

## Section 2.5 Mojave River (5 of 5 Focus Watersheds)

### 2.5a Watershed Overview

The Mojave Watershed encompasses approximately 4,500 square miles and is located entirely within San Bernardino County (see Figure 2.5 -1). Total population in the watershed is increasing every year and is expected to grow to nearly one-half million by the year 2015. Much of the existing and projected future population is concentrated in the Victor Valley, which includes the incorporated cities of Victorville, Hesperia, Apple Valley, and Adelanto.

The primary geographic and hydrologic feature of the watershed is the Mojave River. The headwaters of the Mojave River are in the San Bernardino Mountains, which annually receives greater than 40 inches of precipitation at its highest elevations. Much of the winter precipitation in the San Bernardino Mountains falls in the form of snow that provides spring recharge to the Mojave River system. Historically, the annual recharge from the headwaters is approximately 75,000 acre-feet. The Mojave River channel, through both surface and subsurface flow, transects the watershed a linear distance of approximately 120 miles to its terminus at Silver Dry Lake near the Community of Baker. Aside from intense storm events, the Mojave River channel is typically dry downstream of the Mojave Forks Dam except in select locations where ground water is forced to the surface by geologic structures.

The Mojave River has been selected as a priority or “focus” watershed because of numerous water quality and quantity issues. Historically known for its agricultural, industrial and military land uses, the Victor Valley has significantly changed during the last several decades into a satellite of Southern California’s urbanization. Urban growth has significantly modified the arena of waste discharges that could potentially affect water quality, including stormwater and wastewater treatment. There are also numerous water quality issues associated with past and current agricultural, industrial, and military land uses throughout the watershed. Because of water quality degradation associated with past industrial activities, some waters in the Mojave River watershed are listed as a water quality limited segment for priority organics on the federal Section 303(d) list of impaired water bodies.

Typical of southwestern arid environments, the Mojave Watershed has limited water resources. Surface water from the headwaters in the San Bernardino Mountains quickly percolates into the porous sands of the young Mojave River alluvium. Thus, ground water is the primary source of water supply in most of the watershed. In a constant state of overdraft since the 1950’s, the ground water resources of the Mojave Watershed were formally adjudicated in 1996 through a stipulated judgment. The stipulated judgment was appealed shortly thereafter. The California Supreme Court issued a decision in the case on August 22, 2000 that affirmed water rights priority in cases of competing water apportionment.

### 2.5b Water Quality Issues and Problems

#### *Water Quality Planning*

Water Quality Standards -- In the early 1970’s the RWQCB evaluated existing surface water quality data for the Mojave Watershed. The majority of these data had been collected by the California Department of Water Resources (DWR) and the United States Geological Survey (USGS), and includes data from the turn of the 20th century. Based on these data, the RWQCB adopted numerical water quality objectives (WQOs) for inorganic constituents in surface waters of the Mojave River and several of its tributaries in the San Bernardino Mountains. These numerical standards generally represented native or “background” water quality.

Insert Figure 2.5-1

Map of Watershed

In the early 1980's, the RWQCB adopted numerical WQOs for ground waters of the Mojave River. These numerical WQOs apply to "reaches of the Mojave River which flow underground in a confined channel", and were developed based upon available ground water data collected by the DWR and the USGS from wells within approximately one-half mile of the Mojave River. Since adoption of these WQOs, there have been numerous changes in the watershed that can affect water quality. These changes include urbanization, overdraft conditions, improved wastewater treatment technologies, regionalization of wastewater treatment, importation of water from California's aqueduct system, dairy land uses, reduction in crop production, and improved industrial waste handling procedures. Furthermore, the RWQCB has more current knowledge regarding the hydrogeology and hydrochemistry of the Mojave River system. These numerous changes, and projected future changes such as further urban growth, warrant a careful evaluation of the RWQCB's WQOs. The evaluation of these objectives will be a long-term process that will require involvement of numerous stakeholders.

For the purpose of evaluating the WQOs, the RWQCB has assembled two groups of stakeholders. The first group is focused on surface water upstream of the Mojave Forks Dam, which is located near the City of Hesperia. The second group is focused on the ground waters of the Mojave River flood plain aquifer downstream of the Mojave Forks Dam, and the few downstream locations where ground water is forced to the surface of the Mojave River flood plain by geologic structures. The overall goal of the sampling effort is to compare existing surface water quality to the WQOs that were developed in the 1970's. The goals and objectives of these stakeholder groups are defined in more detail under Section 2.5(c) of this chapter.

Water Quality Objectives in the Barstow Area -- Historic discharges of industrial, commercial, and domestic wastewater degraded ground water quality in the Barstow area. Degradation of ground water quality is from several constituents of concern, including petroleum hydrocarbons, phenols, methylene blue active substances (MBAS), and total dissolved solids. Several domestic wells were impacted, and their use was discontinued. Because of this documented ground water degradation, the Mojave River has been listed as a water quality limited segment on the federal 303(d) list of impaired water bodies. The location and sampling methods for the Barstow area will be evaluated as part of the overall evaluation of water quality standards. In January 2001, the Regional Board adopted changes to the 303(d) list that recommended removing the Mojave River from the list of impaired water bodies.

Because of elevated levels of TDS, a remediation project was planned for Barstow. However, the remediation project has never been implemented.

In the late 1980's a study was conducted on behalf of the RWQCB to evaluate water quality in the Barstow area. The study showed that the organic portion of the water quality degradation was no longer present. It is unknown if the organic constituents biodegraded and/or diluted. The study did evaluate the potential remaining impacts from some inorganic constituents such as nitrate and chloride, but did not fully evaluate the extent of total dissolved solids in the aquifer.

In 1997, the United States Geological Survey published a technical report documenting the results of a study that examined the nature of the ground water in the area of the Marine Corps Logistics Yermo and Nebo Bases. This area is immediately downstream of the City of Barstow. The study documents both historic and existing degradation of ground water quality associated with total dissolved solids. The report identifies the City of Barstow's wastewater treatment plant discharges as the source of the recent ground water degradation.

The RWQCB has worked with the City of Barstow since approximately 1990 to identify and eliminate sources of elevated TDS that enter the city's wastewater treatment plant. Through an aggressive source control program, the city has reduced the concentration of TDS in its effluent from greater than 1000 mg/L to typically less than 800 mg/L.

Overdraft and Imported Water -- The Mojave Water Agency (Agency) is tasked with implementing a Regional Water Management Plan (RWMP). The water importation involves the construction of the 72-mile Mojave River Pipeline with several spreading basins. The quality of the aqueduct water is expected to be of better quality than native ground water in some downstream areas, and of lesser quality closer to the headwaters.

Overdraft of aquifers in the arid southwest is known to be a significant contributor to degradation of ground water quality. The RWQCB and the Agency must work together to implement a water management strategy for the Mojave Watershed that takes into account projected urban growth while protecting water resources for beneficial uses. As of 2002, the Agency has begun revision to the RWMP and is including a greater emphasis on water quality.

#### *Stormwater*

The specific water quality concerns associated with stormwater in desert communities have yet to be fully identified. The typical surface water concerns associated with stormwater may not be fully applicable to the watershed because the Mojave River system is dominated by ground water rather than surface water. The RWQCB has assembled a stakeholder group that includes representatives from the communities of Apple Valley, Hesperia, Victorville, and Adelanto. The goal of the stakeholder group is to develop a regional stormwater management plan. Constituents such as oil and grease, asbestos, pesticides, and herbicides could potentially be of concern. Identification of critical areas of stormwater flow and the full list of constituents of concern will be a primary goal of the stakeholder group.

