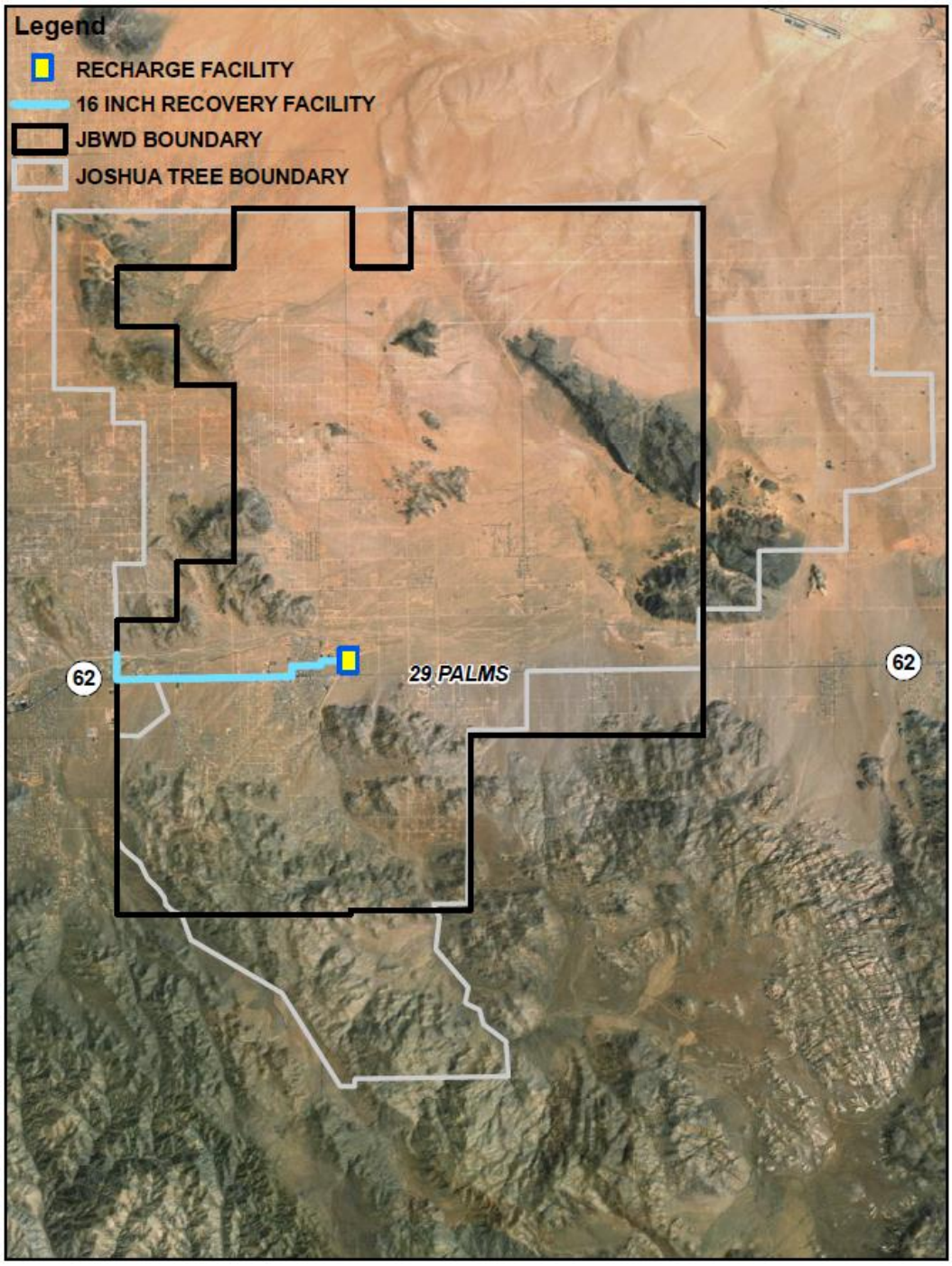
Lack of sufficient delivery, storage and recharge facilities and funding limitations are the primary factor restricting JBWD from receiving its entitled portion of SWP water. Water Recharge Facility Project have been initialed by JBWD to address these issues through the construction of a (1) 16-inch pipeline to take delivery of SWP water and (2) 30-acre recharge basins to replenish the groundwater basin, respectively.

This project will utilize the unused storage capacity in JBWD's Joshua Tree groundwater basin to enhance the regional supply and quality of water, by recharging with inflow from the SWP water supplied through MWA's Morongo Basin Pipeline. A portion of the stored recharge water will then be extracted by new wells for delivery at purveyor turnout locations. The Water Recharge Facility Project will provide the facilities necessary to increase JBWD's use of its allotment SWP water up to 1,959 acre-feet per year (AFY), increasing basin recharge, and managing basins extractions to mitigate the basin's overdraft condition. It will also improve water quality for its customers. The District's customers are the residents of Joshua Tree community.

1.3 Definition of Study Area

Figure 1-1 shows the geographic location of the proposed Water Recharge Facility Project. Once all facilities have been constructed, the project will allow for the storage of an average of 1,959 AFY of SWP water in the Joshua Tree groundwater basin, and allow for an annual extraction of up to 1,959 acre-feet that will be delivered to its customers throughout the region.

FIGURE 1-1 – REGIONAL VICINITY MAP



BENEFITS - Implementation of this project will benefit the District's groundwater basin by reducing the rate of overdraft, achieving a balance of water supply and consumptive use, and allowing greater opportunities for JBWD to safely and cost-effectively reclaim the local groundwater that originally have elevated contaminate levels of nitrate, thus reducing nitrate contamination.

Currently, the only source of groundwater recharge is though percolation from septic tanks that have high level of nitrates. Continuous percolation from septic tanks is like to build up nitrate levels in the

local groundwater. Recharging the groundwater with SWP water will potentially help in reducing the elevated nitrate levels and preventing further nitrate build-up in the groundwater.

Additionally identified project benefits include:

- Water supply enhancement. Importing an average of 2,000 acre-feet per year reduces existing conditions of overdraft and begins to refill the basin to pre-development levels. This benefit is not monetized, but is expected to be substantial. The alternative of long-term overdraft is not a viable solution for the community.

- Pump lift. Water users pump groundwater to serve their customers. Every foot of water table rise will avoid an energy payment of approximately $0.22 per acre-foot pumped per year. According to the USGS1, current pumping in the 12-square mile Joshua Tree subbasin is approximately 1,610 acre-feet per year and overdraft is 403 acre-feet per year. Septic return flows are estimated to be 73 percent of extractions and observed water table declines have averaged 1.5 to 2 feet per year. It appears that only a small fraction of the water returned to septic systems has made its way to the water table. Current overdraft is estimated to average between 270 and 430 acre-feet per year depending on the estimation of net natural recharge, which ranges from zero to 157 acre-feet per year. Using an average specific yield derived from the USGS study of 3.5 percent, a recharge of 2,000 acre-feet per year would raise water tables about 7.4 feet per year, or 370 feet over what they would have been after operating for the 75-year project life.

  Water extractions are expected to grow from 1,610 to about 2,090 over the next 25 years. Assuming this increase is continued, extractions would be about 3,030 at the end of the project life. Assuming pump efficiency of 70 percent and a 2009 energy cost of $0.15 per kWh, the benefit detailed in Table 2 is $0.22 per acre-foot per foot of lift per year.

- Water Quality. Importing SWP water into the basin maintains lower nitrate concentrations, and will defer the need for wastewater treatment for a period of years. This deferral would have significant economic benefits, but has not been monetized or estimated.

- Reliability. Eliminating overdraft and replenishing the groundwater system provides stored water for use during prolonged droughts or outages in the State Water Project supply system. This benefit is not monetized, but is expected to be substantial. The alternative of no storage reserve during drought periods would put additional pressure on the SWP supply during drought period and is not considered a viable solution for the community.

- Monitoring and Modeling. A cooperative study with the U.S. Geological Survey was performed these studies are a groundwater flow model that describes the movement of groundwater in the Joshua Tree basin, and the installation of a multi-completion monitoring well on the recharge pond site that will be used to verify the timing of recharged water to the target production aquifers. These benefits have not been monetized, but are important to the region's understating of water recharge and movement.

- Avoided Water Treatment Plant Cost. The Joshua Basin Water District service area has little natural recharge. Average rainfall within the Joshua Tree area is roughly five inches per year2. Inflows as much as 157 acre-feet per year via runoff from local washes has been estimated by USGS modelers3, but there is great uncertainty how much of this water reaches the water table. USGS age-dating of the water suggest the water being pumped today was recharged between 5,000 and 30,000 years ago – water is being mined and not readily replenished.

The major aquifer units are in a state of overdraft. Overdraft is currently estimated to be up to 430 acre-feet per year, and is projected to increase to up to 660 acre-feet per year by 2030 without action to import supplemental supply and build recharge projects.

The Mojave Water Agency began delivering imported State Water Project Water through the 71-mile Morongo Pipeline in 1995. This facility was a joint effort of Joshua Basin Water District, Hi-Desert Water District, the Bighorn-Desert View Water Agency and San Bernardino County Service Area 70. To date, JBWD has not utilized any water from this source.

The pipeline will deliver water to percolation ponds that act as natural filtration systems as the water seeps back into the ground to recharge the aquifer. If no project is constructed, the aquifers would continue to be overdrafted and the long-term viability of the community threatened. An alternative to groundwater percolation ponds would be the construction of a surface water treatment plant.

If the recharge project proposed for grant funding is not constructed, a local water treatment plant would be constructed instead. Since the regional water treatment plant would be dependent on the variability of State Water Project supplies, there would need to be significant redundancy in the surface water and groundwater production capabilities to avoid severe rationing in the event of a drought or supply outage.

A conveyance pipeline similar to the one proposed to serve the recharge ponds would still be required. The cost of the recharge pond pipeline is assumed as the cost of the water treatment plant pipeline in. The water treatment plant is assumed to have a 40 year useful life before major replacements are required (Source: 2010, IRWM Prop 84 Grant Application, Mojave Water Agency).

The overall Water Recharge Facility Project elements are shown in Figure 1-2. The project can be divided into two primary components: Delivery facilities and recharge facilities.

DELIVERY FACILITIES - The proposed Water Recharge Facility Project consists of construction of a 16-inch pipeline that will connect to the existing Morongo Basin Pipeline, located along JBWD boundary in the vicinity of Yucca Mesa Road and Barron Drive. The pipeline will be constructed within public rights-of-way.

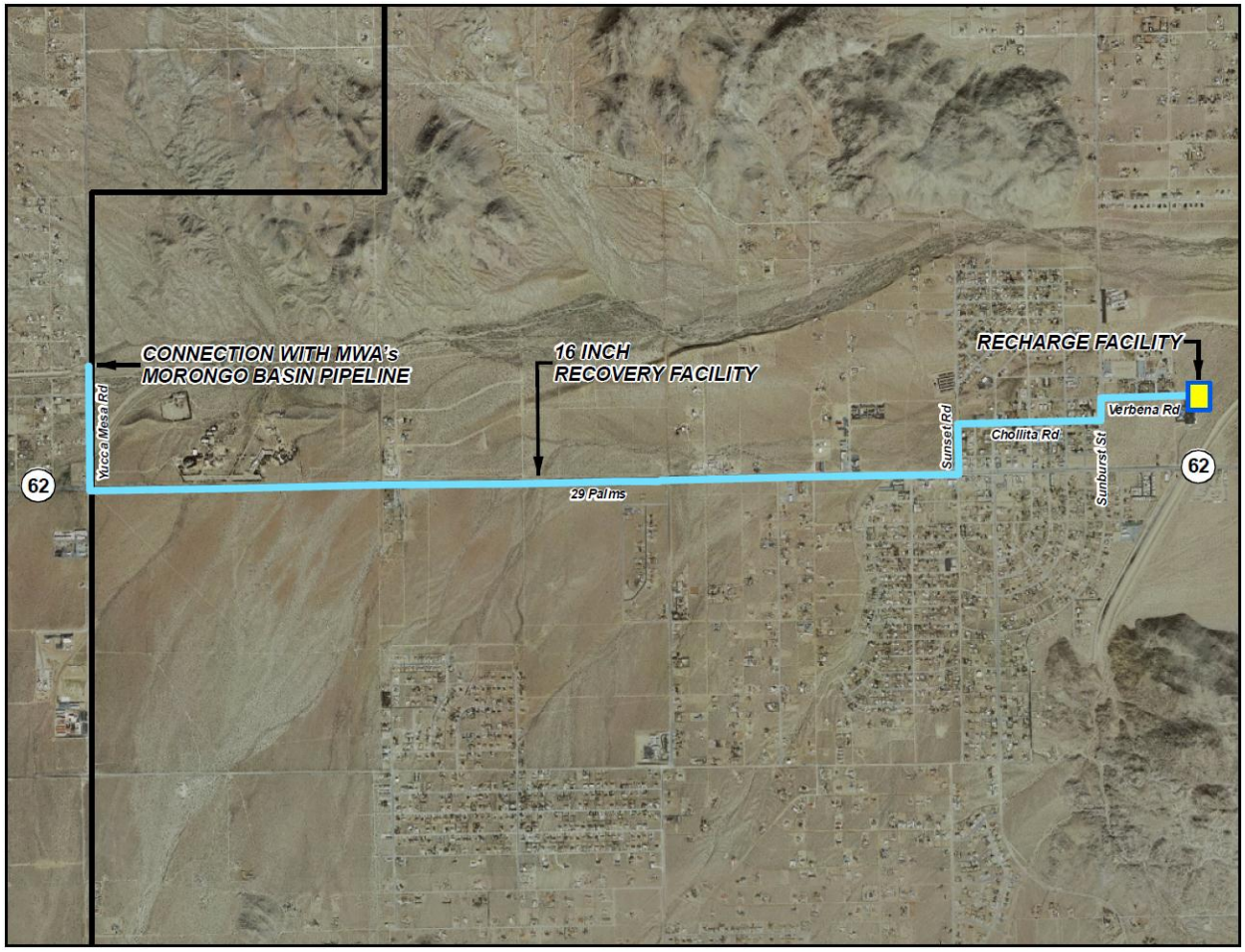
RECHARGE FACILITIES - Recharge basin size requirements are based on a one-foot per day infiltration rate at each site. The proposed project would require a total area of 29 acres for basin construction, which would include 22 wet acres. The project would involve construction of multiple (up to six) six- to seven foot deep subbasins within one of the recharge basin alternative locations. The subbasins would be separated by overflow earthen weirs, allowing water to flow from subbasin to subbasin as needed. The basins would fill by gravity and no pumping equipment would be needed. Control valving would be used to add water to the various subbasins, if necessary. These valves would be contained within a small building on the site.

Water levels within the basins would not exceed original grade elevation and would be maintained at depths of three to five feet. Annual average recharge is anticipated to be approximately 2,000 afy; however, with the availability of water being less than a full year, each site would be designed to allow the 2,000 af recharge with a 50 percent water delivery schedule. Therefore, the recharge basins would be able to accommodate a total capacity of up to approximately 4,000 af for half of the year in order to meet the goal of 2,000 afy of recharge. In addition, because recharge basin operations require periodic drying and scarifying of the basin surfaces in order to assure desired infiltration rates, one or more of the basins could be out of service at any given time.

A six-foot high earthen berm would surround the recharge basin to provide visual screening. The perimeter berms would not be used to impound water or provide freeboard. The recharge basin site would also be fenced with eight-foot chain-link fence.

RECOVERY FACILITIES - There are no recovery facilities on site. The recharged groundwater will flow normally in the direction of hydraulic gradient and will be recovered through existing potable water wells that are part of the JBWD's potable water distribution system. A monitoring well will be constructed on site for purposes of monitoring the recharge effort. However, this well is not part of the water distribution system.

FIGURE 1-2 – WATER RECHARGE FACILITY PROJECT



2 STATEMENT OF PROBLEMS AND NEEDS

JBWD's fundamental objective is to manage declining groundwater quality and quantity in its Copper Mountain and Joshua Tree groundwater basins. In accordance with the objectives adopted from 1996 JBWD Groundwater Management Plan (GWMP), JBWD is obligated to manage the local groundwater basins.

The California State Legislature passed Assembly Bill 3030 (AB 3030) during the 1992 legislative session allowing local agencies to develop Groundwater Management Plans (GWMPs). The legislation declares that groundwater is a valuable resource that should be carefully managed to ensure its safe production and quality. The legislation also encourages local agencies to work cooperatively to manage groundwater resources within their jurisdiction. Senate Bill 1938 (SB 1938) was passed by the Legislature on September 16, 2002 and made changes and additions to sections of the Water Code created by AB 3030.

JBWD's 1996 GWMP, adopted on February 17, 1997 by Ordinance 97-1, serves as the GWMP for JBWD. It contains all the relevant components related to Groundwater Management Plans in California Water Code Sections 10750-10753.10., as well as the components recommended by the California Department of Water Resources (DWR) in California's Groundwater, Bulletin 118.

The purpose of the GWMP is to enable JBWD to manage its groundwater quality and supply in a manner that avoids groundwater contamination or excessive overdraft, while simultaneously continuing to provide the present and future residents of its service area with a safe and reliable water supply.

To accomplish the overall objective of the GWMP, JBWD established a number of subsidiary objectives which, when realized, will enable the District to effectively manage groundwater supplies. The District's Management Plan consisted of evaluating and (potentially) adopting a number of management activities, including water conservation measures, groundwater monitoring, groundwater production standards, water export prevention, conjunctive use, groundwater contamination prevention/response, planning agency coordination, and a replenishment assessment.

