Attachment 3

Anza Borrego Desert Integrated Regional Water Management

Planning Grant Proposal

Work Plan

Attachment 3 consists of the following items:

- ✓ **Introduction**
- ✓ **Current Status in Meeting IRWM Plan Standards (page 22)**
- ✓ **Grant Work Plan (page 24)**
  1. Stakeholder Outreach & Program Administration
  2. Regional Water Resources Plans
  3. Updating the ABD-IRWM Plan
  4. Grant Administration
- ✓ **Additional IRWM Plan Work (page 40)**

1. Introduction

The Anza Borrego Desert (ABD) Integrated Regional Water Management (IRWM) Region (Region), which was formally approved through the California Department of Water Resources' (DWR's) Region Acceptance Process (RAP) in 2009, is unique compared to other IRWM regions for several reasons.

Unique Attributes of the Region:

- Over 70% is comprised of important State resources (Anza-Borrego Desert State Park).
- Almost 100% of the Region qualifies as a DAC.
- Faces critical water supply issues relating to sole reliance on dwindling groundwater resources.

The ABD Region is largely comprised (over 70%) of State land that falls within the jurisdiction of the Anza-Borrego Desert State Park (State Park). For this reason, the Region possesses unique natural and cultural resources that are irreplaceable and of Statewide and National importance. Designated as a National Natural Landmark in 1974 and a Biosphere Reserve by the United Nations, the State Park contains the largest area of open wilderness within the State of California, including approximately 61 sensitive plant species, 86 sensitive animal species, nine (9) California Historic Landmarks, and innumerable cultural resource sites (Anza-Borrego Desert State Park 2005). Major drainages within the State Park include Rockhouse Canyon, Coyote Creek, Borrego Palm Canyon, Tubb Canyon, Grapevine Canyon, Fan Felipe Creek, Fish Creek, Rodriguez and Oriflamme Canyons, Vallecito Creek, Canebrake and Bow Willow Canyons, and Carrizo Creek. Alluvial valleys within the State Park are important for water resources as they provide the conduit through which runoff can infiltrate to regional groundwater basins. However, groundwater overdraft conditions could potentially adversely impact the State Park's mission to preserve and to conserve the natural capital of the desert ecosystems within the Park.

Second, the Region is unique because almost 100% of the Region qualifies as a disadvantaged community (DAC). Stakeholders have expressed concerns about the affordability (pumping and treatment costs) and quality of groundwater supplies within the Region for these DAC residents. Therefore, it is

critical to ensure that the integrated planning process supports maintenance of a sustainable and safe water supply in accordance with Statewide Priorities.

Given its particular value regarding natural resources and DACs, the Region faces critical water supply issues that must be addressed through collaborative planning and management. The Region relies on groundwater resources for its sole source of water supply; yet existing groundwater resources of the Borrego Valley are in a state of overdraft and potentially face substantial water quality issues which could adversely impact the State Park's mission to preserve and to conserve the natural capital of the desert ecosystems. Due to the Region's unique nature, it is imperative that the ABD IRWM Plan be completed to meet DWR's IRWM Plan Standards so as to comprehensively address the Region's water resource issues, while positioning the Region for necessary funding to implement critical water supply and water quality projects.

Regional Background

The following information, adapted from the 2009 RAP submittal, the Draft IRWM Plan, and the Planning Grant-Round 1 Application, provides general background information regarding the Region.

Establishment of the ABD Region

In 2006, the Borrego Water District (BWD) began working to secure a position within an IRWM Region in the San Diego or Colorado River Funding Areas. However, these attempts were unsuccessful due to political boundary considerations. In 2009, BWD partnered with the County of San Diego (County) and Resource Conservation District of Greater San Diego County (RCD) to form the ABD IRWM Region, which would better reflect the geologic and hydrologic conditions of the Borrego Valley area. In 2009, the Region officially became an IRWM region through DWR's RAP approval.

The original RAP submittal for the Borrego Valley area was limited to the Borrego Valley Watershed within San Diego County, but was later expanded to include the portion of San Diego County that lies in the Colorado River Hydrologic Basin, the entire Borrego Valley Watershed that extends into Riverside County, and the area of San Diego County east of the Tecate Divide (refer to **Figure 3-1** and **Figure 3-2**). The expanded Region includes the entire Anza-Borrego Desert State Park, four public water purveyors, and six separate tribal lands.

Details regarding the history of the ABD Region, including letters that demonstrate the history described above are included as **Exhibit A**.