#### *Solid Waste Management*

Because of its sparse population, the communities in the Mojave Watershed have historically disposed of solid waste in small landfills located near each of the communities. Due to increased urban population, competition in the solid waste disposal business, and the cost of environmental compliance, the County of San Bernardino has developed a solid waste management plan that involves closing most of the small landfills and transferring waste to regionalized facilities. The small, inactive landfills are being closed according to the schedule developed by the County. The two regionalized facilities in the watershed are located in the communities of Victorville and Barstow.

The County of San Bernardino has developed ground water and soil gas monitoring programs at many of its solid waste management sites. Ground water monitoring has indicated releases of VOCs. Landfill gas is believed to be the primary source of VOCs detected in the ground water at some sites. Releases of inorganic constituents have also been documented. The RWQCB has been working with the County of San Bernardino for several years to define the extent of these constituents in the ground water. There have been no identified impacts to domestic water supply sources at any of these sites. Pilot ground water extraction systems are in operation as preliminary methods of corrective action.

#### *Septage Management*

Although municipal wastewater treatment plants service some of the areas of the watershed, a significant number of residences and businesses have septic tanks, leachfields, and/or seepage pits. Based on a survey conducted by the County of San Bernardino, a significant number of the septic tanks in the watershed are located within the incorporated areas of the Victor Valley. The Victor Valley Wastewater Reclamation Authority and City of Adelanto are operating septage receiving facilities for treatment and disposal.

### *Septic Tanks, Seepage Pits, and Leachfields*

Although some of the communities in the watershed are serviced by sewer services, many other areas continue to discharge wastewater to septic tanks, seepage pits, and leachfields. The United States Geological Survey has conducted a study of the potential effects of leaching septic waste to ground water quality in the Victor Valley. Based on this study, it appears that the septic waste loads minimal amounts of nitrogen compounds to ground water in the Victor Valley. It is important to note that the findings of this study can only be directly applied to areas of the watershed that have similar climates and hydrogeologic conditions. Additionally, the water quality effects of leaching septic waste such as the potential for increasing total dissolved solids not been fully evaluated.

The RWQCB prohibits the installation of new septic tanks and leachfields in some areas of the watershed. These areas have one or more conditions that could result in degradation of water quality from leaching of septic waste, such as fractured bedrock, high rainfall, and shallow depth to groundwater. Some exemptions are allowed. Recently, an ad-hoc technical advisory committee was formed to discuss septic issues, and is comprised of representatives from the Regional Board, Department of Health Services, Mojave Water Agency, Victor Valley Wastewater Reclamation Authority, and cities within the Victor Valley.

### *Petroleum Underground Storage Tanks*

The Regional Board, the City of Victorville, the City of Hesperia, and the County of San Bernardino's Division of Environmental Health implement California's petroleum underground storage tank (UST) program in the watershed. Due to limited Regional Board resources, there are approximately 150 documented releases of petroleum products from USTs in the watershed that have not been fully investigated and/or remediated. Approximately 40 of these releases are known to have impacted ground water quality. Primary constituents of concern associated with these releases are benzene, toluene, xylenes, ethylbenzene, and methyl-t-butyl ether (MTBE).

### *Department of Defense Facilities*

The RWQCB is involved in corrective action activities at George Air Force Base (AFB), and the Nebo and Yermo Annexes of the Marine Corps Logistics Base (MCLB). At George AFB, the two major Operational Units (OUs) were developed based on identified sources of ground water pollution. At the MCLB, all ground water pollution issues are managed under one OU for the Nebo Annex and one OU for the Yermo Annex. The final cleanup decisions for OUs are ultimately documented in a Record of Decision (ROD), which must be agreed to by each party that is a signatory to the FFA.

#### **George Air Force Base**

OU No. 1 at George AFB was developed to address the presence of trichloroethene (TCE) in the ground water near the northeastern boundary of the base. The main source of the TCE is believed to be an industrial storm drain system that received wash water and stormwater from the flight line and surrounding maintenance areas. The Air Force has investigated the lateral and vertical extent of TCE in the aquifer, and has determined that the plume has impacted a perched upper aquifer beneath the AFB. The TCE has not effected the regional aquifer beneath the AFB, but has effected the regional aquifer off the AFB boundary to the northeast where the perched aquifer and the regional aquifer are commingled. The Air Force is currently operating a ground water extraction and treatment system to contain the plume of polluted ground water and to effectively remove the TCE from the aquifer. Over one billion gallons of ground water from the upper and lower aquifer have been extracted to remove approximately 140 pounds of the original 900 pounds of TCE.

OU No. 2 at George AFB was developed to address a plume of jet fuel resulting from chronic leakage of the fuel distribution system beneath the flight line. The jet fuel release has only affected the upper perched

aquifer. Between approximately 450,000 to 800,000 gallons of jet fuel remain floating on the ground water table surface, and over 124,000 gallons have been removed to date by skimming pumps. Studies conducted to date appear to indicate that natural biodegradation of the jet fuel components is occurring on the fringes of the dissolved phase plume. Even with the free product skimming process, the natural attenuation cleanup timeframe would be significantly long because not all of the free product can be recovered by skimming, and the remaining free product would need to first dissolve into the aquifer for biodegradation to take place. The regulatory agencies, including the RWQCB, have requested the Air Force to evaluate additional active remedial measures such as vapor extraction to enhance the recovery of the free product.

#### **Marine Corps Logistics Base**

The ground water OU at the Yermo Annex of the MCLB addresses a plume of volatile organic constituents (VOCs.) The suspected sources of the ground water pollution are the old sanitary landfill, the old industrial waste treatment plant, and former discharges to a french drain system. The plume of VOCs is traveling in an easterly direction at a rate of approximately 60 to 70 feet per year, and migrated off the MCLB base boundary. The plume has impacted two private drinking water wells, and these wells are fitted with Granular Activated Carbon (GAC) canisters to provide a safe source of drinking water. The MCLB installed a ground water pump and treatment system to contain the plume and remove dissolved phase contaminants. To date, that system has extracted over 3 billion gallons of water from eight extraction wells and removed 93 pounds of solvents. Additionally, two air sparge-soil vapor extraction systems have operated in "hot spot" areas. The Site 26 system operated for 18 months and removed 1,000 pounds of solvents. The Site 16 system has removed 3,000 pounds of solvents in six months of operation (January 2001). The ground water plume is shrinking. A major issue at this site is a water table that has declined 20 feet in 5 years.

The ground water OU at the Nebo Annex of the MCLB addresses two ground water plumes of VOCs. The North Nebo plume contains tetrachloroethene (PCE), and is associated with former industrial activities at Warehouse Two. The plume is approximately 400 feet by 1,500 feet in areal extent, and is isolated in the upper 20 feet of the aquifer. The remedial strategy for the North Nebo plume is an air sparging/soil vapor extraction system for source reduction in the area of Warehouse Two, and natural attenuation of the remaining contaminant mass in the ground water. A pump and treat system has been installed as a standby in the case whereby plume containment is deemed necessary. The anticipated cleanup timeframe to achieve the drinking water standard of 5 µg/L for PCE is estimated at 15 years.