In addition to the objective set forth by the GWMP, California Water Code Section 79562.5(b) outlines the following four elements of integrated water management planning in particular:

1. Water Supply;
2. Groundwater Management;
3. Water Quality; and
4. Ecosystem Restoration.

Geographically, JBWD is situated in the Mojave Basin, a desert separated from the temperate coastal climate of the Los Angeles Basin by the San Gabriel and San Bernardino mountains approximately 10,000 feet in elevation above mean sea level. Within the Mojave Basin, JBWD's service area extended over Copper Mountain and Joshua Tree groundwater basins. Although, JBWD overlies a significant supply of high quality groundwater, the region's arid environment limits the extent to which the groundwater supply is recharged. The District's basins have been studied in recent USGS reports that identify that little if any natural recharge occurs in these basins. As a result, the local septic systems are the predominant recharge mechanism resulting in the ongoing increase in nitrate levels.

The Mojave River and other tributary drainage channels to the Copper Mountain and Joshua Tree groundwater basins are dry during most months of most years, and surface flow is an unreliable source of water except in infrequent intense storm periods. As a result, water users in JBWD's service area rely entirely on groundwater supply.

Currently in a state of overdraft, the observed water level within these basins has been lowered by approximately 35 feet over the last 45 years. In 2004, the United States Geological Survey (USGS) completed a study concluding that approximately 1,600 acre-feet per year (afy) is being pumped from the basins which have an in-flow of approximately 1,200 afy. This comparison of average annual supply and current levels of consumptive use within JBWD's service area shows that consumptive use exceeded average annual water supply from natural sources by 400 afy, suggesting that under current conditions, JBWD would need to import 400 acre-feet of supplemental water per year to ensure that consumptive uses for water were met without net groundwater overdraft. Since 1978, MWA is supplemented by periodically deliveries from SWP water but these deliveries can not reach JBWD due to lack of delivery facilities.

As discussed above, the amount of groundwater extracted has exceeded the estimated amount recharged, leading to the overdraft condition. Limited or short-term overdraft is not considered a significant threat; however, excessive overdraft can result in significant problems, such as storage capacity reduction, water quality degradation, groundwater quality reductions, and surface subsidence.

2.1 JBWD Objectives and Problems

The Secretary of the Interior, acting pursuant to the Reclamation Act of 1902 and Acts amendatory thereof and supplementary thereto (hereafter "Federal reclamation laws"), is directed to undertake a program to investigate and identify opportunities for reclamation and reuse of municipal, industrial, domestic, and agricultural wastewater, and naturally impaired ground and surface waters, for the design and construction of demonstration and permanent facilities to reclaim and reuse wastewater, and to conduct research, including desalting, for the reclamation of wastewater and naturally impaired ground and surface waters.

Within this context, JBWD's role is to provide reliable supplemental water supplies to the Judgment[1] to (a) replace supplies produced in excess of an agency's Free Production Allowance and/or (b) to replenish the region's over drafted groundwater basins.

JBWD's objective to address the problems of groundwater overdraft and quality are as follows:

A. Balance future water demands with available supplies recognizing the need to:

- Minimize water quality degradation resulting from lack of natural recharge to the basins;

[1] *Judgment is a management plan developed by the Riverside County Superior Court to manage the water resources of the entire basin (Historical Background of Judgment is provided in Appendix A).*

- Stabilize the groundwater basin storage balance over long-term hydrologic cycles;
- Limit the potential for well dewatering, land subsidence, and migration of poor quality water;
- Maintain a sustainable water supply through extended drought periods; and
- Select projects with the highest likelihood of being implemented.

B. Maximize the overall beneficial use of water throughout JBWD by future water demands with available supplies recognizing the need to:

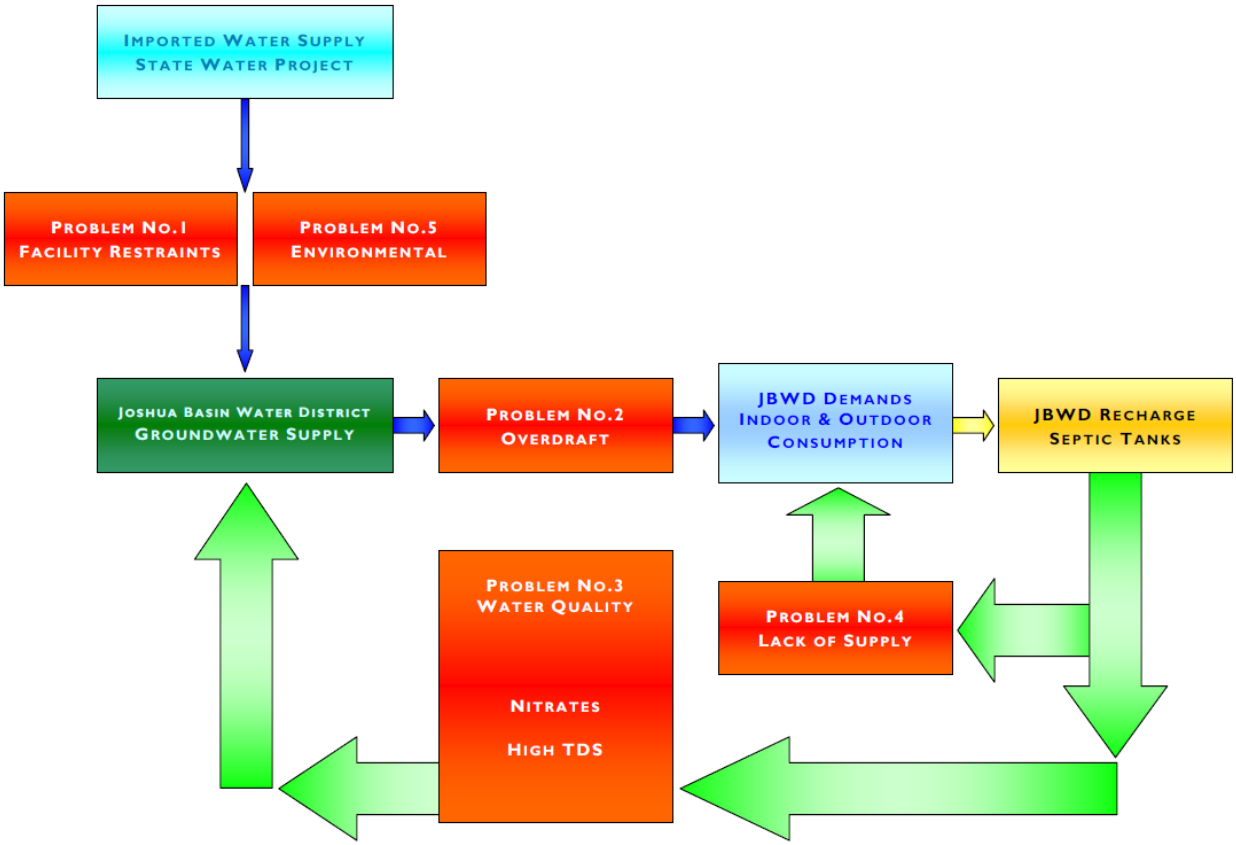
- Supplying water in quantity and quality suitable to the various beneficial uses;
- Addressing issues throughout the JBWD service area recognizing the interconnection and interaction between different areas;
- Distributing benefits that can be provided by JBWD in an equitable and fair manner;
- Ensuring that costs incurred to meet beneficial uses provide the greatest potential return to beneficiaries of the project(s);
- Avoiding redirected impacts; and
- Identifying sustainable funding sources, including consideration of affordability.

SWP water that would be delivered to the JBWD under the Water Recharge Facility Project would provide remediation of the ongoing water quality degradation, relief of the overdraft condition, eliminate ongoing overdraft by enabling the District to meet current water demands, or provide basin reclamation by bringing in slightly more water than the demand. The Proposed Project is currently designed and waiting for grant funding for construction to begin. The completion of this project can help JBWD to overcome the following problems encountered by the District:

1. **Problem No.1 - Existing System Constraints to Import SWP Water:** The lack of facilities that would allow for banking SWP water deliveries through MWA's Morongo Basin Pipeline and utilizing this water to meet local demands when necessary prevents JBWD from using its full entitlement of SWP water.
2. **Problem No.2 - Groundwater Basin Overdraft:** Overdraft occurs in all areas within each basin, and can cause wells to go dry, water quality to be degraded, land to subside, and riparian habitats to be affected. By 2035, water demands are projected to be 2,177 AFY and supply without SWP water will 982 AFY, resulting in water demands to exceed supply by 1,195 AFY.
3. **Problem No.3 - Water Quality:** Groundwater quality is affected by high level of nitrates, arsenic, and chromium. Aquifer water quality is impacted by percolation from septic tanks in the region that is the major cause on increased nitrate levels in the groundwater.
4. **Problem No.4 - Lack of Recycled Water Supply:** Lack of recycled water supplies within JBWD's surface area does not provide means to offset irrigation, agricultural, and some industrial water demands that are currently met with potable groundwater supplies.
5. **Problem No.5 - Environmental:** All but the Oeste and Morongo Basin/Johnson Valley subareas have riparian ecosystem maintenance problems.

Figure 2-1 shows the interconnectedness of these problems. It will require a broad effort by JBWD to try to solve them. The sections to follow of this Title XVI Feasibility Study Report addresses each of these problems and identifies how the proposed project will provide effective tools to mitigate these problems.

FIGURE 2-1 – JBWD SERVICE AREA PROBLEMS



2.2 PROBLEM NO.1 – EXISTING SYSTEM CONSTRAINTS TO IMPORT SWP WATER

MWA has a State Water Project contract for a maximum 75,800 acre-feet of water per year, out of which JBWD is entitled for 1,959 AFY. From 1978 through 2001, average annual SWP deliveries made to MWA were only 6,253 acre-feet, however none of the allotted water for JBWD has been delivered. This under-use of JBWD's SWP contract supplies reflects local agency reliance on less-costly groundwater supplies. If JBWD's full SWP supply had been delivered over the same period of time, it would have been possible to substantially reduce (and in some instances fully offset) groundwater overdraft and quality concerns.

JBWD's ability to take delivery of its allotted SWP supply is affected by (a) lack of facilities to convey, recharge, and store this water and (b) funding limitations. The need of the proposed project is to address these two issues.

Approximate cost of this project to deliver SWP water from MWA up to the proposed recharge basins in JBWD is $7 million. The District has approximately $4 million of the project cost, and requires additional funding to complete the project.

The magnitude of the existing facility constraints on JBWD's ability to transport and recharge supplemental supplies will result is deficiency of 1,195 AFY of water supply by the year 2035 as can be illustrated using data from 2010 Urban Water Management Plan (UWMP) as presented in Table 2-1.

TABLE 2-1 – SUPPLY VERSUS DEMAND

Type	2010	2015	2020	2025	2030	2035
Water Demands (AFY)	1,560	1,877	1,944	2,022	2,099	2,177
Water Supply (AFY)	1,560	702	769	847	904	982
Deficiency (AFY)	**0**	**-1,175**	**-1,175**	**-1,175**	**-1,195**	**-1,195**

Through construction of this project, JBWD will be able to receive its annual supply of 1,959 AFY of allotted SWP water until 2022 to account for the deficiency. As per the 2010 UWMP, MWA will continue to supply a percentage of the entitled 1,959 afy to the Morongo Basin Pipeline after JBWD's existing contract with MWA expires in 2022. After the IDM Agreement has expired, MWA will allocate SWP water to meet customer demands in the IDM area in a manner consistent with its universally applied SWP allocation policies. It is reasonable to assume that policies will be similar to the allocation methods MWA has used during the last few years (i.e. shortages will be shared by all MWA customers during dry periods and SWP supplies allocated according to customers' proportionate share of historic deliveries). Therefore, the recharge project will have the availability of long-term water deliveries beyond 2022, thereby extending the project benefit well beyond the 2022 time frame.

2.3 PROBLEM NO.2 – GROUNDWATER BASIN OVERDRAFT

JBWD supplies water to the community of Joshua Tree from the underlying Copper Mountain and Joshua Tree groundwater basins. These groundwater basins overlie a broad hydrologic region, as defined in DWR Bulletin 118-03 as the Colorado River (Region 7) hydrologic region. These groundwater basins within the District's service area are bounded by the Ord and Granite Mountains to the north, the Bullion Mountains to the east, the San Bernardino Mountains to the southwest, and the Pinto and Little San Bernardino Mountains to the south. The groundwater basins are comprised of non-water bearing rock which forms the boundary of the Joshua and Copper Mountain basins. A graphical representation of these basins can be seen on Figure 2-2.

FIGURE 2-2 – JBWD GROUNDWATER BASINS

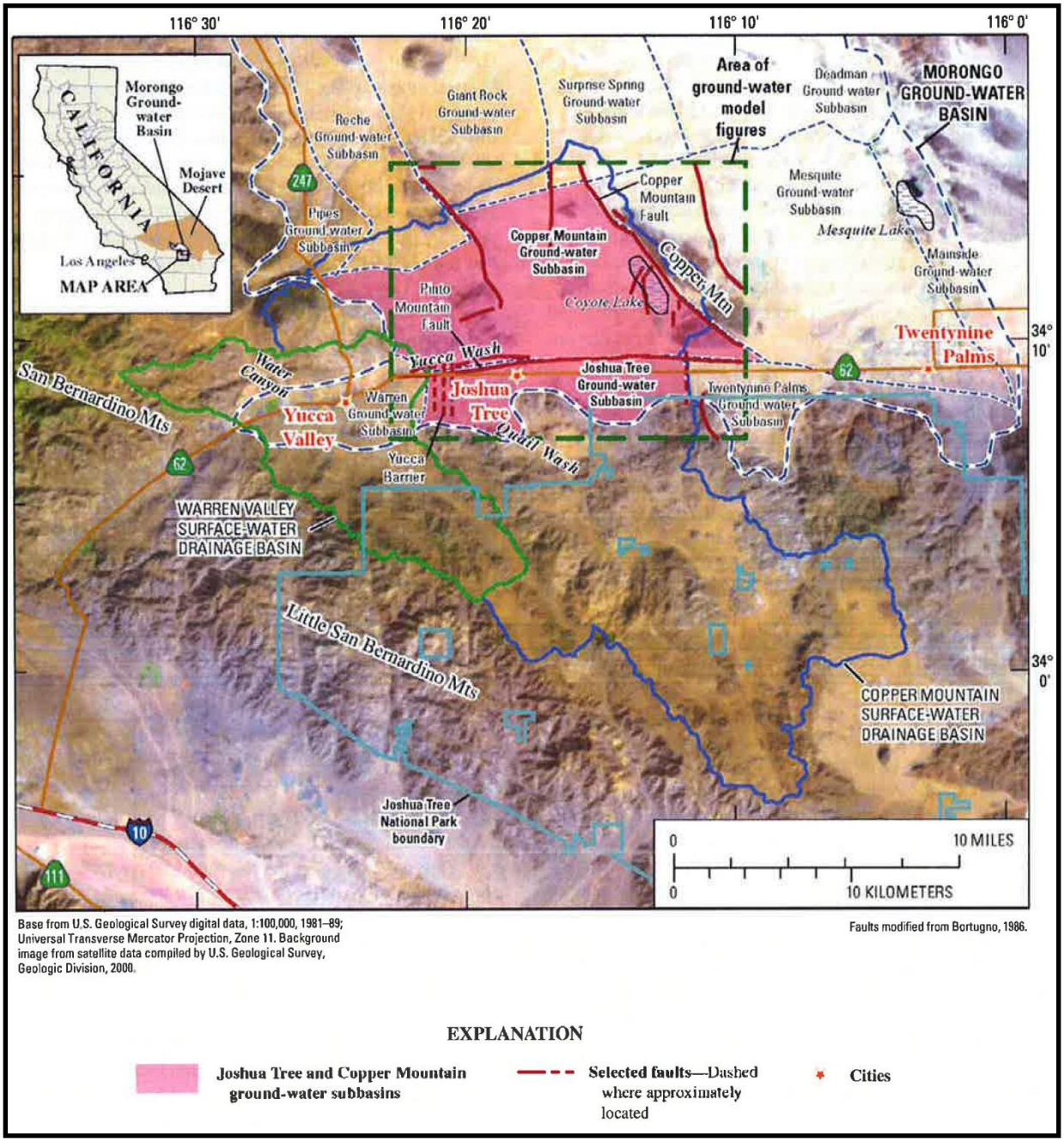


Table 2-2 below presents estimated volume of water stored in Copper Mountain and Joshua Tree groundwater basins.

TABLE 2-2 – JBWD GROUNDWATER BASINS

Parameter	Copper Mountain	Joshua Tree	Combined
DWR Basins	7-11	7-62	397,522
Upper Aquifer Volume	135,885 AF	261,637 AF	761,638 AF
Middle Aquifer Volume	359,863 AF	401,775 AF	1,450,448 AF
Lower Aquifer Volume	284,806 AF	1,165,642 AF	2,609,608 AF
Total Volume	**780,555 AF**	**1,829,054 AF**	**397,522 AF**

These groundwater basins contribute two types of sources of local water supply (1) groundwater and (2) return flow from pumped groundwater not consumptively used. The portion of pumped groundwater that does not return to the aquifer is referred to as consumptive use.

JBWD is concerned with the long-term sustainability of the underlying aquifer that might eventually result in depleted water table, degraded water quality, and dry wells. Currently in a state of overdraft, the observed water level within these basins has been lowered by approximately 35 feet over the last 45 years. In 2004, the United States Geological Survey (USGS) completed a study concluding that approximately 1,600 acre-feet per year (afy) is being pumped from the basins which have an in-flow of approximately 1,200 afy. This would result in a loss of 400 acre-feet of water annually. Overdraft that is continuously occurring in Joshua Tree groundwater can eventually result is dry wells, degraded water quality, land to subside, and riparian habitats to be affected.