Figure 3-1: Jurisdictions within the ABD IRWM Region

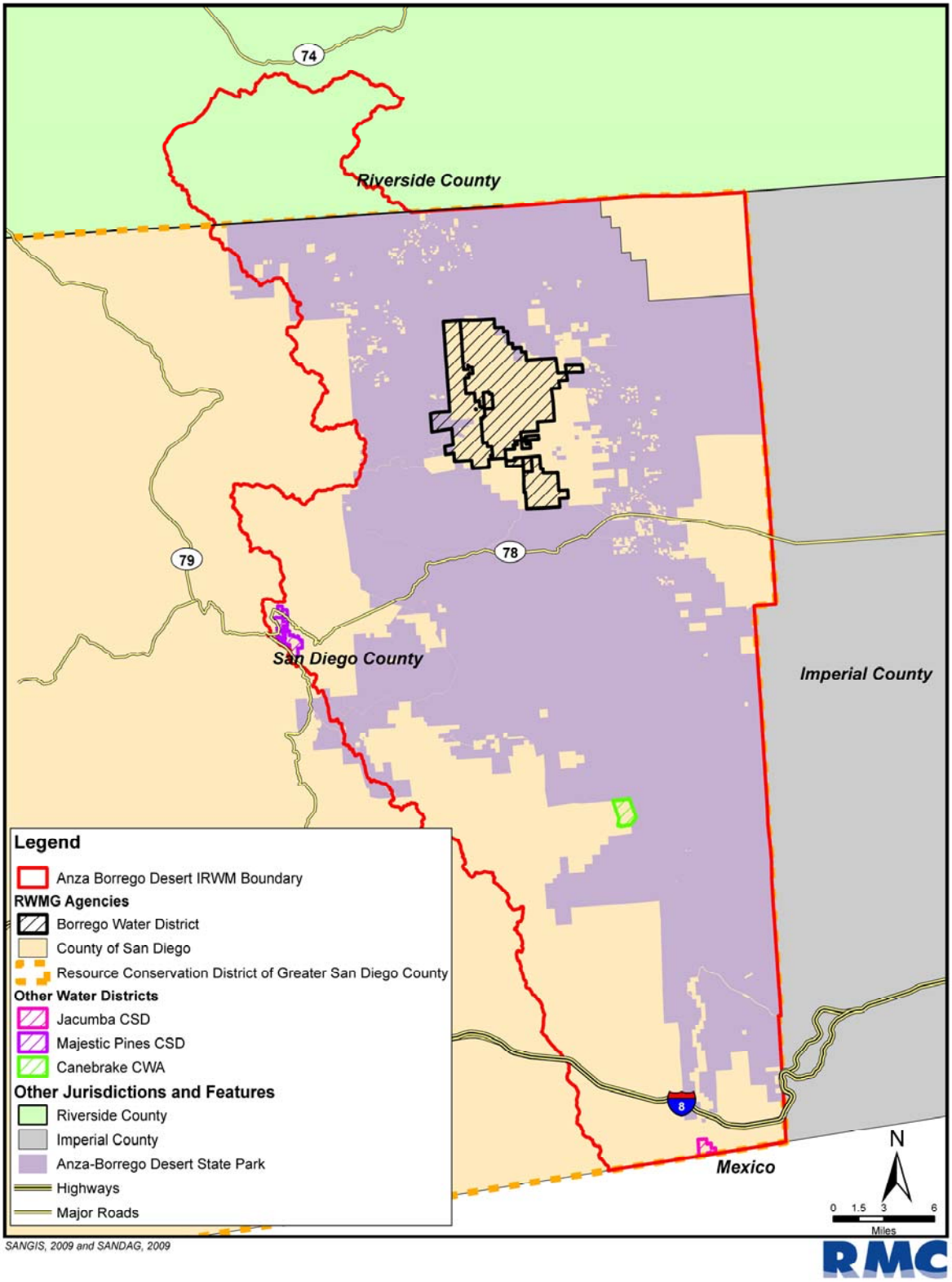
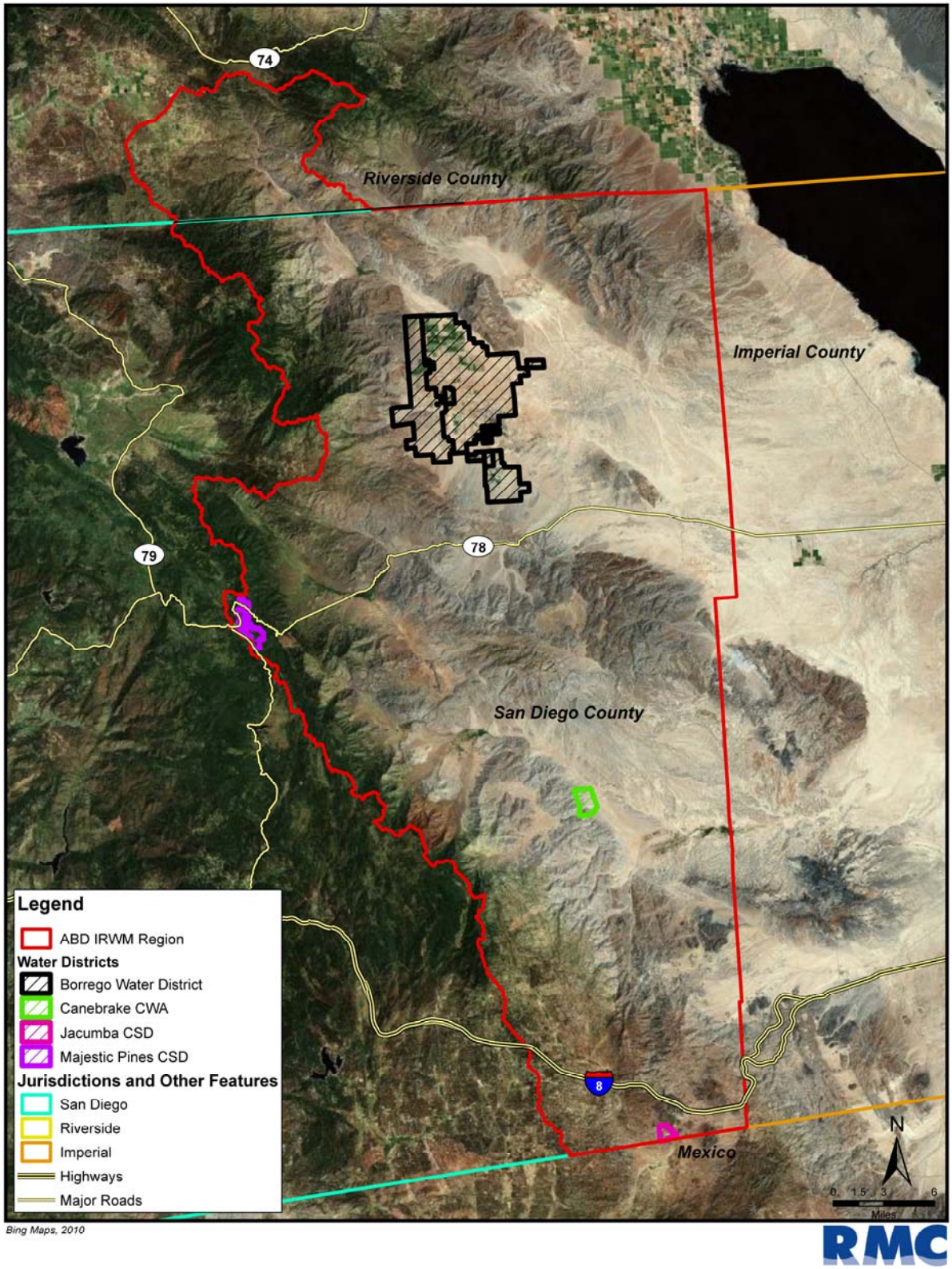