The South Nebo plume of VOCs contains mostly TCE, which resulted from equipment cleaning at area of concern (AOC) No. 6. The plume is approximately 1,000 feet by 800 feet in areal extent, and is migrating easterly at a rate of approximately 20 feet per year. The plume has migrated off the MCLB base boundary, and has effected one private drinking water well. The residence has been piped into the base water system to ensure a safe water supply. A pump and treat system was operated for plume containment. The system consists of five extraction wells, and the extracted water is being treated by GAC and discharged to percolation ponds. Because of the low transmissivity of the aquifer, the extraction wells only produced approximately 5 gpm per well. As such, the anticipated cleanup timeframe using a pump and treat remedial strategy is estimated at 105 years. An air sparging/soil vapor extraction system pilot test was tested to determine its feasibility for reducing the remedial timeframe, and subsequently shut down.

#### *Abandoned Wells*

Because of its rural nature and agricultural/industrial history, the Mojave Watershed contains numerous production wells that have been improperly abandoned. There are also reports of improperly abandoned oil and gas wells in the watershed. These wells may provide a conduit for migration of contaminants to the ground water, and can pose a significant risk to public safety. Proper abandonment of wells is very

expensive. The San Bernardino County Division of Environmental Health and the Mojave Water Agency have been working to develop a program for the location of abandoned wells.

#### *Irrigated Agriculture and Confined Animal Facilities*

Although the acreage of irrigated agriculture in the Mojave Watershed has diminished in recent years due to urban development, agricultural water use continues to exceed urban use. Confined animal facilities in the watershed have generally consisted of dairies and chicken ranches. There is an estimated thirteen dairies in the watershed, and several chicken ranches continued to be operated in the watershed.

The RWQCB has established waste discharge requirements (WDRs) for four dairies in the watershed based on their close proximity to the Mojave River (within 1/2 mile). These WDRs limit the amount of manure that can be applied to the alfalfa fields at the dairy based on the calculated agronomic rate for nitrate consumption by the crop. In each of these four cases, some manure must be exported from the dairy because more is produced than can be applied to the irrigated land. The manure is typically exported to other irrigated agriculture sites in the watershed. As resources allow, the RWQCB will work with the remaining dairies, any of the chicken ranches, or the irrigated sites that receive the exported manure under the Nonpoint Source Program. The RWQCB will coordinate future regulation with the State Board and other appropriate agencies to implement the recently released federal Unified Animal Feeding Operations (AFOs) Strategy.

A study conducted for the RWQCB by the Department of Water Resources in 1983 identified the Mojave River floodplain as the key area requiring regulatory involvement in regards to dairy waste management. Thus, the RWQCB developed a regulatory strategy to develop WDRs only for dairies within one-half mile of the Mojave River Channel. However, RWQCB staff now recognizes that this strategy does not take into account the manure that is applied to land for agricultural purposes. Thus, a widespread program is necessary to encourage best management practices for all manure management throughout the watershed to protect the beneficial uses of ground water.

The RWQCB initiated and participates in a stakeholder group for confined animal facilities and irrigated agriculture sites. The focus of the group is education and outreach of BMPs to ensure protection of beneficial uses. The RWQCB meets with owners and operators of some dairies that are not currently regulated under WDRs. During this process, the RWQCB will work with the County of San Bernardino Division of Environmental Health Services that already inspects many of the dairies and chicken ranches regarding public health issues (e.g., vectors and odors). The stakeholder group has completed an initial database with the number of cows and waste treatment abilities at each dairy.

#### *Spills and Leaks*

The significant spills, leaks, investigation, and cleanup (SLIC) projects currently on-going in the Mojave Watershed are discussed in the following paragraphs.

#### **Burlington Northern Sante Fe Barstow Railway Yard**

The Burlington-Northern Sante Fe Railway Company (BNSF), formerly the Atchison, Topeka and Sante Fe Railway Company, historically operated and continues to operate railway maintenance facilities in the City of Barstow. Extensive soil and ground water investigations of the facilities have indicated two separate ground water plumes within the Mojave River floodplain aquifer. One plume is chlorinated hydrocarbons, and the other diesel related constituents. The chlorinated hydrocarbon plume appears to have migrated to the Mojave River channel. The RWQCB has required BNSF to further investigate the ground water impacts, and develop a cleanup strategy for restoration of the beneficial uses of the ground water. BNSF has installed and is currently operating a pilot facility consisting of intrawell air sparing/vapor extraction in the area of the chlorinated hydrocarbon plume to evaluate the technical and

economic feasibility of this remedial technology. BNSF is also working to develop a cleanup strategy for the diesel ground water plume.

In 1989 a pipeline at the BNSF Barstow Yard near "B-Hill" ruptured, releasing diesel fuel into the unsaturated zone. A subsequent investigation indicated diesel fuel floating on the ground water table surface beneath and downgradient of the release site. BNSF continues to recover free product, and has installed a soil vapor extraction/bioventing system to restore the beneficial uses of the ground water. However, rising ground water levels caused by recent years of above average recharge has rendered the system inoperative because the air injection/extraction wells are now screened below the water table surface. BNSF has proactively monitored the ground water during the last several years, and there is no evidence of plume migration. BNSF is currently evaluating options to potentially modify the existing system for operation.

#### **CALNEV Pipeline**

In 1992 the CALNEV Pipe Line Company discovered a leak of petroleum fuel at their facility located near the Community of Daggett. A subsequent soil and ground water investigation has indicated impacts to ground water quality. The constituents of concern associated with the plume include benzene and methyl-t-butyl ether (MTBE). CALNEV, which was recently acquired by GATX, has installed and is currently operating a vapor extraction system to remove the volatile components of the release from the unsaturated zone. GATX is currently defining the downgradient extent of the plume, and developing of a remedial strategy for the ground water.

#### **Victorville "D" Street Plume**

In 1989 the Southwestern Portland Cement Company, a division of Southdown, discovered the presence of PCE and TCE in production supply water at their Victorville River Plant. A subsequent investigation by Southdown indicates that the source(s) of the contaminants are hydrologically upgradient of the cement plant. Southdown continues to extract the ground water for industrial use, but no longer uses the water for municipal purposes.

The RWQCB has conducted two investigations of the "D" Street corridor in Victorville. While annual ground water sampling data continue to be collected and evaluated by Regional Board staff, the exact source of chlorinated hydrocarbons remain undetermined. Surface water sampling of the Mojave River does not indicate the presence of VOCs, but PCE was detected in a surface water sample from Oro Grande Wash at the outfall into the Mojave River. The RWQCB continues to work with local agencies to identify any potential past and/or continuing source(s) of the PCE and TCE.

#### **PG&E Chromium Ground Water Plume**

Extensive investigation by Pacific Gas and Electric (PG&E) Generating Station has identified a plume of ground water degraded by the hexavalent chromium. The general dimensions of the plume are two miles in length and one-quarter mile in width.

PG&E no longer uses hexavalent chromium in its facility operations. PG&E has implemented an aggressive corrective action program to cleanup and abate the effects of the degraded ground water. PG&E monitors the soil, ground water, and alfalfa plant tissue at the irrigation sites for the presence of hexavalent chromium. In 2001, the Regional Board required PG&E to stop using spray irrigation of crops as the treatment method because of concerns over airborne migration of hexavalent chromium. PG&E is now evaluating modification in order to continue cleanup.

#### **Aerochem El Mirage Facility**

Former wastewater disposal practices at the Aerochem industrial facility near the Community of El Mirage has resulted in degradation of ground water quality. The constituents of concern are fluoride and chlorinated hydrocarbons. The RWQCB required Aerochem to close formerly operated unlined surface impoundments. Sampling of irrigation wells located at nearby agricultural fields has indicated the presence of chlorinated hydrocarbons in one well at low concentrations. Aerochem is developing a final corrective action plan for the chlorinated hydrocarbons in the ground water. In August 2000, data indicated the presence of hexavalent chromium in ground water. Regional Board staff is conducting an investigation in conjunction with Department of Toxic Substances Control (DTSC) of the distribution of hexavalent chromium in local production wells surround the Aerochem facility.