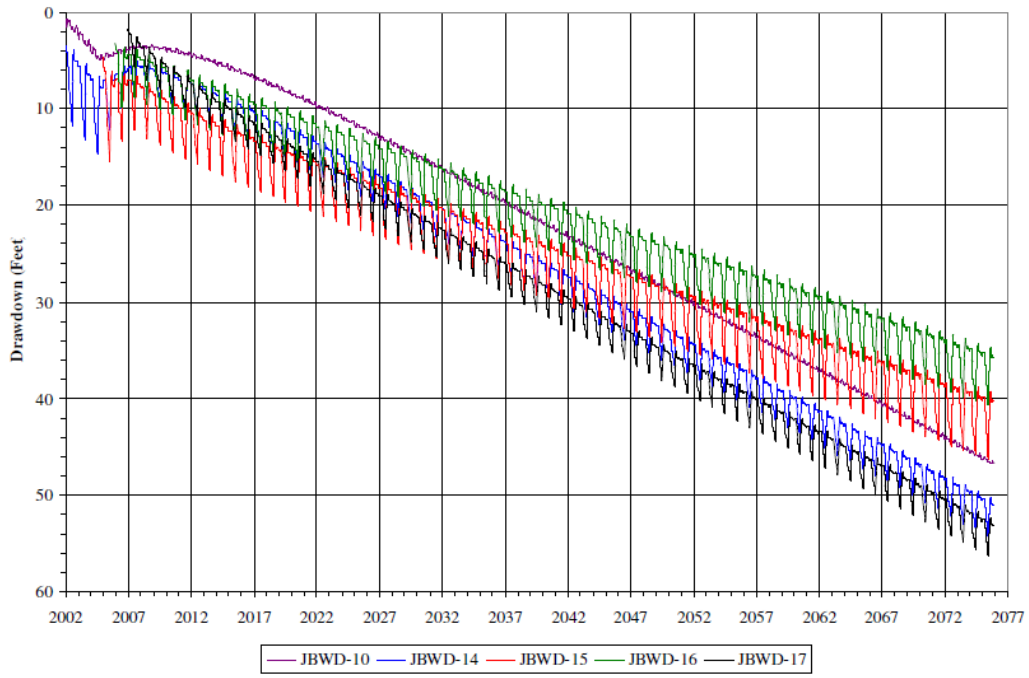
As noted in the 2010 UWMP and in Table 2-1, the underlying groundwater will be insufficient to meet projected future consumptive uses. As a means to reduce the on-going overdraft, JBWD has planed a third source of supply to recharge its groundwater basin that will last a period of 25 years. This recharge alternative is taking the delivery of JBWD's entitled potion of the SWP water from MWA through a newly constructed Water Recharge Facility Project. Table 2-3 below presents a comparison of supplies with and without the enhancement from the third planned supplies over next 25 years.

TABLE 2-3 – JBWD GROUNDWATER BASINS

Water Supply Source	2010	2035
Existing Supply		
Groundwater Production	984 AFY	263 AFY
Return Flow	576 AFY	719 AFY
Total Existing Supply	**1,560 AFY**	**982 AFY**
Planned Supply		
Basin Recharge Project	0 AFY	1,195 AFY
Total Water Supply	**1,560 AFY**	**2,177 AFY**

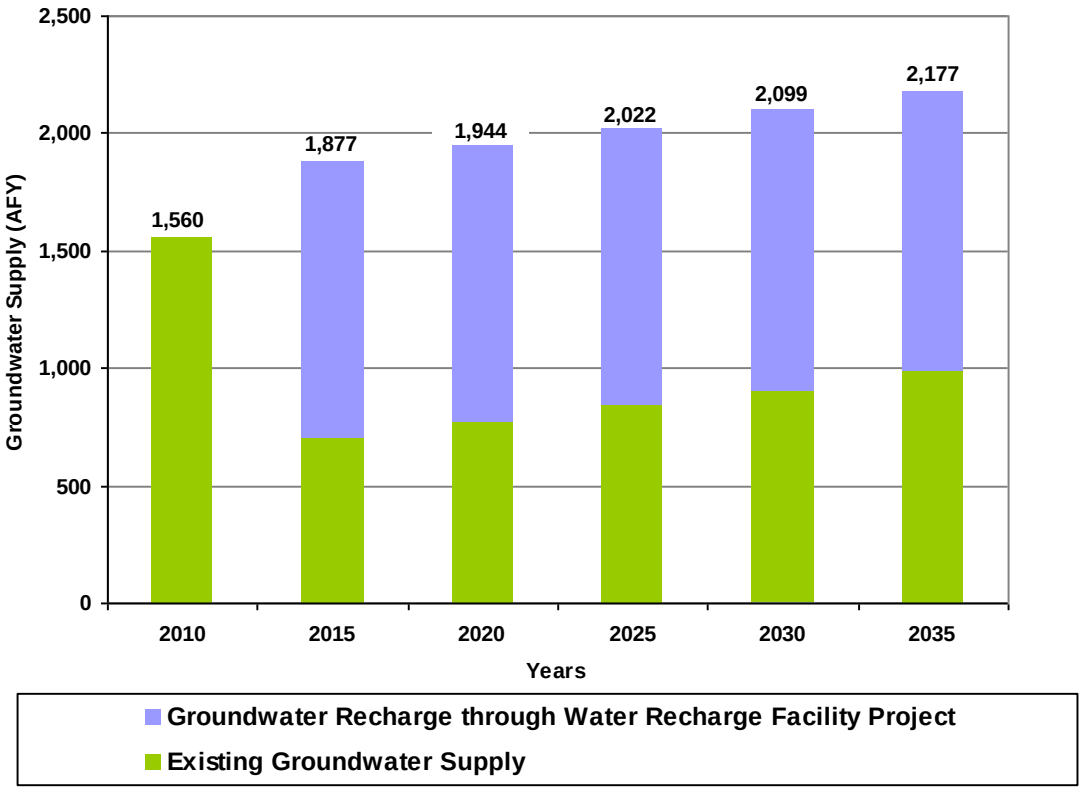
As discussed previously, JBWD is presently reliant upon groundwater for all of its water supply requirements. While the District overlies a significant supply of high quality groundwater, the region's arid environment limits the extent to which the groundwater supply is recharged. Since about 1980, the amount of groundwater extracted has exceeded the estimated amount recharged, leading to a condition known as overdraft. The rate of overdraft over an extended period of time can be seen on Figure 2-3.

FIGURE 2-3 – ESTIMATED OVERDRAFT OVER AN EXTENDED PERIOD OF TIME



To assist the Copper Mountain and Joshua Tree basins to recover from overdraft, the Joshua Basin Recharge Facility Project will create a mechanism for JBWD to make use of MWA imported water via the Morongo Basin Pipeline. The effect of Water Recharge Facility Project on groundwater recharge in five year increments over next 25 years and can be seen on Figure 2-4.

FIGURE 2-4 – EFFECT OF WATER RECHARGE FACILITY PROJECT



2.4 PROBLEM NO.3 – WATER QUALITY

2.4.1 General

The supplemental water brought into the JBWD's service area for recharging groundwater under the proposed project will be from SWP. These SWP supplies are generally of good quality, with total dissolved solids (TDS) of about 200 to 400 mg/L. The indigenous groundwater in the District's service area is of relatively better quality that the entire regional aquifer in MWA. However, high level contamination from nitrates has been observed in recent studies. SWP water, which is of better quality that the groundwater, will help by reducing high levels of nitrates.

The USGS conducted investigations on groundwater recharge and prepared a finite-difference numerical groundwater model for the JBWD in 2003-2004. The results of the USGS study indicated that there are three aquifer zones in the Joshua Tree and Copper Mountain basins. In general, the uppermost aquifer zone is the most permeable and has the best water quality. The USGS study also concluded that it takes approximately 300 years for the intermittent rainfall typical of the area to infiltrate through arroyo bottoms and reach the water table. However, it is more likely that continuous percolation from septic leach fields reach the groundwater table more rapidly than natural recharge along the arroyo bottoms, thus making high level of nitrate a problem. The report also presents data demonstrating that the groundwater in the deepest aquifer zone contains arsenic and hexavalent chromium.

All of JBWD's supply wells are located in the uppermost aquifer. The JBWD currently has five (5) water producing wells, No. 10, 14, 15, 16, and 17. Two of these (No. 15 and 16) are in the Copper Mountain basin. The other three as well as the proposed recharge basins are located within the Joshua Tree basin.

2.4.2 Nitrates

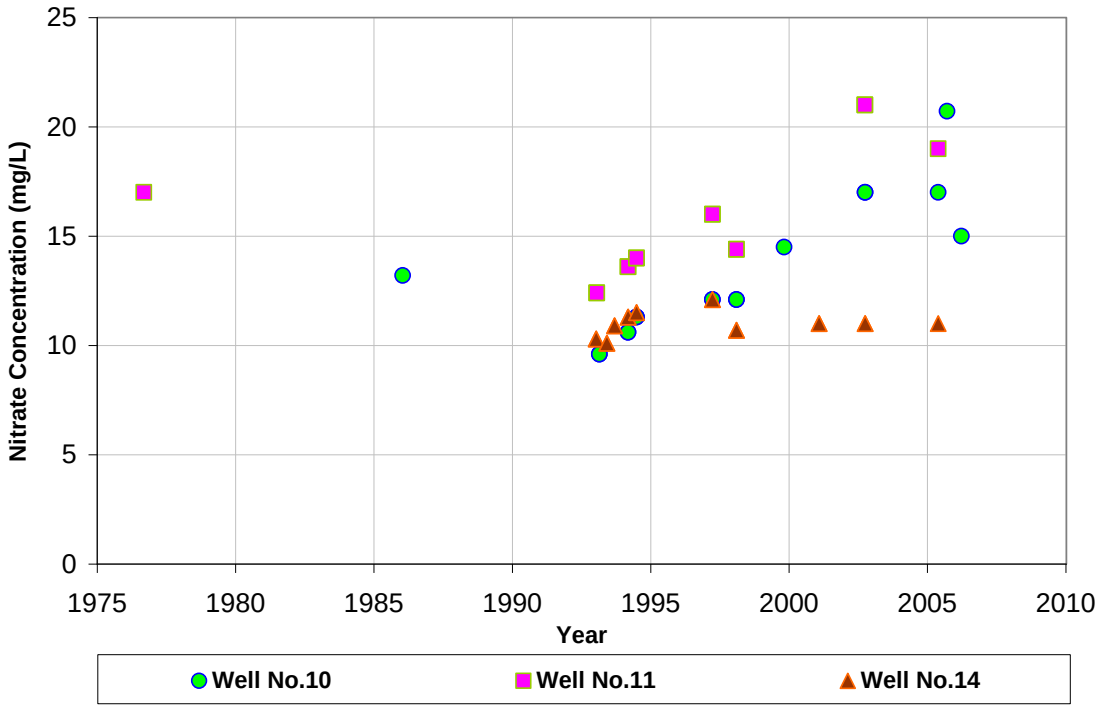
Nitrates build-up in groundwater through percolation from the septic tanks in the District' service area, however the water-quality data indicated that the nitrate concentrations were below the established regulatory MCLs for potable water. Table 2-4 summarizes the minimum, maximum, and average concentrations of nitrates from the water samples taken from Wells 10, 11, and 14.

TABLE 2-4 – NITRATE CONCENTRATION AS NO3

Water Supply Source	Minimum	Maximum	Average
Well No.10	9.6 mg/L	20.7 mg/L	13.3 mg/L
Well No.11	12.4 mg/L	21.0 mg/L	15.6 mg/L
Well No.14	10.1 mg/L	12.1 mg/L	11.0 mg/L

Figure 2-5 below shows the historical nitrate levels as NO3 in Wells 10, 11, and 14 from 1975 to 2010.

FIGURE 2-5 – NITRATE CONCENTRATION AS NO3



One important property of SWP water is the mineral content. SWP water is generally low in dissolved minerals, such as calcium, magnesium, sodium, potassium, iron, manganese, nitrate, and sulfate. Most of these minerals do not have health based concerns. Nitrate is the main exception, as it has significant health effects for infants; however, the nitrate content of SWP water is very low. It is estimated that the blending of low-nitrate supplies from the SWP with the local groundwater has had a dilution effect related to nitrate. Thereby, the JBWD groundwater basins will be reclaimed from ongoing nirate degradation.

2.4.3 Arsenic and Chromium

According to the California Department of Public Health (CDPH) 2006 Annual Compliance Report, 14 of the 120 maximum contaminant level (MCL) violations within the state of California for inorganic contaminants were for Arsenic. These violations were estimated based on the previous MCL of 50 µg/L. Since then, the EPA and the CDPH have lowered the Arsenic MCL to 10 µg/L. There is a possible risk of skin damage, cancer or problems with circulatory system for some people who continuously drink water containing in excess of the MCL over many years.

Arsenic and Chromium have been detected in the lower aquifer and not the uppermost aquifer from where the District takes it well supply. However, with continued overdraft, it is possible that in future years the only source of groundwater supply available if from the lower aquifer. As seen in Table 2-5, the lower groundwater occasionally exceeds regulatory concentration established for arsenic.

TABLE 2-5 – ARSENIC AND CHROMIUM CONCENTRATIONS

Well #	Date	Chromium	Arsenic
10	1/29/1986	<0.01	<0.02
10	3/8/1993	<10.0	<10.0
10	3/8/1993	<10	

Well #	Date	Chromium	Arsenic
10	3/21/1994	12	<5.0
10	3/21/1994	12	
10	7/11/1994	<10.0	<2.0
10	7/11/1994	<10	
10	4/7/1997	<10.0	<2.0
10	4/7/1997	<10	
10	2/18/1998	11.6	<2.0
10	2/18/1998	11.6	
10	10/11/2002	0	0
10	10/11/2002	<10	
10	6/1/2005	11	0
11	2/1/1993	12	<10.0
11	2/1/1993	12	
11	3/21/1994	14	<5.0
11	3/21/1994	14	
11	7/11/1994	<10.0	<2.0
11	7/11/1994	<10	
11	4/7/1997	<10.0	<2.0
11	2/18/1998	13.6	<2.0
11	2/18/1998	13.6	
11	10/9/2002	11	0
11	10/9/2002	11	
11	6/1/2005	14	0
14	6/14/1993	19	<5.0
14	6/14/1993	19	
14	3/21/1994	20	<5.0
14	3/21/1994	20	
14	7/11/1994	<10.0	<2.0
14	7/11/1994	<10	
14	4/7/1997	<10.0	<2.0
14	2/18/1998	18.9	<2.0
14	2/18/1998	18.9	
14	2/12/2001	19	0
14	2/12/2001	19	
14	10/11/2002	11	0
14	10/11/2002	11	
14	6/1/2005	18	0

In January 2006, the U.S. EPA estimated that between 2,300 to 3,000 public water systems still needed to install new central treatment systems, or make other operational changes, to comply with the new 10

ppb maximum contaminant level (MCL) for arsenic. Although blending of multiple water sources to reduce arsenic level is allowed, the California Department of Health Service requires the blend to be lower than 80% of the MCL (i.e. 8 µg/L).

Based on this, and on the fact that local purveyors within the Mojave Basin are limited to utilizing groundwater well pumping for water supply, it is essential for JBWD to (1) maintain the low (or undetected) arsenic levels in areas of good water quality by reducing the overdraft, (2) help mitigate groundwater areas with high arsenic levels by recharging the basin with SWP water, and (3) provide blending opportunities which may (a) prevent the need to deactivate existing wells, (b) eliminate the need for arsenic treatment, and/or (c) allow for constructing new wells in the future in areas that would otherwise be prohibitive (or costly) to install. By implementing the proposed project, JBWD will achieve the following benefits:

1. With SWP water, JBWD would be able to utilize this water to lower arsenic concentrations from existing or future local water supplies, as necessary. It is noted that currently JBWD is not relying on any arsenic contaminated groundwater from the lower aquifer. However, continued overdraft of the basin will only increase the opportunity for arsenic challenges.

2. Decrease in groundwater overdraft, which will decrease the risk of pumping older water that may contain higher levels of nitrates or arsenic.

3. Increase in water supply reliability through reclamation of impaired ground water supplies.

2.4.4 Total Dissolved Solids (TDS)

Total Dissolved Solids is not a major problem in JBWD's groundwater. Generally, TDS tends to increase from salts being released through treated urban wastewater. Data regarding the quantity and quality of SWP water delivered to the MWA service area is readily available from the California Department of Water Resources (DWR). Although the quality of SWP water varies seasonally, for the period between 2005 and 2009 the average total dissolved solids (TDS) concentration has been approximately 269 mg/L for the Morongo area. Total dissolved solids (TDS) concentrations in JBWD's groundwater ranged from 148 to 248 milligrams per liter (mg/L) and average about 180 mg/L. Table 2-6 below presents the TDS levels in some of the groundwater samples taken for Wells 10, 11, and 14 between 1993 to 2003.