### *Wastewater Treatment and Recycling*

The Regional Board provides regulatory oversight for several community wastewater treatment facilities. These facilities provide service for: (1) the San Bernardino Mountains - Lake Arrowhead Community Services District and Crestline Sanitation District; (2) the Victor Valley - the Victor Valley Wastewater Reclamation Authority (VWVRA); (3) the Community of Silver Lakes - San Bernardino County Service Area No. 70; (4) the City of Barstow; (5) the Yermo and Nebo Annexes of the Marine Corps Logistics Base, and (6) Adelanto Wastewater Treatment Plant. The Regional Board also provides regulatory oversight for several small package treatment plants that provide service for one or more small residential developments or commercial facilities.

The VWVRA facility is the largest treatment plant in the watershed. The treated wastewater is currently discharged to percolation ponds and to the Mojave River. Implementation of a wastewater recycling plan would involve the construction of pilot wastewater treatment plants upstream of the existing plant to facilitate the availability of high quality effluent for upstream uses. Such uses would include irrigation of parks and golf courses. The City of Victorville has recently received a federal grant of one half million dollars to explore and develop water recycling options.

One of the critical elements of the wastewater recycling plan is the discharge of wastewater to the Mojave River during the winter season when the demand for recycling water may be limited. The RWQCB's Basin Plan currently prohibits the discharge of wastewater directly to the Mojave River between the Lower Narrows at Victorville and the Mojave Forks Dam. The Basin Plan also contains numerical water quality objectives for the Mojave River that could potentially be exceeded as a result of the wastewater discharges. The RWQCB has determined that it is appropriate to provide exemption language in the Basin Plan for the direct discharge of recycled wastewater to the Mojave River between the Lower Narrows and the Mojave Forks Dam. As discussed in the Planning section above, additional characterization of the water quality in the Mojave River is necessary before a full evaluation of the numerical water quality objectives can be completed.

Wastewater recycling projects may also be pursued in the San Bernardino Mountains. Direct discharges of high quality effluent to surface water could greatly enhance the beneficial uses of these surface waters, including freshwater habitat, wildlife, and wetlands. These projects would involve careful planning, including possible modifications of numerical water quality objectives.

### *Wetland Habitat and Flood Control*

Today, most of the Mojave River channel is dry downstream of Victorville except during flood events. Historically, some areas contained water surface water throughout most of the year. Former "watering holes" for the Mormon and Spanish Trails were located along the Mojave River, which were primarily located where faults or other geologic structures force ground water to the surface. Due to years of

overdraft conditions, the ground water table has been lowered to a point where most areas no longer contain surface water. The stipulated judgment for the adjudication of the watershed attempts to address this issue by developing a fund for evaluation and restoration of these riparian vegetation areas. The California Department of Fish and Game is responsible for implementation of the fund, and is in the process of developing a riparian vegetation and wildlife habitat inventory and evaluation plan. The ultimate goal of the program will be to restore some of the historic areas that provide critical habitat for wildlife.

One of the critical wetlands projects in the watershed is San Bernardino County's Mojave River flood control management plan. The RWQCB participated in a technical advisory group that coordinated to develop the plan. The plan first identifies critical areas of the Mojave River that require flood control to ensure protection of nearby communities from floodwaters. The plan then provides recommendations for flood control activities, including minimization of wetlands impacts.

Additional critical wetlands in the watershed include Afton Canyon, Salt Creek Hills, and Harper Lake. An effort by the Bureau of Land Management to remove exotic plant species from these wetland areas is discussed below. Salt Creek Hills is the site of a University of California research facility named "ZYZYX". Natural ponds at the research facility contain Mojave Tui Chub, which is an endangered species of fish. The wetlands at Harper Lake are a primary resting and nesting place for migratory birds.

#### *Abandoned Mines*

A portion of the new Mojave National Park is located within the watershed. The National Park Service has completed an inventory of approximately 200 abandoned mines in the Park. Most of the mines are not a likely water quality threat. Other abandoned mines are present in the watershed outside the boundaries of the National Park, but within the watershed.

#### *Household Hazardous Waste Management*

The County of San Bernardino and other local agencies have documented numerous cases of unauthorized disposal of household hazardous waste. The County of San Bernardino is attempting to identify funding sources for construction and operation of household hazardous waste collection centers.

#### *Power Generation Facilities*

Power generation facilities typically use large quantities of water for heat exchange. The RWQCB provides regulatory oversight for these discharges.

The Harper Lake Company operates a solar energy generation facility at Harper Lake. Harper Lake is a 'dry lake' containing wetlands that provide valuable wildlife habitat. The Harper Lake Company currently discharges their high TDS waste to lined ponds, but is considering the potential benefits of discharging the wastewater to the wetlands. Such a project has a potential to enhance the wetlands habitat, which would be a beneficial use of the water rather than merely allowing the water to evaporate. Regional Board staff is working with the Harper Lake Company, BLM, California Department of Fish and Game, and the California Energy Commission to evaluate the project.

Other power facilities in the watershed that discharge to lined evaporation ponds include the Kramer Junction Company (solar power), Daggett Leasing Corp (solar power) and Coolwater Generating Station (oil fired).

The High Desert Power Project (at the former Georges Air Force Base) is proposing to use ground water injection of State Project water.

### *Eradication of Exotic Plant Species*

Several exotic plant species were introduced to the watershed during the 20th century. Two of these species are the Tamarisk and the Salt Cedar. These exotic species use an abundance of water, destroy native vegetation, and do not provide valuable habitat for native animals. Related water quality impacts can result from reduced flows. The Bureau of Land Management (BLM) has been working for several years to eradicate the watershed of these exotic plant species. Two key eradication sites are at Afton Canyon and Harper Lake. The primary methods used to destroy the plants are cutting, burning, and then subsequent hand applications of herbicides.

The RWQCB has been coordinating with the BLM, the Mojave Water Agency, the U.S. Fish and Wildlife Service, the CA Dept. of Fish and Game, the City of Barstow, and the U.S. Army Corps of Engineer to develop an MOU regarding these projects. The BLM is conducting surface water sampling to ensure there is no water quality degradation associated with the herbicides. Sampling data indicates no water quality impacts have resulted from the herbicide applications, and the concentrations of total dissolved solids has been greatly reduced in the increased Mojave River surface flows in Afton Canyon. (Surface water flows in Afton Canyon have increased substantially with the removal of the exotic plant species.) Additionally, many native plant and animal species have returned to areas of restored habitat.

#### 2.5c Goals and Objectives with Milestones

The following goals and objectives are tied to the above discussion of water quality issues. In many cases, stakeholder groups have already been developed to begin the development and implementation of plans for these goals and objectives. Where appropriate, the milestones have been approximated by the RWQCB. Furthermore, the RWQCB anticipates that additional goals and objectives will be developed and nurtured as the stakeholder groups become more experienced.