TABLE 2-6 – TDS CONCENTRATIONS

Well #	Date	TDS (mg/L)
10	3/8/1993	136.4
10	3/21/1994	140.9
10	7/11/1994	139
10	4/7/1997	148
10	2/18/1998	138
10	10/11/2002	160
11	2/1/1993	138.2
11	3/21/1994	145.5
11	7/11/1994	140
11	4/7/1997	155
11	2/18/1998	141

Well #	Date	TDS (mg/L)
11	10/9/2002	160
14	1/25/1993	165
14	6/14/1993	191.2
14	9/23/1993	154.6
14	3/21/1994	175.4
14	7/11/1994	164
14	4/7/1997	185
14	2/18/1998	173
14	2/12/2001	170
14	10/11/2002	180
Average		**157**

SWP water, used for basin recharge, are also considered as a source of TDS. However, by comparing the SWP TDS levels with the average TDS concentrations across MWA's main sub aquifer, it is concluded that additional SWP water would ultimately help maintain the TDS levels below the MCLs and mitigate any further degradation of the groundwater. This conclusion is supported by a May 2007 groundwater quality analysis for MWA, which indicates that additional SWP water supplies would induce a dilution of the existing TDS concentrations within most of the Mojave Basin subareas. Based on this, the proposed project is considered to be an important tool that will allow JBWD to maintain and/or reduce TDS levels within most of the subareas for the coming years.

2.5 Problem No.4 – Lack of Recycled Water Supplies in the Region

The Victor Valley Wastewater Reclamation Authority (VVWRA), which is a regional wastewater collection, treatment, and reclamation agency serving the cities of Victorville, Hesperia, the Town of Apple Valley, and County Service Areas, is currently the only supplier of recycled water within the boundaries of the Mojave Water Agency.

Lack of recycled water supplies within JBWD's service area does not provide an opportunity to effectively use recycled water for irrigation and other agricultural practices, and some industrial water demands that are currently met with potable groundwater supplies. Agricultural, irrigation, golf course, and other recreational demands that could potentially be served by recycled water, are currently being served by groundwater.

Ongoing plans by VVWRA and other local wastewater agencies to design and construct additional wastewater reclamation facilities in the region in an effort (1) to meet some of the non-potable water demands shown in the area, and (2) to achieve an overall goal of offsetting some of the current potable water demands contributing to the existing groundwater overdraft. However, the cost and time needed to construct these facilities does not help mitigate the basin overdraft concerns in the short run, as the ultimate recycled water system will require the following:

1. The design and construction of multiple sub-regional wastewater reclamation facilities (treatment plants) serving the cities of Hesperia and Apple Valley, and capable of producing title 22 recycled water.

2. Upgrading existing treatment plants (VVWRA, Adelanto, and Barstow) to produce recycled water.

3. The design and construction of a recycled water distribution system consisting of reservoirs, pump stations, and miles of transmission and distribution pipelines extending from the existing and future treatment plants to potential users in the area.

Due to the time and cost constraints to construct these facilities, the proposed project is considered to be a cost-effective solution to mitigate the quality and overdraft challenges before a regional recycled water system is in place, as well as to serve as a long-term measure to maintain and improve groundwater levels and water quality, and increase water supply reliability in the region. VVWRA's 2005 study entitled "Planning and Environmental Service to Develop Sub-regional Reclamation Facilities" (Boyle Engineering, January 2005), indicated that although recycled water is not anticipated to "fix" the overdraft of the Mojave Basin, it will certainly help make wiser use of the limited water resources in the region. This report also indicated that reversing the current overdraft condition may be accomplished primarily by importing SWP water.

JBWD has initiated a Wastewater Treatment Strategy, through which the District will collect funding for a future central wastewater treatment plant from new developments. Developments beyond a 2.0 EDU development threshold are currently required to install package treatment facilities. The Wastewater Treatment Strategy is intended to limit groundwater contamination over time, but does not reduce existing septic tank use. Recharge of the groundwater basin, coupled with long-term wastewater treatment, was studied by the USGS and proven to reduce or eliminate nitrate contamination of the groundwater basins.

Section 3 of this report provides a more detailed description of the existing and future recycled water plan in the region.

2.6 Problem No.5 – Environmental

Exhibit H of the Mojave River Judgment (Judgment) defines riparian areas to be maintained in the Mojave River Floodplain.

All but the Oeste and Morongo Basin/Johnson Valley subareas have riparian ecosystem maintenance challenges. Recharge of exisitng groundwater basins will maintain groundwater levels and enhance the areas ability to sustain protected habitat growth.

2.7 Current and Projected Water Supplies

2.7.1 Existing Water Supply to JBWD Groundwater Basins

Rainfall in the San Gabriel and San Bernardino mountains is the principal source of natural water supply to the Mojave Basin Area. The Mojave Basin is essentially a closed basin as very little groundwater is exchanged between this basin and the areas outside of the basin. However, groundwater is recharged to the basin by:

1. Infiltration of water from the Mojave River

2. Infiltration of storm runoff

3. Return flow through irrigation, fish hatcheries, percolation of wastewater septic fields

Deep Percolation of Precipitation: The deep percolation of precipitation in JBWD is negligible.

Subsurface Flow: There is no sub surface flow from the Mojave River that contributes to the groundwater in JBWD.

SWP Imports: Currently, JBWD has an agreement in place with MWA (called the Improvement District Morongo (IDM) agreement, discussed in Section 3.3.3), in which JBWD is entitled to up to 1,959 afy of SWP water until the year 2022, which they cannot access without the extension of the Morongo Pipeline and construction of planned recharge facilities. SWP water will be brought to the area via the 71-mile long Morongo Basin Pipeline (MBP), which conveys SWP water from the California Aqueduct in the Mojave River watershed to the Hi-Desert Water District (HDWD) and JBWD service areas. Voters approved the financing plan for the $54 million MBP project by more than a two-thirds vote in June 1990.

- MWA has its own conjunctive use program to take advantage of the fact that the available MWA SWP supply on average is still greater than the demand in the service area. MWA is able to store this water for future use when SWP supplies are not available. This activity also allows MWA to take advantage of wet year supplies because of the abundant groundwater storage available in the Basins.

Neither the Joshua Tree nor the Copper Mountain groundwater basin is an adjudicated basin and, as such, there are no deeded rights to withdraw water. Overall management of water resources is the responsibility of the District. The District's 1996 GWMP describes the groundwater basin in detail, and the 2006 Dudek Study estimates existing and future groundwater production rates.

2.8 Current and Projected Water Demands

The 2010 Urban Water Management Plan documented exiting use of water supplies for the period from 2005 through 2035. Based on the population projections, the 2010 UWMP projected water use for JBWD is presented in Table 2-7 below.

TABLE 2-7 – POPULATION AND WATER DEMAND PROJECTION

Water Use Sector[(a)]	2005	2010	2015	2020	2025	2030	2035
Population	9,333	9,969	10,448	11,108	11,551	11,993	12,436
Metered Single-Family	1,184	1,213	1,512	1,552	1,613	1,673	1,733
Metered Multi-Family	58	84	88	94	97	100	105
Metered Comm/Ind	161	244	258	278	291	304	317
Metered Irrigation	0	0	0	0	0	0	0
Metered Other	0	10	10	11	12	12	12
Unaccounted For/System Losses	197	9	9	9	9	10	10
Total	**1,600**	**1,560**	**1,877**	**1,944**	**2,022**	**2,099**	**2,177**

An estimate of supply surplus and deficit can be made under a set of relative simple assumptions:

- Consumptive use would be met with natural supply and SWP supplemental supply
- JBWD would import SWP supplemental supplies to the extent needed to achieve a balance of supply and demand

- Average annual SWP supplies would be available over the period of 2012 through 2020, although there would be some variation is supply availability, and
- No overdraft would occur.

The assumption of no overdraft is essential in determining the net supply versus consumptive use water balance. Overdraft is simply water that must be replaced at a later date. Assuming no overdraft, therefore, assumes that the available supplies would be applied to meet the goals and objectives of the groundwater management plan, which is to bring the system into a sustainable balance. Given these assumptions, a new water balance of JBWD's service area can be projected reflecting different planning scenarios related to supply and consumptive use, such as:

- Scenario 1: Average annual natural supply and average annual SWP supply

- Scenario 2: Average annual natural supply and reduced average annual SWP supply due to multiple drought years

These scenarios provide a good estimate of the potential range of supply vs. consumptive use relationship. The goals and objectives of the proposed project consist of the following:

- Provide additional groundwater recharge, storage, and recovery capacity in the Joshua Basin region;

- Allow the storage of water during wet hydrologic periods for recovery and use during dry periods;

- Provide JBWD customers with increased water supply reliability and quality;

- Reduce the demand for local groundwater; and

- Enhance water supply reliability and quality.

3 WATER RECLAMATION AND REUSE OPPERTUNITIES

This section describes how the proposed project is an integral part of JBWD's Groundwater Management Plan (GWMP) and will provide immediate and continued benefits to the Joshua Tree groundwater basin in the District's service area. Within the context of the GWMP, this section addresses the opportunities for water reclamation and reuse within JBWD's service area, identifies sources of water that can be reclaimed (including impaired ground water), describes challenges associated with water reclamation and reuse, and explains how the proposed project will help mitigate these challenges and help to maximize opportunities for water reclamation and reuse.

3.1 RECLAIMED WATER USES

3.1.1 Current Reclaimed Water Uses

Currently, there is only one direct user of reclaimed water in the Alto subarea of the MWA, which is Westwinds Golf Course, located within the SCLA area of the City of Victorville. However, there are no exiting reclaimed water users in JBWD's service area. Expect for the single user mentioned above, the entire reclaimed water produced in MWA is either discharged to the Mojave River or to percolation ponds for groundwater recharge. Although, there is some groundwater recharge through reclaimed water in certain areas if MWA, none of the JBWD's groundwater basins are recharged through reclaimed water.

The San Bernardino Local Agency Formation Commission's (LAFCO's) January 2011 report stated that the Joshua Tree community area is located within the Colorado River Water Basin and regulated by the Colorado River Regional Water Quality Control Board (Regional Board). The regulating document for this region is the Water Quality Control Plan that was adopted by the Regional Board in 1993 and last amended in November 2002. The Regional Board is currently in the process of developing and updating various regulatory requirements concerning urban runoff, septic systems, groundwater and surface waters in their jurisdiction.

3.1.2 Potential Reclaimed Water Uses

In response to the regional discharge requirements, in 2006 the District requested that the Commission authorize its wastewater function. In 2007, the Commission authorized the District's wastewater function, but limited the services of that function to operation of wastewater package treatment plants and planning and engineering related to regional wastewater service (LAFCO 3074).

LAFCO staff and the Commission did not believe that the wastewater function and service should include the ability to operate a regional wastewater facility at that time. Further consideration by the Commission is required for the District to expand the services to include the actual provision of collection, treatment and disposal of wastewater.

The Regional Board has adopted waste discharge requirements which have resulted in the requirement for installation of package treatment plants for developments approved within the District's boundaries and in other areas under its jurisdiction. In 2009 the District adopted a Wastewater Treatment Strategy to plan for long-term and regional approaches to protecting the groundwater. The strategy identifies 7,000 parcels in one-third of the District (35 square miles), mostly along Twentynine Palms Highway, where densities are currently zoned at levels that requires new development to provide wastewater treatment.

The District actively provides retail water service to residential and commercial customers (no agricultural use is reported) and is authorized to operate wastewater package treatment plants that are limited to a specific area.

Most new construction in the JBWD service area is spread throughout the District and not concentrated in a way that would enable economical use of a central wastewater treatment plant. Recognizing this, the District's wastewater strategy is to require new development with more than 15 equivalent dwelling units (edu's) within the wastewater zone to install package wastewater treatment plants that will be owned and operated by the District. The effluent from the package plants will be disposed of by percolation to the ground, similar to septic tanks. These package plants may be combined as newer ones are constructed. New development will also pay a capacity fee for a central wastewater treatment plant that will eventually be constructed when it is economically viable to do so. The wastewater zone comprises about 35 of the 96 square miles of the District boundaries. It is anticipated that current development will not be required to connect to a wastewater treatment plant unless mandated by future local, state, or federal requirements.

Within the JBWD service area, there is currently no recycled water source. The only potential source for recycled water would be wastewater flow from any new development in the JBWD service area that could be treated to become recycled water if and when JBWD constructs a central wastewater treatment plant. This is not likely to occur in the near future.

If and when JBWD develops a future recycled water delivery system, methods to encourage recycled water use, such as financial incentives, will be analyzed at that time.

3.1.3 Groundwater Use in JBWD

JBWD is responsible for the overall management of the groundwater resources pursuant to the Joshua Basin Water District AB3030 Groundwater Management Plan. JBWD has initiated projects that will contribute towards the overall management of its groundwater resources and help prevent further decline of its groundwater. Key water management issues associated with declining groundwater levels, which JBWD is seeking to resolve include:

1. Current demands exceed supplies; future demands will also exceed supplies unless corrective actions are taken.
2. Naturally occurring water quality problems affect drinking water supplies, such as high level of nitrates.
3. The groundwater basins within JBWD's service area are in overdraft.
4. The subareas have riparian ecosystem maintenance issues.
5. Lack of wastewater infrastructure issues affect and reliance on septic tanks affects groundwater quality.
6. Many subareas within JBWD are impacted by activities in other subareas.

Based upon these issues, JBWD established two fundamental objectives:

1. Balance future water demands with available supplies; and
2. Maximize the overall beneficial use of water throughout JBWD.

Copper Mountain and Joshua Tree Groundwater Basins

Copper Mountain and Joshua Tree groundwater basins overlie a broad hydrologic region as defined in DWR Bulletin 118-03 as the Colorado River (region 7) hydrologic region. These groundwater basins within the District's service area are bounded by the Ord and Granite Mountains to the north, the Bullion Mountains to the east, the San Bernardino Mountains to the southwest, and the Pinto and Little San Bernardino Mountains to the south. The groundwater basins are comprised of non-water bearing rock which forms the boundary of the Joshua and Copper Mountain basins. These groundwater basins contain over 600,000 acre-feet (af) of water. A detailed breakdown of the storage volume on these basins is presented in Table 3-1 below.

TABLE 3-1 – JBWD GROUNDWATER BASINS

Paramerter	Copper Mountain	Joshua Tree	Combined
DWR Basins	7-11	7-62	397,522
Upper Aquifer Volume	135,885 AF	261,637 AF	761,638 AF
Middle Aquifer Volume	359,863 AF	401,775 AF	1,450,448 AF
Lower Aquifer Volume	284,806 AF	1,165,642 AF	2,609,608 AF
Total Volume	**780,555 AF**	**1,829,054 AF**	**397,522 AF**

The District's sole source of water is the groundwater that is pumped from these basins. These groundwater basins contribute as two types of sources of local water supply (1) groundwater and (2) return flow from pumped groundwater not consumptively used. The portion of pumped groundwater that does not return to the aquifer is referred to as consumptive use. Recent historical and projected groundwater pumping for the JBWD service area is summarized in Tables 3-2 and 3-3 below.

TABLE 3-2 – JBWD HISTORICAL GROUNDWATER PRODUCTION (AFY)

Type	2005	2006	2007	2008	2009
JBWD	1,600	1,560	1,875	1,515	1,690

Source: DWR PWSS Reports by JBWD.

TABLE 3-3 – JBWD PROJECT GROUNDWATER PRODUCTION (AFY)

Type	2010	2015	2020	2025	2030	2035
JBWD	1,560	1,877	1,944	2,022	2,099	2,177

Note: Groundwater production projections are based on the GPCD remaining at the 2008 level (129 GPCD) of total production projections in the MWA forecast model.

To assist with the Copper Mountain/Joshua Tree subbasins overdraft, the Joshua Basin Recharge Project (see Section 3.3) will create a mechanism for JBWD to make use of MWA imported water via the Morongo Basin Pipeline. Currently, JBWD has an agreement in place with MWA in which JBWD is entitled to up to 1,959 afy of SWP water via the Morongo Basin Pipeline, which they cannot access without the extension of the Morongo Pipeline and construction of recharge facilities that would occur under the proposed Project. The Joshua Basin Recharge Project provides needed recharge into the Copper Mountain/Joshua Tree basins to relieve overdraft conditions.

Table 3-4 summarizes the net average annual water supply estimates for each of the basins that comprise the JBWD service area. The net average water yield of the entire JBWD service area is about 200 afy as documented in the 2004 USGS Nishikawa et al. Evaluation completed in cooperation with

JBWD. This number generally represents the safe or perennial yield of the basins based on varying levels of data as summarized below.

The perennial yields described above are maintained for both a single dry year and multiple dry year scenarios in Table 3-4. Although recharge to the groundwater basin is typically less during dry years, the perennial yield values account for the transient nature of recharge in the groundwater system. Due to the time lag associated between recharge and change in groundwater storage near supply wells, these basins are considered reliable in both dry and wet years if long-term overdraft is avoided.

TABLE 3-4 – JBWD GROUNDWATER BASINS SUPPLY RELIABILITY (AFY)

Anticipated Supply	Normal Year	Single-Dry Water Year	Multiple-Dry Water Year
Joshua Tree/ Copper Mountain[(a)]	200	200	200

Note: (a) USGS Nishikawa et al., 2004.

JBWD groundwater basins receive its water supply from several sources:

- Surface water inflow from adjacent basins
- Subsurface inflow from adjacent basins
- Deep percolation of precipitation

Long term average natural groundwater supply and consumptive use is predicted to be 982 AFY and 2,177 AFY, respectively. Outflows and consumptive uses include:

- Surface water outflows to adjacent basins
- Subsurface outflow to adjacent basins
- Consumptive use due to urban water demands

The data comparison of natural groundwater supply with the predicted consumptive use shows an overdraft.

3.1.4 Water Conservation

Fundamental to JBWD's stated goals is the reduction of groundwater production through water conservation. JBWD is actively engaged in water conservation education and incentive programs and is a participating member of the Alliance for Water Awareness and Conservation (AWAC). AWAC's goals are to educate the local communities with the understanding of the importance of water conservation and provide local communities with the tools to effectively reduce the per capita consumption to targeted goals. These goals include reducing regional water use by 10-percent gross per capita by 2010 and 15-percent gross per capita by 2015 to achieve a sustainable, reliable water supply to meet regional water demands.