- The RWQCB works with the stakeholder group in the San Bernardino Mountains to evaluate surface water quality. This stakeholder groups was developed in 1997, and is actively collecting water quality data. The overall objective of this group is to evaluate the current “state of water quality” in comparison to the numerical water quality objectives in the Basin Plan that were developed in the 1970’s. The key milestone will be at the end of the two year sampling period when the group will need to evaluate the data and develop preliminary conclusions.
- The RWQCB works with the stakeholder group for the Mojave River floodplain between the Mojave Forks Dam and Afton Canyon. This stakeholder group, developed in 1997, had completed a Sampling and Analysis Plan. The first key milestone will be at the end of the first year of sampling to evaluate the data and develop recommendations for further sampling.
- The RWQCB is working with a stakeholder group in the Victor Valley to develop a stormwater management plan for implementation. This community will be subject to federal municipal stormwater requirements in the year 2001, and the group is being proactive to develop a plan for action. The group is attempting to secure federal grant funding for development of the plan. The milestones will be better developed once funding is secured. The key milestone is obviously the development of a final plan to meet the federal stormwater requirements.
- There are numerous improperly abandoned wells in the watershed. The stakeholders throughout the watershed have a goal of identifying and properly closing these wells. The RWQCB will be assisting the County of San Bernardino and the Mojave Water Agency in the prioritization of wells that have already been identified. Grant funding may be available to properly abandon some wells. Once funding is secured it will be easier to develop milestones.

- The SWRCB has published numerous documents regarding management of nonpoint source pollution. This watershed chapter discusses several possible nonpoint sources, including confined animal facilities and irrigated agriculture. The RWQCB is working with a stakeholder group regarding nonpoint source pollution management.
- With the numerous activities on-going in the watershed, it would be prudent to develop a graphic information system (GIS). A Mojave Watershed GIS could link to other GIS programs in the watershed, and would provide helpful insight into potential water quality problems and possible implementation programs. The RWQCB will cooperate with the Mojave Water Agency and other local entities to develop a GIS for the watershed.
- The RWQCB is currently implementing numerous core regulatory programs in the watershed as discussed in this watershed chapter above. The RWQCB will continue its level of effort in programs such as Department of Defense, Title 27, Underground Storage Tanks, 401/404, stormwater, and NPDES.
- A stakeholder group has been developed to create a matrix of water quality issues and associated stakeholders. The draft matrix was developed in April 1998 and circulated to stakeholders
- A stakeholder group has been developed to evaluate the beneficial uses of ground water and surface water in the watershed. The goals and milestones of this group will be more firmly established after its first several meetings.
- The RWQCB will support the County of San Bernardino and other local agencies in their attempts to provide appropriate disposal options for septage waste and household hazardous waste.
- The RWQCB will support and coordinate with the County of San Bernardino and the National Park Service regarding abandoned mine issues.
- The RWQCB will participate in the Mojave Water Agency's riparian habitat restoration program, and will continue efforts to work with the County of San Bernardino regarding flood control.
- The RWQCB will organize and participate in education programs at local schools.

#### 2.5d Ongoing and Proposed Tasks (Fiscal Years 02-03 to 07-08)

The following is a list of tasks that will be completed to achieve the above-referenced tasks.

##### **Task Group 1 - Administrative Oversight**

2.5/1.1 **Update and revise the WMI Chapter** and goals periodically to reflect the needs of the watershed, stakeholder interests, and state budget concerns.

2.5/1.2 **Complete Status Reports** on watershed issues, including quarterly reports to the RWQCB.

2.5/1.3 **Complete and Circulate the Watershed Stakeholder Matrix** for all potential stakeholders. This matrix will hopefully solicit input and involvement from many stakeholders that have not yet become involved in the effort.

2.5/1.4 **Solicitation and Coordination of 205(j) and 319(h) grant proposals** and management of contracts, if necessary.

2.5/1.5 **Review of Non-Regulated Facility CEQA Documents** is a primary function for the watershed coordinator and all RWQCB staff that work on projects within the watershed. Initial evaluation of CEQA documents can involve significant staff resources. Although the RWQCB may not take regulatory action for the project, it may provide comments and/or attend public meetings to ensure appropriate consideration of water quality issues.

### **Task Group 2 - General Public Outreach and Education**

The RWQCB continues to work with stakeholders to promote cooperative and “non-regulatory” approaches to protection of water quality and associated beneficial uses. Continued efforts will be necessary to gain acceptance and support from the watershed communities.

2.5/2.1 **Educational Outreach** is an important element of public education. The RWQCB will schedule presentations at local schools to inform children about the watershed effort.

2.5/2.2 **Participation in existing Technical Advisory Groups**, such as the Mojave Water Agency TAC, is necessary to inform communities regarding the progress of the watershed effort. The Mojave Water Agency TAC meets monthly, and the RWQCB will continue attendance at these meetings.

2.5/2.3 **Community Outreach** efforts are necessary to promote the watershed effort for groups that would otherwise not hear about the program. The RWQCB continue attendance at local community meetings and events to participate and answer questions regarding the watershed effort.

### **Task Group 3 - Water Quality Monitoring and Analysis**

The RWQCB has developed three stakeholder groups that will be conducting monitoring and data analysis. The goals and objectives of these three groups are discussed in detail in this watershed chapter above. The tasks are briefly outlined as follows.

2.5/3.1 **Surface Water Sampling in the headwaters** of the watershed will continue and data will be evaluated. The RWQCB is participating in the sampling program by collecting samples for laboratory analysis, and by assembling the data for circulation to the stakeholders. The stakeholder group will continue to meet to discuss the data that has been collected and determine if any modifications to the sampling program are necessary. Appropriately trained and monitored volunteer resources are being utilized to augment Regional Board staff surface water collection efforts.

2.5/3.2 **Surface and Ground Water Sampling below the Mojave Forks Dam** was initiated in March 1999. The level of effort dedicated to this sampling program will be dependent upon the involvement of the USGS. The RWQCB contributed \$14,000 of contract money towards this effort in FY 98/99. Sampling will continue as funds are available.

2.5/3.3 **Sampling of Stormwater** will be one element of the program for development of a community based stormwater management plan. This effort will be refined by the stormwater stakeholder group.

### **Task Group 4 - Information Management**

2.5/4.1 **Development of a GIS** system is important for problem identification and solution implementation. The RWQCB will be working with stakeholders in the watershed to develop and coordinate a GIS. One element of this effort will be to obtain aerial and satellite photographs of the watershed. Another element of the effort will be Global Position System (GPS) logging of critical watershed locations for integration into the GIS.

2.5/4.2 **Water Quality Data Management** is essential for the watershed effort to maintain an accurate database of available information. The RWQCB has assembled and circulated to stakeholders a database of historic and current water quality data for surface water in the watershed. The RWQCB will maintain this database and circulate a revised report periodically.

#### **Task Group 5 - Non-Point Source Control**

2.5/5.1 **Irrigated Agriculture and Confined Animal Facilities** can provide a significant amount of pollutants if not properly managed. Numerous stakeholders in this arena have yet to become involved in the watershed program. The RWQCB has initiated a stakeholder group as a step in developing a cohesive program for irrigated agriculture and confined animal facilities.

2.5/5.2 **Abandoned Wells** can be a significant water quality threat if the wells are not properly abandoned. The RWQCB will continue efforts to solicit funding and work with other stakeholders to identify, prioritize, and close wells that are not properly abandoned.

2.5/5.3 **Stormwater** can be a critical element of non-point source pollution. As discussed above in this watershed chapter, the RWQCB has develop a stakeholder group to address municipal stormwater in the Victor Valley. Additional groups may be developed to address stormwater in other areas of the watershed.

2.5/5.4 **Solicitation and Management of 319(h) Grants** will be an important part of the non-point source program. Grants will hopefully be attained for each of the three above-referenced non-point source problems in the watershed.