3.1.5 Groundwater Quality

As discussed previously in this report, the District has documented a long-term challenge with nitrate concentrations within its groundwater basins, which will be corrected through the proposed recharge project. Without the proposed recharge facilities, the District will be required to treat its water

supplies prior to distribution. Treatment technology varies, depending upon the contaminant. However, the least costly treatment would be blending, if a blending source were readily available. The highest water treatment cost would most likely be associated with a membrane-type treatment, such as reverse osmosis for reduction of TDS.

3.2 Markets Available to Utilize Reclaimed Water

3.2.1 Identification of Potential Users

Within the JBWD service area, there is currently no recycled water source. The only potential source for recycled water would be wastewater flow from any new development in the JBWD service area that could be treated to become recycled water if and when JBWD constructs a central wastewater treatment plant. This is not likely to occur in the near future.

MWA role in the Mojave Basin is to manage declining ground water levels, address basin water quality issues, riparian ecosystem challenges, and subarea interactions. To fulfill these objectives, MWA performs the following functions:

- Acts as the wholesale administrator of State Water Project water delivered to parties within the MWA service area;
- Is the current Court-appointed Watermaster for the Mojave Basin Area Judgment
- Conducts monitoring programs and special studies throughout the Mojave Water Agency territory; and
- Prepares RWMP's to plan water supplies and use in the Agency through 2020.

MWA does not have a direct role in developing reclaimed water markets within its service area. Instead, MWA's role is management of the basin, which includes monitoring and reporting the basin's water supply conditions, of which recycled water development, discharge, and use are key components.

3.2.2 Consultation with Potential Recycled Water Customers

This Section does not apply to the Water Recharge Facility Project.

3.2.3 Description of Market Assessment Procedures Used

This Section does not apply to the Water Recharge Facility Project.

3.3 Challenges to Implementing Water Reuse Project

3.3.1 Water Quality and Groundwater Overdraft

The Porter-Cologne Water Quality Control Act defines "water quality objectives" as the allowable "limits or levels of water quality constituents or characteristics which are established for the prevention of nuisance within a specific area." Thus, water quality objectives are intended to protect the public health and welfare, and to maintain or enhance water quality in relation to the existing and/or potential beneficial uses of the water. Further, as part of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" a non-degradation policy for the protection of water quality exists which states that, "Whenever the existing quality of water is better than the quality of water established in this Basin Plan as objectives

(both narrative and numerical), such existing quality shall be maintained unless appropriate findings are made under this policy."

This "Nondegradation Objective" applies to all groundwaters within the RWQCB, Lahontan Region's jurisdiction. The Water Quality Control Plan for the Lahontan Region (i.e. Basin Plan), states that groundwater overdraft can affect water quality, particularly in terms of total dissolved solids and organic compounds. While water recycling provides a reliable and sustainable alternative water supply that can offset groundwater production, high salt content (as compared to the ambient TDS concentrations in the groundwater supply) can, over time, result in a regional increase in salinity concentration of the groundwater in the absence of water recharge supplies that can reverse overdraft conditions, and/or plans for exporting salt from the basin.

Typically, salt export involves advanced wastewater treatment (such as reverse osmosis) that removes much of the TDS from the wastewater. The resulting brine waste can be disposed of by several alternative methods. One method is to convey the brine to another treatment plant for further processing. A second alternative is to send the brine to lined spreading basins to evaporate the brine, leaving the solids to be disposed of. A third alternative is to dispose of the brine using a zero liquid discharge (ZLD) technology. ZLD typically produces an inert crystallized salt that can be disposed of. Some or all of these brine disposal options can be cost-prohibitive, depending on the specific project conditions. A cost-effective alternative to advanced treatment for reduction of TDS is to implement a water recharge program. If a high quality water source is available, water recharge can effectively blend down the higher TDS water being produced from the reclamation facilities. This alternative provides significant benefits to the both the groundwater basin and the reclamation project.

The proposed project provides an average of 1,959 AFY of SWP water into the Joshua Tree groundwater basin for purposes of groundwater recharge. This project will not only help to reverse the basin's overdraft condition, it will also provide a high quality source of water to maintain water quality in the basin, while implementing a regional water recycling program. By implementing this project, potential long term effects of increasing salt concentrations can be minimized.

JBWD recognizes that SWP water does have a TDS concentration that is marginally higher than some groundwaters found within the District's basins. However, as stated in the Basin Plan, Chapter 3,"Under the State Nondegradation Objective, whenever the existing quality of water is better than that needed to protect all existing and probable future beneficial uses, the existing high quality shall be maintained until or unless it has been demonstrated to the State that any change in water quality will be consistent with the maximum benefit of the people of the State, and will not unreasonably affect present and probable future beneficial uses of such water."

3.3.2 Recycled Water Development Dependent upon Local Development

Implementing a recycled water project on its own (i.e. without a project such as Water Recharge Facility Project) will not provide an immediate solution to the basin's overdraft or quality issues for several reasons. First, the water quality degradation issue previously discussed. Second, a reliable water recycling project has to be developed.

Most new construction in the JBWD service area is spread throughout the District and not concentrated in a way that would enable economical use of a central wastewater treatment plant. Recognizing this, the District's wastewater strategy is to require new development with more than 15 equivalent dwelling units (EDU's) within the wastewater zone to install package wastewater treatment plants that will be owned and operated by the District. The effluent from the package plants will be disposed of by percolation to the ground, similar to septic tanks. These package plants may be combined as newer ones are constructed. New development will also pay a capacity fee for a central

wastewater treatment plant that will eventually be constructed when it is economically viable to do so. The wastewater zone comprises about 35 of the 96 square miles of the District boundaries. It is anticipated that current development will not be required to connect to a wastewater treatment plant unless mandated by future local, state, or federal requirements.

Within the JBWD service area, there is currently no recycled water source. The only potential source for recycled water would be wastewater flow from any new development in the JBWD service area that could be treated to become recycled water if and when JBWD constructs a central wastewater treatment plant. This is not likely to occur in the near future.

Conversely, the proposed project is not dependent upon the presence of local development for its implementation. This project will receive SWP water, and provide delivery infrastructure to allow the District to take this water when there is a demand for it. Therefore, the demand for banked water need not be immediate. Quality improvement will benefit existing users.

3.4 Water and Wastewater Agencies Having Jurisdiction in Potential Service Area

Joshua Basin Water District is the only water and wastewater agency having jurisdiction in the proposed project's service area.

3.5 Description of Potential Sources of Water to be Reclaimed, Including Impaired Groundwaters

The Water Recharge Facility Project is intended to provide a reliable source of high quality SWP water that can be used to cost-effectively reclaim local impaired groundwater sources. On January 23, 2006, the maximum contaminant level for arsenic in US drinking water supplies changed from 50 µg/L down to 10 µg/L. Arsenic is a toxic chemical element that is naturally distributed in soil, rocks, and minerals. Drinking water with arsenic levels that exceeds the EPA's standards over a long period of time could cause skin damage, circulatory system problems and increase the risk of getting cancer. The nitrate challenges of the District are just beginning. Continued low natural recharge and local septic tank use will only increase nitrate contamination. The proposed project will reclaim the existing water supplies and mitigate nitrate contamination. The proposed project water can either replace or be a source of blending supply for water that has other contaminant concerns, manganese, nitrate, chromium and TDS.

3.6 Source Water Facilities

The proposed project will use SWP water as its source for regional groundwater recharge and recovery. MWA is a SWP contractor, with a total annual entitlement of 75,800 acre-feet. MWA takes deliveries of SWP water from the California Aqueduct and delivers this water using its Morongo Basin and Mojave River pipelines. The proposed project will take delivery of an average of 1,959 acre-feet of SWP water from MWA's Morongo Basin pipeline at the South of Rock Springs Turnout.

3.7 Current Water Reuse Programs

Current water reuse programs are discussed in Section 3.1.1, Current Reclaimed Water Uses in the Subarea.

3.8 Water Reclamation and Reuse Technology

This Section does not apply to the proposed project.

4 DESCRIPTION OF POTENTIAL ALTERNATIVES

4.1 STATEMENT OF OBJECTIVES FOR ALL ALTERNATIVES

The fundamental objective for all water supply alternatives developed and analyzed by JBWD is to try to balance future water demands with available supplies and to maximize the overall beneficial use of water throughout JBWD's service area. Potable water for the community of Joshua Tree area is supplied entirely by groundwater. The current demand in the area requires that approximately 1,600 afy be pumped from the basins, but the Joshua Tree Sub-basin only receives a recharge of approximately 1,200 afy, resulting in an overdraft of approximately 400 af. Future water demand is projected to increase over the next 25 years, which will cause further overdraft. The proposed project would provide a source of imported water in order to alleviate the overdraft condition of the groundwater basin, and provide greater water supply reliability for the future of the region.

Following are the objectives of the proposed project:

- Provide additional groundwater recharge, storage, and recovery capacity in the Joshua Basin region
- Allow the storage of water during wet hydrologic periods for recovery and use during dry periods, to provide JBWD customers with increased water supply reliability
- Reduce the demand for local groundwater
- Enhance water supply reliability and quality

JBWD aims to accomplish this by recognizing the need to (1) maintain a sustainable water supply through extended drought periods (Problem No.1), (2) stabilize the groundwater basin storage balance over long-term hydrologic cycles (Problem No.2), (3) limit the potential for well dewatering, land subsidence, and migration of poor quality water, (4) supply water in quantity and of quality suitable to various beneficial uses, especially in the absence of much needed recycled water supplies in the region (Problem No.4), and (5) protect and restore riparian habitat areas.

Balancing future water demands with available supplies will increase water supply reliability by preventing continued overdraft of the groundwater. With groundwater storage stabilized, there will be groundwater available during surface water supply shortages and delivery interruptions. With a balanced basin, groundwater elevations will be relatively stable and be kept above historic low. This will reduce the potential for land subsidence and associated aquifer compaction. By limiting migration of poor quality water, available supplies will be of sufficient quality to meet drinking water objectives, thereby increasing long-term water supply reliability.

4.2 WATER SUPPLY ALTERNATIVES

4.2.1 Supply Enhancement Projects and Management Actions (2004 MWA RWMP)

In 2004, the Mojave Water Agency (MWA) prepared a Regional Water Management Plan (RWMP) and Program Environmental Impact Report (PEIR) that evaluated water supply and demand throughout the MWA service area including within the JBWD service area. As part of this evaluation, projects and management actions were proposed to meet future water supply needs. The proposed Recharge Basin and Pipeline Project was included within the MWA RWMP as a moderate priority water supply

enhancement project for JBWD. The proposed recharge basin sites were identified along State Route (SR) 62. The RWMP evaluated alternatives and concluded that the JBWD recharge project would constitute the most appropriate means of providing water supply and storage to meet future JBWD service area demands.

4.3 WATER SUPPLY ALTERNATIVES EVALUATED IN THE EIR

According to the CEQA Guidelines, an EIR must describe a reasonable range of alternatives to a proposed project that could feasibly attain most of the basic project objectives, and would avoid or substantially lessen any of the proposed project's significant environmental effects. The sections below summarize the alternatives analyzed in the 2009 EIR to identify feasible alternatives. The 2009 EIR also describes the rationale for selection and rejection of alternatives.

Section 15126.6(f) of the CEQA Guidelines provides direction on the required alternatives analysis. As per the CEQA guidelines, the range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making.

4.3.1 Alternative 0: Surface Water Treatment (Alternative Considered But Rejected)

During the planning process, JBWD considered surface water treatment as an alternative to recharge basins to help meet the district's water supply demands. A surface water treatment alternative would involve the construction of reservoir that would serve to supplement the region's source of potable water instead of relying only on the groundwater supply. To meet the water supply demands of the region, this reservoir would have to be very large, which posed site location constraints and would involve significantly greater impacts than the proposed recharge basins. Therefore, a surface water supply alternative was rejected from further consideration.

This alternative was considered by JBWD, but was rejected as infeasible. Alternatives may be eliminated from detailed consideration in the EIR if they fail to meet most of the project objectives, are infeasible, or do not avoid any significant environmental effects (CEQA Guidelines, Section 15126.6(c)).

4.3.2 Alternative 1: No Project Alternative

Under the No Project Alternative, the recharge basins and pipeline would not be constructed and the project locations would remain undeveloped. JBWD would continue to rely exclusively on groundwater for its water supply. The Joshua Tree sub-basin would continue to be overdrafted each year as JBWD would be unable to take advantage of SWP water via the Morongo Basin Pipeline. Groundwater production from the basins is currently 1,600 afy. If growth continues at the expected rate, groundwater production would increase each year.

The No Project Alternative would not meet any of the project objectives as the existing supply is only 1,200 afy. As noted above, groundwater would continue to be overdrafted without the additional recharge capacity; JBWD would not be able to increase the reliability and quality of the water supply for their customers; nor would they be able to reduce demand on the local groundwater supply.

Under the No Project Alternative, the impacts identified that are associated with construction and operation of the proposed project would be avoided. However, under the No Project Alternative, the

potential improvement to groundwater supplies and quality, and groundwater recharge would not be realized because the proposed reduction in demand for groundwater would not be realized. Groundwater would remain the only source of potable water in the JBWD service area.

4.3.3 Alternative 2: Existing Demand Recharge Capacity

The Existing Demand Recharge Capacity Alternative is similar to the proposed project, except that the design of the recharge basin would be such that the recharge capacity would only meet the existing water supply demand of approximately 1,600 afy. The recharge basins are designed to accommodate large amounts of water to be received during a short time frame. Therefore, to allow a recharge capacity of 1,600 afy, the recharge basin under this alternative would be designed to accommodate approximately 3,200 afy. The area required for construction under the Existing Demand Recharge Capacity Alternative would be smaller than the 29 acres (22 wet acres) required under the proposed project. The proposed pipeline would still be installed as described in the proposed project.

The Existing Demand Recharge Capacity Alternative would meet most of the project objectives. This Alternative would provide additional groundwater recharge and storage in the JBWD service area and would allow for greater supply reliability and would reduce demand on local groundwater. It would also allow for storage during wet hydrologic periods and for use during dry periods. However, it would not allow for recovery of groundwater that has been overdrawn but never restored.

Overall, the Existing Demand Recharge Capacity Alternative would have fewer impacts for the proposed project. In addition, this alternative would not indirectly result in growth because it would not provide for a greater amount of water than what the current population uses.

4.3.4 Alternative 3: Increased Recharge Capacity

The Increased Recharge Capacity Alternative is similar to the proposed project, except there would be two to three recharge basins and/or one larger recharge basin constructed instead of one moderately sized recharge basin. Two or three of the recharge basins would be built as opposed to only one. This would allow for increased recharge as each basin has an estimated recharge capacity of approximately 4,000 afy. In addition, under the Increased Recharge Capacity Alternative, recharge could be increased by building larger groundwater basins with recharge capacities in excess of 4,000 afy. The proposed pipeline would be installed as described in the proposed project.

The Increased Recharge Capacity Alternative would meet all of the project objectives. The Increased Recharge Capacity Alternative would provide additional groundwater recharge, storage, and recovery capacity in the JBWD service area. This alternative would allow for greater supply reliability and would reduce demand on local groundwater. It would also allow for storage during wet hydrologic periods and for use during dry periods.

The Increased Recharge Capacity Alternative would have impacts that are discussed in more detail in the sections to follow. Some of the impacts would be magnified as compared to Alternative 3 as this alternative could indirectly result in growth because it would remove a barrier to growth, i.e., the increase in water supply would allow for a greater population than currently projected by the Joshua Tree Community Plan or the JBWD 2005 UWMP.

4.4 Summary of Alternatives Analysis

Table 4-1 compares the ability for the No Project Alternative and the Increase Recharge Capacity Alternative to meet the project objectives.

TABLE 4-1 – PROJECT ALTERNATIVE COMPARISON

Project Objectives	Proposed Project	No Project Alternative	Existing Demand Recharge Capacity Alternative	Increased Recharge Capacity Alternative
Provide additional groundwater recharge, storage, and recovery capacity in the Joshua Basin region	Yes	No	No	Yes
Allow the storage of water during wet hydrologic periods for recovery and use during dry periods, and to provide JBWD customers with increased water supply reliability	Yes	No	Yes	Yes
Reduce the demand for local groundwater	Yes	No	Yes	Yes
Enhance water supply reliability	Yes	No	Yes	Yes

4.5 Environmentally Superior Alternative

CEQA requires that an EIR identify the environmentally superior alternative of a project other than the No Project Alternative (CEQA Guidelines Section 15126.6(e)(2)).

Table 4-2 compares the environmental impacts of the No Project Alternative and the Increased Recharge Capacity Alternative relative to the proposed project.

The No Project Alternative would avoid all construction and operational impacts associated with the proposed project, including significant and unavoidable impacts on aesthetic resources, but the No Project Alternative would not meet any of the project objectives and would not include the beneficial impacts on hydrology and water supply.

The Existing Demand Recharge Capacity Alternative would meet most of the project alternatives. However, because recharge capacity would be capped at existing demand, this alternative would not allow for the replacement of water that has been extracted from the groundwater supply but has not been replaced because demand has exceeded the average annual recharge for many years. The Existing Demand Recharge Capacity Alternative would reduce some impacts related to construction of the proposed project, including impacts to air quality, and biological and cultural resources. However, this alternative would not reduce the significant and unavoidable impacts associated with aesthetic resources.

The Increased Recharge Capacity Alternative would meet all of the project objectives, but would not reduce any of the impacts associated with the proposed project, including the significant and unavoidable impacts related to aesthetics, and would result in increased impacts related to air quality, biological resources, cultural resources.

Overall, the Existing Demand Recharge Capacity Alternative is environmentally superior to the proposed project because, overall, it would result in fewer adverse environmental impacts and would include the beneficial hydrology and water supply impacts.

TABLE 4-2 – ENVIRONMENTAL IMPACT COMPARISON

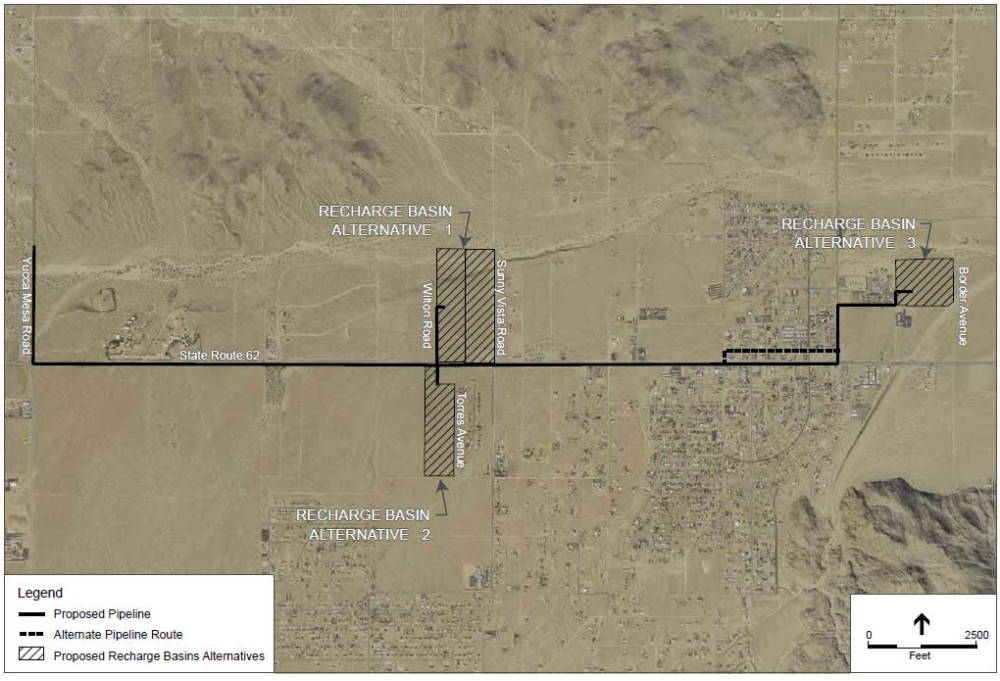
Parameter	Proposed Project	No Project Alternative	Existing Demand Recharge Capacity Alternative	Increased Recharge Capacity Alternative
Aesthetics	SU	-	=	=
Air Quality	LSM	-	-	+
Biological Resources	LSM	-	-	+
Cultural Resources	LSM	-	-	+
Geology, Soils, and Mineral Resources	LSM	-	=	=
Hazards and Hazardous Materials	LSM	-	=	=
Hydrology and Water Quality	LSM	+	=	=
Land Use, Agriculture, and Recreation	LSM	-	=	=
Noise	LTS	-	=	=
Public Services and Utilities	LTS	+	=	=
Traffic and Circulation	LSM	-	=	=

LTS = Less than significant impact LSM = Less than significant impact with mitigation SU = Significant and unavoidable impact NI = No Impact (—) = lesser impact (+) = greater impact (0) = no difference

4.6 RECHARGE BASIN LOCATIONS ANALYZED IN THE EIR

Three separate recharge basin locations were evaluated within the 2009 EIR for Project Alternatives 2 and 3, as shown on Figure 4-1.

FIGURE 4-1– ALTERNATIVE RECHARGE SITES



Recharge basin size requirements are based on a one-foot per day infiltration rate at each site. The proposed project would require a total area of 29 acres for basin construction, which would include 22 wet acres. The project would involve construction of multiple (up to six) six- to seven-foot deep subbasins within one of the recharge basin alternative locations. The subbasins would be separated by overflow earthen weirs, allowing water to flow from subbasin to subbasin as needed. The basins would fill by gravity and no pumping equipment would be needed. Control valves would be used to add water to the various subbasins, if necessary. These valves would be contained within a small building on the site.

Water levels within the basins would not exceed original grade elevation and would be maintained at depths of three to five feet. Annual average recharge is anticipated to be approximately 2,000 afy; however, with the availability of water being less than a full year, each site would be designed to allow the 2,000 af recharge with a 50 percent water delivery schedule. Therefore, the recharge basins would be able to accommodate a total capacity of up to approximately 4,000 af for half of the year in order to meet the goal of 2,000 afy of recharge.

A six-foot high earthen berm would surround the recharge basin to provide visual screening. The perimeter berms would not be used to impound water or provide freeboard. The recharge basin site would also be fenced with eight-foot chain-link fence.

Construction of the new recharge basin would require clearing and grubbing of the property. Site excavation and grading would be conducted to a depth of approximately six feet below grade. With a wetted area of 22 acres and six-foot deep basins, the project would result in approximately 200,000 cubic yards of earthwork. Approximately 25,000 cubic yards of the soil removed to create the basins would be used to form the perimeter berms. The remaining 175,000 cubic yards of earthwork would be disposed of or sold for re-use. Equipment needed for recharge basin construction would include bulldozers, excavators, scrapers, rollers, dump trucks, concrete trucks, pre-stressing equipment and construction delivery tractor-trailers.

4.6.1 Recharge Basin Location 1

Recharge Bain Location 1 is located on the north side of SR 62 west of Sunny Vista Road and includes a total area of 79.6 acres with a total useable area of 47.74 acres.

4.6.2 Recharge Basin Location 2

Recharge Bain Location 2 is located just south SR 62 west of Torres Avenue and includes a total area of 37.5 acres with a total useable area of 44.08 acres.

4.6.3 Recharge Basin Location 3

Recharge Bain Location 3 is the furthest east of the alternative sites and is located north of SR 62 and west of Border Avenue. Recharge Basin Location 3 includes a total area of 32.5 acres with a total useable area of 29.84 acres.

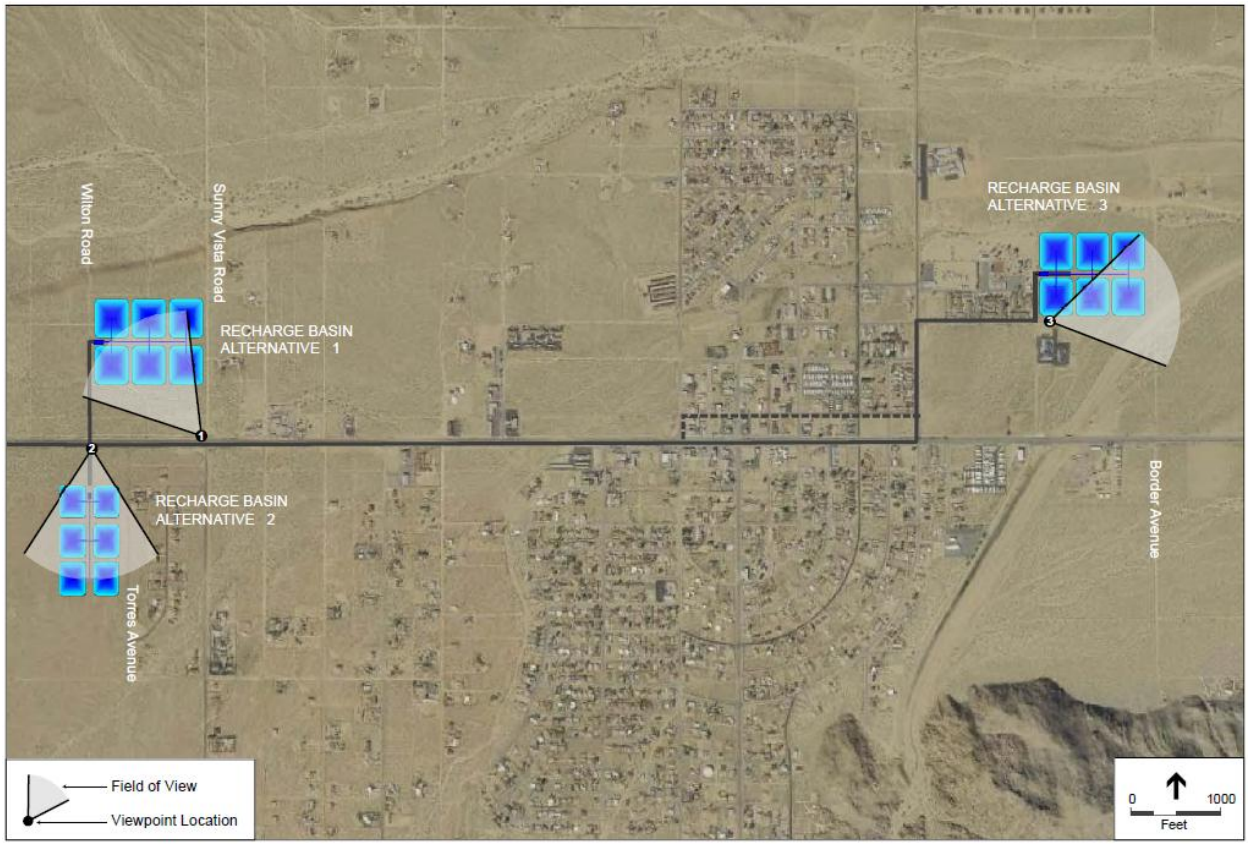
Recharge Basin Location 3 is the preferred alternative since it would result in fewer environmental impacts, including fewer impacts associated with aesthetic resources and biological resources.

5 ENVIRONMENT AND WATER QUALITY

In May 2009, JBWD commissioned a Draft Project-level Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA). The EIR purpose was to address specific alternatives proposed by JBWD to address reclamation and recharge requirements. JBWD conducted a detailed engineering feasibility analysis to identify a suite of potentially feasible facilities and operational scenarios for detailed consideration in the EIR. These facilities and operations were combined to form potential alternatives, out of which first three alternatives consisted of recharge basin location (Figure 5-1) and remaining three alternatives consisted of recharge capacity alternatives. The demand alternatives analyzed were:

- Alternative 1 – No Project Alternative
- Alternative 2 – Existing Demand Recharge Capacity
- Alternative 3 – Increased Recharge Capacity

FIGURE 5-1– ALTERNATIVE RECHARGE SITES



The EIR was completed and certified in September 2009, pursuant to the California Environmental Quality Act (CEQA) as amended (Public Resources Code Section 21000 et seq.) and CEQA Guidelines (California Administrative Code Section 15000 et seq.). Environmental findings were prepared for the EIR in accordance with Section 15091 of the CEQA Guidelines. The EIR was prepared to provide the public and responsible and trustee agencies information about the potential effects on the environment associated with the construction and operation of the JBWD proposed project.

In 2004, MWA prepared a Regional Water Management Plan (RWMP) and Program Environmental Impact Report (PEIR) that evaluated water supply and demand throughout the MWA service area including the JBWD service area. The proposed project was Includes in the MWA's RWMP as a moderate priority water supply enhancement project for JBWD. The RWMP evaluated alternatives and concluded that the proposed project would constitute the most appropriate means of providing water supply and storage to meet future JBWD service area demands.

Following are the objectives of the proposed project:

- Provide additional groundwater recharge, storage, and recovery capacity in the Joshua Basin region
- Allow the storage of water during wet hydrologic periods for recovery and use during dry periods, to provide JBWD customers with increased water supply reliability.
- Reduce the demand for local groundwater
- Enhance water supply reliability

Funding for projects submitted pursuant to Title XVI are administered by the Bureau of Reclamation (BOR) and subject to federal environmental regulations, including the Endangered Species Act (ESA), the National Historic Preservation Act (NHPA), and the General Conformity Rule for the Clean Air Act (CAA), among others. Each federal agency has their own policies as to how they comply with federal environmental laws – including National Environmental Policy Act (NEPA) regulations. For the JBWD proposed project, the 2009 EIR completed for the project pursuant to the California Environmental Quality Act (CEQA) will be incorporated by reference as the compliance base for the Title XVI Program application. In addition to the CEQA document, certain elements of NEPA are still required to meet federal environmental review regulations. This federal level review is added to the CEQA document (sometimes called CEQA Plus) and submitted as the complete environmental report to meet both state and federal requirements.

For the proposed project, , the 2009 EIR completed for the project pursuant to the California Environmental Quality Act (CEQA) will be incorporated by reference as the compliance base for the Title XVI Program application. In addition to the CEQA document, certain elements of NEPA are still required to meet federal environmental review regulations. This federal level review is added to the CEQA document (sometimes called CEQA Plus) and submitted as the complete environmental report to meet both state and federal requirements.

5.1 Potentially Significant Impacts

Because of the federal nexus and resulting NEPA requirements, the proposed project must be reviewed as to its potential environmental impacts relative to the federal Endangered Species Act (ESA) – biological concerns, National Historic Preservation Act (NHPA) – cultural resources, and Clean Air Act (CAA) – conformity determinations. In addition, an Environmental Justice (EJ) analysis and determination must be included. The following is a brief outline of the issues that will need to be addressed to meet NEPA requirements.

5.1.1 Biological

The ESA protects species which are officially listed as "endangered" or "threatened". A species can be listed in two ways. The U.S. Fish & Wildlife Service (USFWS) or the National Oceanographic & Atmospheric Administration (NOAA) Fisheries (also called the National Marine Fisheries Service) can directly list a species through its candidate assessment program, or an individual or organizational

petition may request that the USFWS or NMFS list a species. A "species" under the act can be a true taxonomic species, a subspecies, or in the case of vertebrates, a "distinct population segment".

Biological surveys have been completed for the project pursuant to the CEQA documents. The 2009 EIR established the existing conditions and provided an evaluation of potential impacts to biological resources associated with the proposed project.

A review of available background information including the proposed project layout, aerial photographs, and local soils survey, as well as a search and review of the current California Natural Diversity Database (CNDDB) within an approximate radius of five miles of the proposed project was conducted. The proposed project fall within the Joshua Basin North U.S. Geological Survey (USGS) 7.5 minute topological quadrangle map.

The CNDDB provided a list and mapped locations of special-status plant and wildlife species that have been recorded in the vicinity of the project site.

Among the various state listed species are several federally listed species, or candidate species, that may be affected by the project. The CNDDB search revealed the recorded occurrence of five special-status plant species within the file mile radius of the project site and fine wildlife species in the area that have the potential to occur on the project site recharge basin.

None of the plant species are listed as endangered or threatened by either the State of California or the federal government. Of the species designated as rare by the California Native Plant Society (CNPS), only little San Bernardino Mountains linanthus has a high probability of occurrence on any of the recharge basin alternative sites. Historical records were found for occurrence of this specie very close to Recharge Basin Alternatives 1 and 2. These include:

The five special status wildlife species in the area that have the potential to occus on the project site recharge basin alternatives are:

1. Burrowing Owl
2. Loggerhead Shrike
3. LeConte's Thrasher
4. Western Yellow Bat
5. Pallid San Diego Pocket Mouse

Though not included in the CNDDB, report from focus survey (Circle Mountain, 2008) indicated occurrence of a sixth sensitive wildlife species in the project vicinity, the desert tortoise. The desert tortoise is listed as a threatened species by both the State of California and federal government. The burrowing owl, loggerhead shrike and LeConte's thrasher have a moderate potential to occur at the proposed project sites.

Because the proposed project has the potential to significantly impact biological resources, JBWD proposes mitigation measures that would reduce the direct biological resources impacts of all facilities to a level that is less-than-significant. These mitigation measures are recommended in the 2009 EIR are presented in Table 5-1 below.