#### **Task Group 6 - General Planning**

Planning activities for this watershed are generally discussed in this chapter above. The following is a brief outline of activities.

2.5/6.1 **The beneficial use stakeholder group** discussed above will be evaluating the current and probable future beneficial uses of water resources in the watershed. The exact goals and tasks of this stakeholder group have yet to be defined.

2.5/6.2 **Evaluation of the numerical water quality objectives** for the watershed is a long-term planning project. This effort will need to consider existing and probable future activities in the watershed, and will require the greatest amount of involvement from a myriad of stakeholders.

2.5/6.3 **Development of TMDLs** or other regulatory strategy for the Mojave River floodplain will also be a long-term planning process. It is uncertain if TMDLs will be an appropriate strategy for the Mojave River system because of its intermittent flow characteristics and annual/seasonal variations in water quality.

2.5/6.4 **Development of exemption language** for a waste discharge prohibition in the Basin Plan will likely be completed for direct discharges to the Mojave River between the lower narrows at Victorville and the Mojave Forks Dam. Revisions to prohibition and exemption language may also be considered for other areas of the watershed.

#### **Task Group 7 - Core Regulatory Programs**

The RWQCB will continue its existing level of effort in core regulatory programs for the watershed. The following table lists the projects that are currently addressed in core regulatory programs, and summarizes the anticipated activities that will occur for these sites. Activities such as SMR reviews and inspections occur on a scheduled basis. Oversight of corrective action and investigation for leaking sites is a

continuing process that requires review of technical reports, attendance at meetings, frequent written comments, and potential enforcement actions. Permit revision activities are planned for sites where permits will expire in the 5 year planning period, and/or for sites that are known to have changing conditions in the planning period that will necessitate a permit revision. An example of a changing condition is a closing landfill that will require a permit revision to formally approve of a closure plan and require implementation of a post-closure maintenance plan.

#### **Task Group 8 - Protection of Wetlands and Wildlife Habitat**

**2.5/8.1 Participate in the Mojave Water Agency's Riparian Vegetation Restoration Program** that was established in accordance with the adjudication process.

**2.5/8.2 Coordinate with the San Bernardino County Flood Control** Department regarding flood control projects in wetland areas of the Mojave River Floodplain.

**2.5/8.3 Continue Implementation of the Federal 401 and 404** programs to ensure compliance with federal regulations and protection of beneficial uses.

**2.5/8.4 Coordinate with the Bureau of Land Management** regarding their efforts to eradicate exotic plant species in the watershed. These efforts improve surface flows and water quality.

**2.5/8.5 Coordinate with the BLM, CDFG, CEG, and the Harper Lake Company** regarding a potential project to enhance the wetland habitat at Harper Lake.

#### **Task Group 9 - Abandoned Mines**

**2.5/9.1 Coordinate with the County of San Bernardino** regarding mining projects that have been abandoned in the watershed.

**2.5/9.2 Coordinate with the National Park Service** regarding mining projects that have been abandoned within the boundaries of the new Mojave National Park.

**WATERSHED UNIT: Mojave**

Main Watershed(s): Mojave

(PY Estimates to be completed in next WMI Chapter Update)

| <b>EXPECTED TASKS</b>  | <b>PY Estimate by Fiscal Year</b> |                          |                          |                          |                     |
|--|-----------------------------------|--------------------------|--------------------------|--------------------------|---------------------|
|  | <b>FY<br/>02-<br/>03</b>          | <b>FY<br/>03-<br/>04</b> | <b>FY<br/>04-<br/>05</b> | <b>FY<br/>05-<br/>06</b> | <b>FY<br/>06-07</b> |
| <b>WATERSHED PROTECTION/SUPPORT TASKS</b>  |                                   |                          |                          |                          |                     |
| <b>Nonpoint source implementation</b>  |                                   |                          |                          |                          |                     |
| Work with the USDA, Natural Resources Conservation District to promote use of BMPs at Concentrated Animal Facility Operations within the Mojave River watershed (corral areas, wash water disposal, manure management, foster stewardship, etc.) |                                   |                          |                          |                          |                     |
| Develop General WDRs for Dairies if appropriate  |                                   |                          |                          |                          |                     |
| Work with VVWRA, MWA, Apple Valley, Hesperia and SB County to determine impact from septic systems and develop appropriate BMPS to prevent water quality impacts   |                                   |                          |                          |                          |                     |
|  |                                   |                          |                          |                          |                     |
| <b>Nonpoint source outreach/education</b>  |                                   |                          |                          |                          |                     |
| Participate in regular meetings including (but not limited to) Mojave Water Agency TAC, Mojave Water Agency Oeste TAC, Mojave River Animal Facility Group; participate in one-time activities such as Earth Day, Science Fairs, etc              |                                   |                          |                          |                          |                     |
| Solicit project proposals for funding under CWA 319, Prop 13 and CWA 205j  |                                   |                          |                          |                          |                     |
| Coordinate Groundwater Monitoring in Hinkley area with other agencies and disseminating data to local residents  |                                   |                          |                          |                          |                     |
| Participate in Restoration Advisory Boards at DoD Facilities   |                                   |                          |                          |                          |                     |
| Participate in community groups such as Sierra Clubs and schools to discuss water quality issues   |                                   |                          |                          |                          |                     |
| Determine effects of "Dry Wells" used to percolate stray water in Victorville, Apple Valley and Barstow  |                                   |                          |                          |                          |                     |
|  |                                   |                          |                          |                          |                     |
| <b>Nonpoint source contract management</b>   |                                   |                          |                          |                          |                     |
| No contracts for FY 02-03  |                                   |                          |                          |                          |                     |
|  |                                   |                          |                          |                          |                     |
| <b>Timber Harvest (non-federal lands)</b>  |                                   |                          |                          |                          |                     |
| Probable Lake Arrowhead Area THP reviews   |                                   |                          |                          |                          |                     |
|  |                                   |                          |                          |                          |                     |
| <b>Prop. 13 contract management</b>  |                                   |                          |                          |                          |                     |
| No contract for FY 02-03   |                                   |                          |                          |                          |                     |
|  |                                   |                          |                          |                          |                     |
| <b>205j WQ planning contract management</b>  |                                   |                          |                          |                          |                     |