TABLE 5-1 – BIOLOGICAL MITIGATION MEASURES

Impact	Mitigation Measure
Special Status Species: Impact 3.3-1: Implementation of the proposed project could have a substantial adverse effect on listed, candidate or special-status ground dwelling wildlife species.	**Mitigation Measure 3.3-1a:** JBWD shall install a chain-link or tortoise fence (one-inch by two-inch welded wire mesh attached to the chin-link fence, with approximately two feet above ground and one foot buried below ground) to exclude small wildlife species from entering the active work areas. Exclusion fencing can be limited to areas of documented occurrences of special-status wildlife as determined during pre-construction surveys by a qualified biologist. **Mitigation Measure 3.3-1b:** JBWD shall conduct absence surveys for desert tortoise and pallid San Diego pocket mouse in all proposed disturbance areas that provide potential habitat. Surveys shall follow the USFWS protocol (USFWS, 1992) or other appropriate site-specific protocol as determined in coordination with USFWS. **Mitigation Measure 3.3-1c:** If USFWS-approved surveys do not identify desert tortoise or pallid San Diego pocket mouse within proposed disturbance areas, the following measures shall be implemented: • Prior to working on the project, all site managers and construction employees shall be educated as to the natural history, endangerment factors, and appropriate protocol for dealing with tortoise encountered in and around the construction areas. • In addition, if a tortoise is observed during construction, all construction shall be halted in the immediate area and the USFWS and CDFG must be immediately notified to determine necessary actions. **Mitigation Measure 3.3-1d:** If USFWS-approved surveys identify desert tortoise on any of the undeveloped lands to be cleared by JBWD, a Desert Tortoise Protection and Mitigation Plan shall be developed and adopted in consultation with the USFWS and CDFG. Elements of the plan shall include, but not be limited to the following: • Pre-construction desert tortoise surveys and tortoise relocation to an approved off-site location by a qualified biologist; • Staking of approved disturbance areas in the field and installation of temporary tortoise exclusion fencing around active construction areas; • A worker education program including the natural history, endangerment factors, and appropriate protocol for dealing with tortoise encountered in and around the construction areas; • Enforcement of speed limits and checking under vehicles for tortoise; • Biological monitoring of all ground disturbances; and • Measure to prevent increased use of the project site by common ravens through trash management, removal of unnatural sources of

	standing water, and other means. Compensatory mitigation for desert tortoise habitat loss shall be made available in perpetuity for the protection of the desert tortoise for the conversion of any potentially suitable habitat at a ratio determined in consultation with CDFG and USFWS. The location and conservation management of the identified compensatory lands shall be approved by USFWS pursuant to Sections 10a of the Federal ESA and by the CDFG pursuant to Section 2081 of the California Fish and Game Code.
Impact 3.3-2: Implementation of the proposed project could have a substantial adverse effect on listed, candidate or special-status bat and avian species.	**Mitigation Measure 3.3-2a:** Prior to any ground-disturbing activities, JBWD shall have a qualified Less than Significant. biologist conduct a pre-construction spring/summer active season reconnaissance survey for nesting/roosting special-status mobile bird and bat species, and other nesting birds within 300 feet (500 feet for raptors) of the construction limits of each project element to determine and map the location and extent of special-status species occurrence(s) that could be affected by the project. **Mitigation Measure 3.3-2b:** JBWD shall avoid direct impacts on any nesting birds located within the limits of construction. This could be accomplished by establishing the construction right of way and removal of plant material outside of the typical breeding season (February 1 through August 31). **Mitigation Measure 3.3-2c:** If construction and vegetation removal is proposed for the bird nesting period of February 1 through August 31, then pre-construction surveys for nesting/roosting bird and bats species shall begin 30 days prior to construction disturbance with subsequent weekly surveys, the last one being no more than three days prior to work initiation. The surveys shall include habitat within 300 feet (500 feet for raptors) of the construction limits. Active nest sites located during the pre-construction surveys shall be avoided and a non-disturbance buffer zone established dependent on the species and in consultation with the USFWS and CDFG. This buffer zone shall be delineated in the field with flagging, stakes or construction fencing. Nest sites shall be avoided with approved non-disturbance buffer zones until the adults and young are no longer reliant on the nest site for survival as determined by a qualified biologist. For species with high site fidelity, such as Swainson's hawk, if direct take of nests outside of the breeding seasons is required, JBWD shall contact CDFG to determine appropriate mitigation measures. **Mitigation Measure 3.3-2d:** If a natal bat roost site is located within the limits of construction during pre-construction surveys, it shall be avoided with non-disturbance buffer zone established by a qualified biologist in consultation with the USFWS and CDFG until the site is abandoned. **Mitigation Measure 3.3-2e:** JBWD shall stake, flag, fence, or otherwise clearly delineate the construction right-of-way that restricts the limits of construction to the minimum necessary to implement the project that also would avoid and minimize impacts on special-status avian and bat species. **Mitigation Measure 3.3-2f:** JBWD shall instruct construction personnel on the importance of buffer zones and sensitivity of the delineated areas.

	Mitigation Measure 3.3-2g: JBWD shall conduct a burrowing owl survey per the Burrowing Owl Survey Protocol and Mitigation Guidelines of the California Burrowing Owl Consortium (1993) or per the Staff Report on Burrowing Owl Mitigation prepared by CDFG (1995). At a minimum, this mitigation shall include the following: • A pre-construction survey shall be conducted by a qualified biologist within 30 days of the on-set of construction. This survey shall include two early morning surveys and two evening surveys to ensure that all owl pairs have been located. • If pre-construction surveys are undertaken during the breeding season (February 1st through July 31st) active nest burrows should be located within 250 feet of construction zones and an appropriate buffer around them (as determined by the project biologist) shall remain excluded from construction activities until the breeding season is over. • During the non-breeding season (August 15th through January 31st), resident owls may be relocated to alternative habitat. JBWD shall encourage owls to relocate from the construction disturbance area to off-site habitat areas and undisturbed areas of the project site through the use of one-way doors on burrows. If ground squirrel burrows, stand pipes, and other structures that have been documented during pre-construction surveys as supporting either a nesting burrowing owl pair or resident owl are removed to accommodate the proposed project, these structures and burrows shall be relocated or replaced on or adjacent to the project site. Relocated and replacement structures and burrows shall be sited within suitable foraging habitat within one half-mile of the project area. Suitable development-free buffers shall be maintained between replacement nest burrows and the nearest building, pathway, parking lot, or landscaping. The relocation of resident owls shall be in conformance with all necessary state and federal permits.
Impact 3.3-3: Implementation of the proposed project could have a substantial effect on special-status plant species.	**Mitigation Measure 3.3-3a:** JBWD shall have a qualified biologist conduct a pre-construction spring/summer floristic inventory and rare plant survey of the proposed project areas in accordance with CDFG's Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities, (revised May 8, 2000) to determine and map the location and extent of special-status plant species populations within the construction right-of-way. The survey shall be conducted during the appropriate flowering time for target plant species. **Mitigation Measure 3.3-3b:** If not possible to avoid, JBWD shall minimize impacts on special-status plant species by reducing the construction right-of-way through areas with potential occurrences of special-status plant species. For unavoidable direct impacts to special-status species, consultation with CDFG shall be required to determine the impact area and further mitigation, which could include acquisition of habitat of equal or superior value at a ratio of at least 2:1.

	Mitigation Measure 3.3-3c: JBWD shall stake, flag, fence, or otherwise clearly delineate the construction right-of-way that restricts the limits of construction to the minimum necessary to implement the project that would also avoid and minimize impacts on special-status plant species. **Mitigation Measure 3.3-3d:** Earth-moving equipment will avoid maneuvering in areas outside the identified limits of construction in order to avoid disturbing open space areas that will remain undeveloped. Prior to construction, the natural open space limits will be marked by the construction supervisor and a qualified biologist. These limits will be identified on the construction drawings. JBWD shall submit a letter to the appropriate agencies verifying that construction limits have been flagged and clearly delineated in the field. No earth-moving equipment will be allowed outside demarcated construction zones.
Natural Communities of Special Concern / Local Policies and Ordinances: Impact 3.3-4: The proposed project could conflict with local policies and ordinances protecting biological resources, such as Joshua trees.	**Mitigation Measure 3.3-4a:** Prior to the commencement of ground disturbance activities for any Less than Significant. component of the proposed project, a qualified biologist/arborist shall provide an inventory of the number and size of Joshua trees to be removed. **Mitigation Measure 3.3-4b:** JBWD shall apply for and receive a permit from the County of San Bernardino prior to removal of native vegetation protected under San Bernardino County Development Code Section 88.01 and shall transplant or stockpile Joshua trees as required under the conditions of the permit.

Note: Refer to the 2009 EIR for details regarding Impact and Mitigation Measure number in the Table 5-1 above.

5.1.2 Cultural

Section 106 of the NHPA requires federal agencies to take into account effects on historic properties caused by federal actions (such as funding/implementing Title XVI projects) and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings through consultation with the State Historic Preservation Officer (SHPO) and with interested Indian Tribes and individuals. Cultural resources are defined as prehistoric and historic sites, structures, and districts, or any other physical evidence associated with human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious or any other reason. . For analysis purposes, cultural resources may be categorized into three groups:

1. Archaeological Resources,
2. Historic Resources, and
3. Contemporary Native American Resources.

Also, it should be determine that all original maps and studies have been submitted for consultation with SHPO.

During the CEQA process, intensive archaeological surveys were performed for much of the proposed project locations. All potentially significant cultural resources were identified and documented. Results of the surveys have been transmitted to the Native American Heritage Commission. As a result of the

surveys, no known sacred sites have been identified in the immediate project areas. Nevertheless, the BOR will be required to coordinate with the SHPO and seek concurrence on compliance with Section 106 of the NHPA.

JBWD will implement the following mitigation measures to reduce impacts to a level that is less-than-significant. These mitigation measures are recommended in the 2009 EIR and are presented in Table 5-2 below.

TABLE 5-2 – CULTURAL MITIGATION MEASURES

Impact	Mitigation Measure
Archeological and Historical Resources: Impact 3.4-1: Project construction could adversely affect known or unknown cultural resources, including unique archaeological resources and historic resources.	**Mitigation Measure 3.4-1a: Avoidance of cultural resources.** JBWD shall avoid all cultural resources where feasible. Prior to construction, a qualified archaeologist (defined as an archaeologist meeting the Secretary of the Interior's Standards for professional archaeology) shall mark exclusion zones around known archaeological sites that exist near the construction areas but that can be avoided to ensure they are not impacted by construction. **Mitigation Measure 3.4-1b: Evaluation of cultural resources if avoidance is not feasible.** If avoidance is not feasible, prior to any ground disturbing activity, known cultural resources that cannot be avoided shall be evaluated further by a qualified archaeologist to determine the resources' eligibility to the California Register or local historic register and potential significance under CEQA. This can be accomplished by implementing extended Phase I archaeological testing, which would involve relocating the resources, thoroughly documenting them, and conducting limited subsurface testing to obtain more data. Any archaeological testing should be carried out by an archaeologist meeting the Secretary of the Interior's Standards for professional archaeology. If, after extended Phase I archaeological testing, a resource is determined to be eligible to the California Register or local historic register, a site treatment plan or additional protection measures will be developed. If the site evaluation results in an assessment that a resource is not eligible, no further work or protective measures will be necessary. **Mitigation Measure 3.4-1c: Monitoring by a qualified archaeologist and Native American representative during ground disturbing activities.** JBWD shall retain a qualified archaeological monitor for ground-disturbing activities, including brush clearance and grubbing as necessary to identify the presence of potential resources as determined by the qualified archaeologist. In the event that cultural resources are unearthed during ground-disturbing activities, the archaeological monitor shall be empowered to halt or redirect ground-disturbing activities away from the vicinity of the find so that the find can be evaluated. Due to the sensitivity of the project area for Native American resources, at least one Native American monitor shall also monitor ground-disturbing activities in the project area necessary to identify presence of potential resources as determined by a qualified Native American monitor. Selection of monitors shall be made by agreement of the Native American groups identified by the Native American Heritage Commission as having affiliation with the project area.

	Mitigation Measure 3.4-1d: Cease Work if Prehistoric, Historic or Paleontological Subsurface Cultural Resources are Discovered During Ground-Disturbing Activities. If cultural resources are encountered, excavation activity in the vicinity of the find shall cease until it can be evaluated by the archaeological monitor. If the archaeological monitor determines that the resources may be significant, the archaeological monitor will notify the lead agency and will develop an appropriate treatment plan for the resources. The archaeologist shall consult with Native American monitors or other appropriate Native American representatives in determining appropriate treatment for unearthed cultural resources if the resources are prehistoric or Native American in nature. In considering any suggested mitigation proposed by the archaeologist in order to mitigate impacts to cultural resources, the project proponent will determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) will be instituted. Work may proceed on other parts of the project site while mitigation for cultural resources is being carried out.
Paleontological Resources: Impact 3.4-2: Implementation of the proposed project could adversely affect paleontological resources.	**Mitigation Measure 3.4-2: Accidental discovery of paleontological resources.** If paleontological resources are encountered during the course of construction and monitoring, JBWD shall halt or divert work and notify a qualified paleontologist who shall document the discovery as needed, evaluate the potential resource, assess the significance of the find, and develop an appropriate treatment plan in consultation with JBWD.
Human Remains: Impact 3.4-3: Implementation of the proposed project could result in the disturbance of human remains.	**Mitigation Measure 3.4-3:** Halt Work if Human Skeletal Remains are Identified During Construction. If human skeletal remains are uncovered during project construction, the project proponent (depending upon the project component) will immediately halt work, contact the San Bernardino County coroner to evaluate the remains, and follow the procedures and protocols set forth in Section 15064.5 (e)(1) of the CEQA Guidelines. If the County coroner determines that the remains are Native American, the project proponent will contact the NAHC, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by AB 2641). Per Public Resources Code 5097.98, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section (PRC 5097.98), with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains.

5.1.3 Health and Safety

The proposed project has the potential to significantly impact public health and safety through construction-related excavations, potential fuel and lubricant spills during construction and temporary interference of emergency response services during construction. With the implementation of the following mitigation measures, impacts would be reduced to a level that is less-than-significant.

Section 25501 (o) of the California Health and Safety Code defines "hazardous material" as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material that would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

The Community of Joshua Tree is a small area of commercial and residential development surrounded by open space. The Yucca Valley Airport lies approximately 2.5 miles west of Yucca Mesa Road and SR 62. Roy Williams Airport is approximately 5.5 miles north-east of Park Boulevard and SR 62. Twentynine Palms Airport is greater than 15 miles north-east of the project site.

There are approximately nine schools located within 10 miles of the proposed project (Morongo Unified School District, 2008). One of these schools, the Friendly Hills Elementary School, is within a quarter mile of Alternative Recharge Basin 1.

The County of San Bernardino Fire Hazard Overlay Maps identify fire hazard zones within the community of Joshua Tree and the California Department of Fire and Forestry maps the Fire Hazard Severity Zones (FHSZ) within the County of San Bernardino. The FHSZ's are based on an evaluation of fuels, topography, dwelling density, weather, infrastructure, building materials, brush clearance, and fire history. According to these maps, the majority of the project site is located in areas designated as having a 'moderate fire hazard' (County of San Bernardino, 2007a). However, fire hazard severity has been mapped as very high in areas near the proposed pipeline extension at the intersection of SR 62 and Sunset Avenue (County of San Bernardino, 2007a).

A database search was conducted to identify the hazardous materials/waste sites present in the project vicinity. The purpose of this inquiry was to identify portions of the project site that may have contaminated soils. Potential sites of contaminated soils within the project vicinity were identified with a review of the following databases:

Leaking Underground Storage Tank (LUST) databases: Identifies potential sources of soil contamination by petroleum hydrocarbons and petroleum-related volatile organic compounds (VOCs).1

Envirostor databases: The California Department of Toxic Substances Control's (CDTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP) EnviroStor database identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.2

The federal Occupational Safety and Health Administration (OSHA) enforces regulations covering the handling of hazardous materials in the workplace. The regulations established in the Code of Federal Regulations (CFR) Title 29 are designed to protect workers from hazards associated with encountering hazardous materials at the work site. The regulations require certain training, operating procedures, and protective equipment to be used at work sites that could encounter hazardous materials. All three proposed project alternative sites are vacant, undeveloped lots and do not contain any hazardous materials.

The following is a discussion of the potential effects of the proposed project to Hazards and Hazardous Materials according to the key issue areas identified in the CEQA Guidelines.

Transport, Use or Disposal of Hazardous Materials

The proposed project would not create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials. Construction activities would result in limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, hydraulic fluids, paint, and other similarly related materials brought onto the project site, used, Hazardous Materials Site Lists

The proposed project is not located on a hazardous materials site identified in the LUST, Cortese, Envirostor, or SWLF databases. Therefore, the project would not create a significant hazard to the public or the environment and no impacts related to this issue would occur.

Public Airport or Private Airstrip

The proposed project is not located in the vicinity of an airport or private airstrip. Therefore, the project would not need to adhere to an airport land use plan and would not present a safety hazard to people residing or working in the project area. No hazard impacts related to proximity to an airport or private airstrip would occur.

Emergency Response Plan

Construction activities could impede access for emergency response vehicles, which could interfere with an emergency response plan or emergency evacuation plan. Measures to avoid interference with emergency access would be mitigated to less-than-significant levels through the creation of a Traffic Control Plan.

JBWD will implement the following mitigation measures related to accidental upsets, schools, wildland fires, and vector control to reduce impacts to a level that is less-than-significant. These mitigation measures are recommended in the 2009 EIR and are presented in Table 5-3 below.

TABLE 5-3 – HEALTH AND SAFETY MITIGATION MEASURES

Impact	Mitigation Measure
Accidental Upset: Impact 3.6-1: Accidental upset of hazardous materials used during project construction may increase the risk of exposure to the environment, workers, and the public.	**Mitigation Measure 3.6-1:** Construction contractor(s) shall be required to implement best management practices (BMPs) for handling hazardous materials during the project. The use of the construction BMPs shall minimize negative effects on groundwater and soils, and will include, without limitation, the following: • Follow manufacturers' recommendations and regulatory requirements for use, storage, and disposal of chemical products and hazardous materials used in construction; • Avoid overtopping construction equipment fuel tanks; • During routing maintenance of construction equipment, properly contain and remove grease and oils; and • Properly dispose of discarded containers of fuels and other

	chemicals.
Schools: Impact 3.6-2: The proposed project will handle hazardous materials within one-quarter mile of the Friendly Hills Elementary School.	Implement Mitigation Measure 3.6-1
Wildland Fires: Impact 3.6-3: Construction activities in the vicinity of SR 62 and Sunset Avenue would have the potential to expose people or equipment to risk of loss, injury, or death involving wildland fires.	**Mitigation Measure 3.6-3a:** JBWD shall coordinate with local fire agencies to develop a fire safety plan, which describes various potential scenarios and action plans in the event of a fire. **Mitigation Measure 3.6-3b:** During construction, all staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other material that could ignite. Any construction equipment that includes a spark arrestor shall be equipped with a spark arrestor in good working order. Construction crews shall have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks.
Vector Control: Impact 3.6-4: Operation of the project would create standing water for periods of time that could promote vector generation including mosquitoes.	None Required.