| <b>EXPECTED TASKS</b>   | <b>PY Estimate by Fiscal Year</b> |                          |                          |                          |                     |
|---|-----------------------------------|--------------------------|--------------------------|--------------------------|---------------------|
|   | <b>FY<br/>02-<br/>03</b>          | <b>FY<br/>03-<br/>04</b> | <b>FY<br/>04-<br/>05</b> | <b>FY<br/>05-<br/>06</b> | <b>FY<br/>06-07</b> |
| No contracts for FY 02-03   |                                   |                          |                          |                          |                     |
| <b>Basin Planning</b>   |                                   |                          |                          |                          |                     |
| Work with staff in Antelope Valley Unit to restore exemption Criteria for Mojave River Prohibitions   |                                   |                          |                          |                          |                     |
| Develop revised WQOs for the Mojave River Watershed   |                                   |                          |                          |                          |                     |
| <b>Wetlands management and protection</b>   |                                   |                          |                          |                          |                     |
| Work with City of Victorville, Barstow, and Hesperia and Town of Apple Valley to promote wetland areas along Mojave River riparian core area. |                                   |                          |                          |                          |                     |
| <b>Watershed management</b>   |                                   |                          |                          |                          |                     |
| Work with stakeholders to develop GIS Capability  |                                   |                          |                          |                          |                     |
| Develop Stakeholder groups and hold stakeholder meetings, Participate in efforts of other stakeholders  |                                   |                          |                          |                          |                     |
| Revise Watershed Chapters   |                                   |                          |                          |                          |                     |
| Analyze data from Mojave River Sampling program, develop recommendations and distribute to stakeholders                                       |                                   |                          |                          |                          |                     |
| Support SWAMP and ensure that all other surface water data are entered into database  |                                   |                          |                          |                          |                     |
| <b>REGULATORY TASKS</b>   |                                   |                          |                          |                          |                     |
| <b>NPDES</b>  |                                   |                          |                          |                          |                     |
| Enroll General Permits  |                                   |                          |                          |                          |                     |
| 6000U000014 Verizon Statewide Utility (expires by 8/15/01)  |                                   |                          |                          |                          |                     |
| Evaluate and implement CTR at VVWRA   |                                   |                          |                          |                          |                     |
| Conduct Pretreatment Compliance Inspections   |                                   |                          |                          |                          |                     |
| <b>Stormwater</b>   |                                   |                          |                          |                          |                     |
| Implement Phase II Municipal SW Permits   |                                   |                          |                          |                          |                     |
| Oversee Caltrans Dist 8 SW Implementation   |                                   |                          |                          |                          |                     |
| <b>Non-15 (WDR) – exp by 6/30/03</b>  |                                   |                          |                          |                          |                     |
| 6B360107001 – III - Lake Arrowhead CSD WTFS (exp 5/11/99)   |                                   |                          |                          |                          |                     |
| 6B368090019 – III - Sequoia Apartments (exp 8/14/01)  |                                   |                          |                          |                          |                     |
| 6B368090017 – III - Willow Oak Estates WTF (exp 7/1/01)   |                                   |                          |                          |                          |                     |
| 6B368054001 – III - Mountain View Villas (exp 1/9/01)   |                                   |                          |                          |                          |                     |
| 6B368070003 – III - Sequoia Villas Apartments (exp 1/9/01)  |                                   |                          |                          |                          |                     |
| 6B364520003 – III - Heaps Peak Concrete Batch Plants (exp 7/11/00)  |                                   |                          |                          |                          |                     |
| 6B361105001 – III - Rancho De Las Brisas (exp 4/12/00)  |                                   |                          |                          |                          |                     |
| 6B361590001 – III - Lake Arrowhead CSD Exemptions (exp 7/13/99)   |                                   |                          |                          |                          |                     |
| 6B362050001 – III - Bear Valley MHP WTF (exp 5/11/99)   |                                   |                          |                          |                          |                     |
| 6B361130001 – III - Road House Restaurant (exp 1/12/99)   |                                   |                          |                          |                          |                     |
| 6B368090010 – III - Jensen’s Market (exp 1/12/99)   |                                   |                          |                          |                          |                     |
| 6B360105001 – III - Calico Ghost Town Rec Fac WTF (exp 9/8/98)  |                                   |                          |                          |                          |                     |
| 6B368090010 – III - Crestline CSD Crestline Area Exemptions (exp 1/8/96)  |                                   |                          |                          |                          |                     |

| <b>EXPECTED TASKS</b>   | <b>PY Estimate by Fiscal Year</b> |                          |                          |                          |                     |
|---|-----------------------------------|--------------------------|--------------------------|--------------------------|---------------------|
|   | <b>FY<br/>02-<br/>03</b>          | <b>FY<br/>03-<br/>04</b> | <b>FY<br/>04-<br/>05</b> | <b>FY<br/>05-<br/>06</b> | <b>FY<br/>06-07</b> |
| 6B360115009 – III - SB Co CSA 56 Comm of Wrightwood (exp 4/22/91)       |                                   |                          |                          |                          |                     |
| 6B360801005 – III - Caltrans Desert Oasis Rest Area (exp 5/12/03)       |                                   |                          |                          |                          |                     |
| 6B368070025 – III - Melina Square (exp 3/10/03)                         |                                   |                          |                          |                          |                     |
| 6B368090038 – III - Desert Terrace Appartments (exp 1/14/03)            |                                   |                          |                          |                          |                     |
| 6B368070019 – III - Bear Valley Firestone (exp 1/14/03)                 |                                   |                          |                          |                          |                     |
| 6B360703001 – II – Ft Irwin WWTP (exp 5/13/03)                          |                                   |                          |                          |                          |                     |
| <b>Water Quality Certification</b>                                      |                                   |                          |                          |                          |                     |
| Review projects and take appropriate actions                            |                                   |                          |                          |                          |                     |
| <b>Enforcement</b>  |                                   |                          |                          |                          |                     |
| Informal and Formal Enforcement as needed                               |                                   |                          |                          |                          |                     |
| Shaharold Mine, Ivanpah Mill, Telegraph Mine, Morningstar Mine CDO      |                                   |                          |                          |                          |                     |
| City of Victorville “D” St TCE Plume                                    |                                   |                          |                          |                          |                     |
| Revise Aerochem CAO   |                                   |                          |                          |                          |                     |
| Revise CalNev CAO   |                                   |                          |                          |                          |                     |
| <b>Chapter 15 – exp by 6/30/03</b>                                      |                                   |                          |                          |                          |                     |
| 6B362035001 – III - Newberry Compressor Station (exp 10/10/01)          |                                   |                          |                          |                          |                     |
| 6B360304025 – I – SB Co – Victorville Class III Landfill (exp 9/14/00)  |                                   |                          |                          |                          |                     |
| 6B360304013 – I – SB Co – Lenwood/Hinkley Landfill (exp 9/14/00)        |                                   |                          |                          |                          |                     |
| 6B360304003 – I – SB Co - Apple Valley Class III Landfill (exp 6/08/95) |                                   |                          |                          |                          |                     |
| 6B360304020 – I – SB Co – Phelan Landfill (exp 1/8/03)                  |                                   |                          |                          |                          |                     |
| 6B360304005 – I – SB Co – Barstow Class II LF/Sludgefarm (exp 7/17/02)  |                                   |                          |                          |                          |                     |
| 6B369107002 – II - TPS Adelanto Soil Recycling Center (exp 11/14/01)    |                                   |                          |                          |                          |                     |
| 6B362098001 – I - Molycorp Mountain Pass Mine and Mill (exp 6/13/96)    |                                   |                          |                          |                          |                     |
| 6B369003001 – II - Molycorp New Ivanpah Dry Lake Evp (exp 6/14/00)      |                                   |                          |                          |                          |                     |
| 6B362036002 – I –Coolwater Generating Station (exp 7/16/02)             |                                   |                          |                          |                          |                     |
| 6B368020008 – II - Fort Cady Borate (exp 5/12/03)                       |                                   |                          |                          |                          |                     |
| <b>Dept of Defense</b>  |                                   |                          |                          |                          |                     |
| 166-61 – George AFB (CERCLA – RB Lead)                                  |                                   |                          |                          |                          |                     |
| 166-56 – Ft Irwin (Non CERCLA – DTSC Lead)                              |                                   |                          |                          |                          |                     |
| 166-57 – MCLB (CERCLA – DTSC Lead)                                      |                                   |                          |                          |                          |                     |
| 166-6- - Barstow Dagget Airport (FUDS)                                  |                                   |                          |                          |                          |                     |
| <b>Underground Storage Tanks</b>  |                                   |                          |                          |                          |                     |
| Regulatory oversight of RB Lead UST sites                               |                                   |                          |                          |                          |                     |
| Regulatory support for County and City Lead UST sites                   |                                   |                          |                          |                          |                     |
| <b>Aboveground Storage Tanks</b>  |                                   |                          |                          |                          |                     |
| No AST program activities are planned                                   |                                   |                          |                          |                          |                     |
| <b>Spill or complaints from unregulated sites</b>                       |                                   |                          |                          |                          |                     |
| 206-01 – BNSf Classification Yard                                       |                                   |                          |                          |                          |                     |
| 206-03 – BNSF Diesel Shops  |                                   |                          |                          |                          |                     |
| 206-05 – CalNev Pipeline (Kinder Morgan)                                |                                   |                          |                          |                          |                     |