5.1.4 Regulated Waters of the United States

Several drainage features are present within and near the three proposed project recharge basin alternatives; however, none of the drainage features found on the recharge basin alternative sites or crossed by the proposed pipeline meet the definition of Waters of the U.S. or federal wetlands under the jurisdiction of the USACE. The washes are relatively small and characterized by infrequent, flashy, short duration flows. They are non-navigable and are not tributaries to any navigable waters. Coyote Lake, the receiving water body, is not a navigable water and the washes do not abut or flow into any other navigable waters. None of the drainage features present on the project recharge basin alternative sites meet the definition for regulated Waters of the U.S.

Recharge Basin Alternative 1

Two drainage features cross Recharge Basin Alternative 1 (Figure 5-2). At the northern end of the site, the current extent of a braided wash was mapped bank to bank. This wash is part of a system of small washes that drain to the east and join to form a named wash, Yucca Creek, to the east of the Recharge Basin Alternative 1. Vegetation in the wash area is characterized as Mojave Desert Wash Scrub and is dominated by catclaw (Acacia greggii). Other species present include: desert willow (Chilopsis linearis), and desert tea (Ephedra californica). This wash occupies 2.63 acres across the northern end of Recharge Basin Alternative 1.

A smaller wash crosses the southern third of Recharge Basin Alternative 1. This wash drains to the east, following SR 62 for approximately 1.5 miles before joining with the named wash, Joshua Creek, near Border Road. Vegetation in this wash is also characterized as Mojave Desert Wash Scrub. Plant species present included catclaw, desert tea, coyote melon (Cucurbita palmata) and desert senna (Senna

armata). This wash occupies 0.67 acres across the southern third of the Recharge Basin Alternative 1, for a total of 3.30 acres within Recharge Basin Alternative 1.

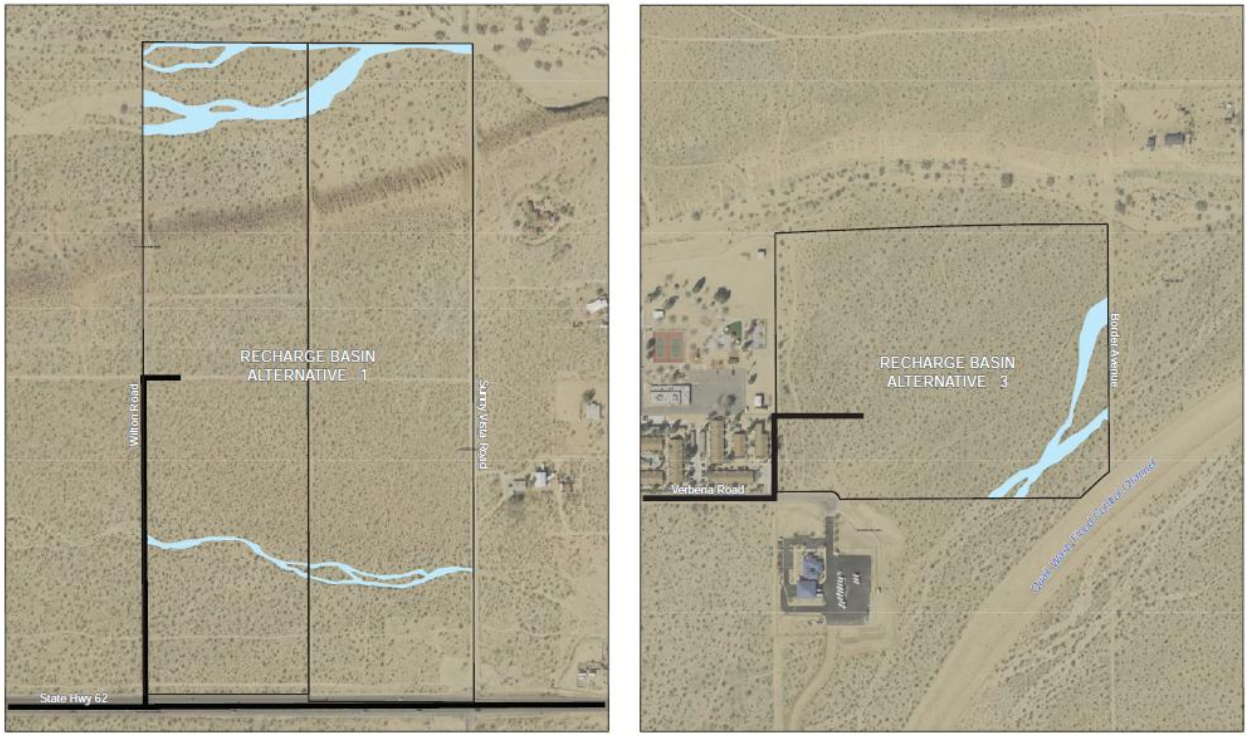
Recharge Basin Alternative 2

This recharge basin alternative does not contain any streams, drainage features, washes, wetlands or other areas of jurisdictional concern.

Recharge Basin Alternative 3

A small un-named wash crosses the southeast corner of Recharge Basin Alternative 3 (Figure 5-2). The wash flows to the east and joins with Joshua Creek. The wash does not contain any special vegetation that differentiates it from the surrounding habitat of Mojavean Creosote Bush Scrub, however, a discernable bed and bank are present and measures a total area of 1.16 acres.

FIGURE 5-2 – DRAINAGE FEATURES



Pipelines

The pipeline feeding the recharge basins will be constructed parallel to roadways and potentially cross up to eight small desert washes depending on the recharge basin alternative selected. All of these washes are part of a drainage system that terminates at Coyote Lake. They are relatively small, and characterized by infrequent, flashy, short duration flows. The washes vary in width from six to 10 feet.

5.2 Required Environmental Compliance Measures

5.2.1 NEPA

For the proposed project, the 2009 EIR completed for the project pursuant to the California Environmental Quality Act (CEQA) will be incorporated by reference as the compliance base for the Title XVI Program application.

5.2.2 Executive Orders

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations". As such, an Environmental Justice evaluation is required for any federal actions were NEPA is also required. The Council on Environmental Quality (CEQ) has oversight of the Federal government's compliance with Executive Order 12898 and NEPA.

5.2.3 Endangered Species Act

The Endangered Species Act (ESA) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The law requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or the U.S. National Oceanic and Atmospheric Administration Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species.

Federal Endangered Species Act

The United States Fish and Wildlife Service (USFWS) administers the federal Endangered Species Act (FESA) that provides a process for listing species as either threatened or endangered, and methods of protecting listed species. Species are listed as either endangered or threatened under Section 4 of the FESA that defines as "endangered" any plant or animal species that is in danger of extinction throughout all or a significant portion of its range and "threatened" if a species is likely to become endangered in the foreseeable future. Section 9 of the FESA prohibits "take" of listed 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. Harm under the definition of "take" includes disturbance or loss of habitats used by a threatened or endangered species during any portion of its life history. Under the regulations of the FESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act.

California Endangered Species Act

The California Endangered Species Act (CESA) is similar to the main provisions of the FESA and is administered by the California Department of Fish and Game (CDFG). Unlike its federal counterpart, CESA applies the take prohibitions to not only listed threatened and endangered species, but also to state candidate species for listing. Section 86 of the Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The CDFG maintains lists for Candidate-Endangered Species and Candidate-Threatened Species, which have the same protection as listed species. Under CESA, the term "endangered species" is defined as a species of plant, fish, or wildlife, which is "in serious danger of becoming extinct throughout all, or a significant portion of its range" and is limited to species or subspecies native to California.

The Endangered Species Act (ESA) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The law requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or the U.S. National Oceanic and Atmospheric Administration Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species.

JBWD will comply with the Endangered Species Act through a complete evaluation of the affects of the proposed project on federal species and through informal consultation with the USFWS as needed.

5.2.4 Clean Water Act

Wetlands are generally considered to be areas that are periodically or permanently inundated by surface or ground water, and support vegetation adapted to life in saturated soil. Wetlands are recognized as important features on a regional and national level due to their high inherent value to fish and wildlife, use as storage areas for storm and floodwaters, and water recharge, filtration, and purification functions. Technical standards for delineating wetlands have been developed by the U.S. Army Corps of Engineers (USACE), which generally define wetlands through consideration of three criteria: hydrology, soils, and vegetation. Under Section 404 of the Clean Water Act (CWA), USACE is responsible for regulating the discharge of dredged or fill material into waters of the United States. The term "waters" includes wetlands and non-wetland bodies of water that meet specific criteria as defined in the Code of Federal Regulations.

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The CWA makes it unlawful to discharge any pollutant from a point source into navigable waters of the U.S. unless a permit was obtained.

5.2.5 National Historic Preservation Act

Section 106 of the NHPA requires federal agencies to take into account effects on historic properties caused by federal actions (such as funding/implementing Title XVI projects) and to provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings through consultation with the State Historic Preservation Officer (SHPO) and with interested Indian Tribes and individuals. The BOR will coordinate with the SHPO and seek concurrence on compliance of Section 106 of the Act.

6 LEGAL AND INSTITUTIONAL REQUIREMENTS

6.1 WATER RIGHT ISSUES

There are no significant water rights issues anticipated to preclude implementation of the JBWD's proposed Project.

The water to be used for the recharge of the groundwater basin will be supplied from the SWP. JBWD has an existing contract with the California Department of Water and Resources (DWR) to take delivery of up to 1,959 acre-feet of State Water Project water per year. The existing California Aqueduct and existing MWA facilities allow SWP water to be brought to the project area to serve the project needs. JBWD's contract for the SWP water and JBWD's charter and other stated obligations allow and/or require it to use this supplemental water for groundwater recharge for overdraft replenishment and reclamation. See Section 8.2 below for a further discussion on JBWD's SWP water contract.

Overdraft in the basin allows available capacity in the basin to be used for SWP water storage through recharge. The amount of water extracted from the basin through project implementation will not be greater than the amount of SWP water recharged into the basin. At some future time, after the imported SWP water is recharged into the underlying aquifer, the stored (or banked) water will be recovered from the groundwater basin and delivered to its customers, and as appropriate, blended with other groundwater sources to reclaim naturally impaired groundwaters, as well as help offset salt loading associated with future recycled water supplies.

Table 6-1 presents a preliminary list of the agencies and entities in addition to JBWD that would use this EIR in their consideration of specific permits and other discretionary approvals that may apply to the project. This EIR is intended to provide these agencies with information to support the agency decision-making processes. The table also lists the types of activities that would be subject to these requirements.

TABLE 6-1 – AGENCIES AND PERMITING REQUIREMENTS

Agency	Permits and Authorizations	Required Activities Subject to Regulations
California Department of Fish and Game	1602 Lake and Streambed Alteration Agreement	Fish and Game Code Section 1602 applies to projects impacting perennial, intermittent, and ephemeral rivers, streams, and lakes in the state.
Regional Water Quality Control Board	Waste Discharge Requirements	Placement of dredge or fill materials into waters of the state.
California Department of Transportation (Caltrans)	Storm Water Pollution Prevention Plan Encroachment permit	Construction access within SR 62 right of way
San Bernardino County	Encroachment Permit	Construction access within the community of Joshua Tree roadways.

6.2 Legal and Institutional Requirements

6.2.1 Joshua Basin Water District

JBWD was formed as a public agency in 1963, when the District purchased and combined several smaller existing water systems. Since that time, JBWD has grown to serve more than 5,500 connections within its 96-square mile service area, between Yucca Valley, Twentynine Palms, Joshua Tree National Park and the Twentynine Palms Marine Corps Base.

6.2.2 JBWD Regional Water Management Plan and Environmental Compliance

In 2004, MWA prepared a Regional Water Management Plan (RWMP) and Program Environmental Impact Report (PEIR) that evaluated water supply and demand throughout the MWA service area including the JBWD service area. The proposed project was Includes in the MWA's RWMP as a moderate priority water supply enhancement project for JBWD. The RWMP evaluated alternatives and concluded that the proposed project would constitute the most appropriate means of providing water supply and storage to meet future JBWD service area demands.

Following are the objectives of the proposed project:

- Provide additional groundwater recharge, storage, and recovery capacity in the Joshua Basin region
- Allow the storage of water during wet hydrologic periods for recovery and use during dry periods, to provide JBWD customers with increased water supply reliability.
- Reduce the demand for local groundwater
- Enhance water supply reliability

In May 2009, JBWD commissioned a Draft Project-level Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA). The EIR purpose was to address specific alternatives proposed by JBWD to address reclamation and recharge requirements. JBWD conducted a detailed engineering feasibility analysis to identify a suite of potentially feasible facilities and operational scenarios for detailed consideration in the EIR.

The EIR was completed and certified in September 2009, pursuant to the California Environmental Quality Act (CEQA) as amended (Public Resources Code Section 21000 et seq.) and CEQA Guidelines (California Administrative Code Section 15000 et seq.). Environmental findings were prepared for the EIR in accordance with Section 15091 of the CEQA Guidelines. The EIR was prepared to provide the public and responsible and trustee agencies information about the potential effects on the environment associated with the construction and operation of the JBWD proposed project.

6.2.3 Joshua Basin Water District Basin Adjudication

The basins are not adjunct, therefore this section is not application.

6.2.4 JBWD and State Water Project

JBWD is responsible for the overall management of the groundwater resources pursuant to the Joshua Basin Water District AB3030 Groundwater Management Plan. JBWD has the authority to initiate regional water supply and groundwater recharge projects to replenish its depleting groundwater.

JBWD is entitled to receive SWP water through cost participation with the Mojave Water Agency (MWA) Morongo Basin Pipeline Project. MWA is a SWP contractor that serves an area of 4,900 square miles of the high desert region of Southern California. In January 1995, the MWA completed construction of a 71-mile pipeline to deliver SWP water to the communities served by the Hi-Desert Water District, Bighorn-Desert View Water Agency, San Bernardino County Service Area 70, and JBWD. This construction project included an agreement between JBWD and MWA, which entitled JBWD to an annual volume of 1,959 afy of SWP water until 2022 and provided a stub-out at JBWD boundary for future extension of the MWA pipeline.

6.2.5 Regional Water Quality Control Board and Water Quality

The California Regional Water Quality Control Board Lahontan Region provides regulatory control over the recharge operations of the proposed project.

Nine (9) Regional Boards have the responsibility for protecting water quality in California. Each Regional Board regulates discharges to surface waters under the Federal CWA and the California Porter-Cologne Water Quality Control Act. The Regional Boards' Jurisdiction extends to all waters of the State (including SWANCC and Rapanos conditions) and to all WoUS (including wetlands).

Section 401 of the CWA gives the Regional Board the authority to regulate through 401 Certification any proposed federally permitted activity that may affect water quality. Among such activities are discharges of dredged or fill material permitted by the Corps pursuant to Section 404 of the CWA Section 401 requires the Regional Board to provide "certification that there is reasonable assurance that an activity which may result in the discharge to waters of the United States will not violate water quality standards". Water quality certification must be based on a finding that the proposed discharge will comply with water quality standards, which are found as numeric and narrative objectives in each of the Regional Boards Basin Plans.

7 RENEWABLE ENERGY AND ENERGY EFFICIENCY

The proposed project is designed to be a gravity flow system for recharging the groundwater basin. There are not any renewable energy and energy efficiency requirements for the proposed project.

8 WATERSHED PROSPECTIVE

Situated above the Copper Mountain and Joshua Tree groundwater basins in the Morongo area, the District's sole source of water is the groundwater that is pumped from these basins. These groundwater basins contain over 600,000 acre-feet (af) of water.

JBWD is responsible for the overall management of the groundwater resources pursuant to the Joshua Basin Water District AB3030 Groundwater Management Plan. JBWD has the authority to initiate regional water supply and groundwater recharge projects to replenish its depleting groundwater.

In 2004, MWA prepared a Regional Water Management Plan (RWMP) and Program Environmental Impact Report (PEIR) that evaluated water supply and demand throughout the MWA service area including the JBWD service area. The proposed project was Includes in the MWA's RWMP as a moderate priority water supply enhancement project for JBWD. The RWMP evaluated alternatives and concluded that the proposed project would constitute the most appropriate means of providing water supply and storage to meet future JBWD service area demands.

Following are the objectives of the proposed project:

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- Reduce the demand for local groundwater
- Enhance water supply reliability

Well Completion Report

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. xxxxxxx

Page _____ of _____

Owner's Well Number _____

Date Work Began _____ Date Work Ended _____

Local Permit Agency _____

Permit Number _____ Permit Date _____

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N Latitude W Longitude

APN/TRS/Other

Geologic Log

Orientation ○ Vertical ○ Horizontal ○ Angle Specify _____

Drilling Method _____ Drilling Fluid _____

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc

Total Depth of Boring _____ Feet

Total Depth of Completed Well _____ Feet

Well Owner

Name _____

Mailing Address _____

City _____ State _____ Zip _____

Well Location

Address _____

City _____ County _____

Latitude _____ Deg. _____ Min. _____ Sec. N Longitude _____ Deg. _____ Min. _____ Sec. W

Datum _____ Decimal Lat. _____ Decimal Long. _____

APN Book _____ Page _____ Parcel _____

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

○ New Well
○ Modification/Repair
  ○ Deepen
  ○ Other _____
○ Destroy
  Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

○ Water Supply
  ☐ Domestic ☐ Public
  ☐ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)

Depth to Static Water Level _____ (Feet) Date Measured _____

Estimated Yield * _____ (GPM) Test Type _____

Test Length _____ (Hours) Total Drawdown _____ (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet	to Feet	Fill	Description

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☐ Other _____

Attach additional information, if it exists.

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name _____
Person, Firm or Corporation

_____ Address _____ City CA State _____ Zip

Signed _____ C-57 Licensed Water Well Contractor _____ Date Signed _____ C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

INTENTIONALLY LEFT BLANK