| <b>EXPECTED TASKS</b>              | <b>PY Estimate by Fiscal Year</b> |                          |                          |                          |                     |
|------------------------------------|-----------------------------------|--------------------------|--------------------------|--------------------------|---------------------|
|                                    | <b>FY<br/>02-<br/>03</b>          | <b>FY<br/>03-<br/>04</b> | <b>FY<br/>04-<br/>05</b> | <b>FY<br/>05-<br/>06</b> | <b>FY<br/>06-07</b> |
| 206-10 – Molycorp Mtn Pass Cleanup |                                   |                          |                          |                          |                     |
| VVL Office Spill Coordinator       |                                   |                          |                          |                          |                     |
| Unregulated Site Spill Response    |                                   |                          |                          |                          |                     |

**CONTRACT NEEDS TO SUPPORT ABOVE EXPECTED TASKS:**

List any anticipated contract needs here (include brief description, estimated needed and estimated contract term by fiscal year)

| <b>Description</b>  | <b>Amount Needed</b> | <b>Contract Term</b> |
|---|----------------------|----------------------|
| Evaluate current water quality objectives along Mojave River and develop recommendations to modify objectives | \$100,000            | 2-yr                 |
|   |                      |                      |

| <b>DESIRABLE TARGETED TASKS OR PROJECTS</b>   | <b>PY Estimate by Fiscal Year</b> |                          |                          |                          |                          |
|---|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   | <b>FY<br/>02-<br/>03</b>          | <b>FY<br/>03-<br/>04</b> | <b>FY<br/>04-<br/>05</b> | <b>FY<br/>05-<br/>06</b> | <b>FY<br/>06-<br/>07</b> |
| <b>Implement BMPs/Improve Water Quality</b>   |                                   |                          |                          |                          |                          |
| Work with Mojave Water Agency, San Bernardino County and others to properly destroy abandoned wells   |                                   |                          |                          |                          |                          |
| Work with Mojave National Preserve to identify abandoned mines and develop appropriate closure criteria for these mines to include water quality protection   |                                   |                          |                          |                          |                          |
| <b>Habitat Restoration/Beneficial Use Enhancement</b>   |                                   |                          |                          |                          |                          |
| Oro Grande Basin Riparian Habitat Restoration   |                                   |                          |                          |                          |                          |
| Waterman Fault Riparian Habitat Restoration   |                                   |                          |                          |                          |                          |
| Deep Creek Habitat Restoration  |                                   |                          |                          |                          |                          |
| Victorville Area Riparian Habitat Enhancement in conjunction with SB Co Flood Control Department  |                                   |                          |                          |                          |                          |
| Work with Bureau of Land Management and others to address invasive species (salt cedar) along the Mojave River  |                                   |                          |                          |                          |                          |
| <b>Assess Loadings and Impacts</b>  |                                   |                          |                          |                          |                          |
| Develop TMDL for Mojave River for TDS between Upper and Lower Narrows   |                                   |                          |                          |                          |                          |
| Evaluate increasing TDS concentrations on the Agate Wellfield in west of Barstow near Lenwood   |                                   |                          |                          |                          |                          |
| Determine Cumulative Effects of SWP water importation including from Silverwood Reservoir and other MWA Discharge locations. Work with MWA in evaluating water quality issues in the revised MWA Regional Water Management Plan |                                   |                          |                          |                          |                          |
| Assess pollutant loading from unsewered communities such as Wrightwood, Yermo and Kramer Junction   |                                   |                          |                          |                          |                          |
| Assess nutrient loading from golf courses to adjacent surface waters and to   |                                   |                          |                          |                          |                          |

| <b>DESIRABLE TARGETED TASKS OR PROJECTS</b>  | <b>PY Estimate by Fiscal Year</b> |                          |                          |                          |                          |
|--|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|  | <b>FY<br/>02-<br/>03</b>          | <b>FY<br/>03-<br/>04</b> | <b>FY<br/>04-<br/>05</b> | <b>FY<br/>05-<br/>06</b> | <b>FY<br/>06-<br/>07</b> |
| groundwater  |                                   |                          |                          |                          |                          |
| <b>Research-oriented Studies</b>   |                                   |                          |                          |                          |                          |
| Determine extent of MTBE in surface waters such as Lake Arrowhead, Spring Valley Lake, Lake Gregory, Mojave River locations        |                                   |                          |                          |                          |                          |
| Participate with USGS in High Desert Study of Chromium   |                                   |                          |                          |                          |                          |
| <b>Water Conservation and Management</b>   |                                   |                          |                          |                          |                          |
| Work with Mojave Water Agency and Victor Valley Wastewater Reclamation Authority in developing wastewater recycling projects       |                                   |                          |                          |                          |                          |
| Work with USDA – Mountain –Desert Council Water Conservation group to develop programs for conserving water and protecting habitat |                                   |                          |                          |                          |                          |
| <b>Monitoring</b>  |                                   |                          |                          |                          |                          |
| Improve current surface water monitoring program and data collection and reporting. Incorporate existing data into GIS             |                                   |                          |                          |                          |                          |
| <b>Education and Outreach</b>  |                                   |                          |                          |                          |                          |
| Include Water Quality Education Component in the new Mojave River Trail  |                                   |                          |                          |                          |                          |
| <b>Watershed Planning</b>  |                                   |                          |                          |                          |                          |
| Develop Mojave Watershed Plan  |                                   |                          |                          |                          |                          |
| <b>Land Acquisition/Conservation</b>   |                                   |                          |                          |                          |                          |
|  |                                   |                          |                          |                          |                          |

**CONTRACT NEEDS TO SUPPORT ABOVE DESIRABLE TARGETED TASKS:**

| <b>Description</b>   | <b>Amount Needed</b> | <b>Contract Term</b> |
|--|----------------------|----------------------|
| Oro Grande Basin Riparian Habitat Improvement – pilot project with MWA to reduce stressed riparian habitat conditions (see 3/23/01 email)  | \$100,000            | 2 yr                 |
| Urban Runoff to Lake Arrowhead and Lake Gregory and tributary streams – identify non-point pollution sources and develop BMP plan (see 3/23/01 email)  | \$100,000            | 2 yr                 |
| Agricultural Runoff to the Mojave River and underlying groundwater – develop specific monitoring plan, identify source areas and identify specific BMP to reduce nitrate, chloride, and TDS levels (see 3/23/01 email) | \$100,000            | 2 yr                 |
| San Bernardino Mountains Watershed Plans – identify non-point pollution sources and specific BMPs (see 3/23/01 email)  | \$100,000            | 2 yr                 |
| Victor Valley Area Watershed Plan – identify non-point pollution sources and specific BMPs (see 3/23/01 email)   | \$100,000            | 2 yr                 |
| Develop long term GIS support contract to support watershed planning functions   | \$100,000            | 2 yr                 |
|  |                      |                      |