Figure 3-2: Aerial Map of the Anza Borrego Desert IRWM Region



Regional Water Management Group

To comply with the IRWM requirements, a Regional Water Management Group (RWMG) was formed in 2009 to implement the ABD IRWM Program. Three local agencies comprise the RWMG:

- Borrego Water District (BWD),
- County of San Diego (County), and
- Resource Conservation District of Greater San Diego County (RCD).

The BWD service area overlays the northern portion of the Region, while both the County and RCD operate within the entire Region with the exception of lands in the Coyote Creek Watershed that lie within Riverside County (refer to Figure 3-1).

BWD, which was established in 1962, is a water supply and groundwater management agency with the authority to manage the Region's largest water supply source (groundwater). BWD provides water, sewer, flood control, and gnat abatement services for areas in the unincorporated community of Borrego Springs. In 2002, BWD adopted a Groundwater Management Plan in accordance with the Groundwater Management Act (Assembly Bill 3030; Water Code §§ 10750 et seq.) and obtained the authority of a groundwater replenishment district. As a designated groundwater replenishment district, BWD has the authority to conduct planning for groundwater management, to buy and sell water, to exchange water, to distribute water in exchange for ceasing or reducing groundwater extraction, to conduct groundwater recharge activities, and to build necessary works to achieve groundwater replenishment. This designation also provides the authority to levy a replenishment assessment.

The County is involved in water management within the Region through collection of annual groundwater level data and development of land use restrictions that may prevent an increase in aquifer overdraft and reduce flood-related threats to property. In addition, the County has responsibilities regarding flood control within the portions of the Region that lie within the County, and has land use authority within San Diego County lands.

The RCD is involved in water-related management through soil and water conservation and watershed management and restoration activities. The RCD has the authority to promote and provide conservation education, to conduct research, and to advise and assist other public agencies and private individuals in the areas of land use planning, soil and water conservation, wildlife habitat enhancement and restoration, agricultural sustainability, control of exotic plant species, and watershed restoration.

Other Water Managers

In addition to BWD, there are three additional entities within the Region that have water supply authority:

- Canebrake County Water District (CWD),
- Jacumba Community Services District (CSD), and
- Majestic Pines CSD.

Each of these water supply entities supplies water to small unincorporated communities located within the County (refer to Figure 3-1). Canebrake CWD was formed in 1966, and provides potable water (groundwater) to the community of Canebrake, which is located fifteen (15) miles south of Borrego Springs. Jacumba CSD was formed in 1985, and provides potable water supply and park and recreation services to the unincorporated community of Jacumba, which is a federally-designated colonia located adjacent to the United States-Mexico border. Majestic Pines CSD was formed in 1993, and provides potable water to two residential developments located near the community of Julian.

Geographic and Hydrogeographic Setting

The ABD Region is located in the Colorado River Funding Area, which coincides with the Lower Colorado River hydrologic unit. This 850,000-acre Region is almost entirely located in the County of

San Diego, with a small area in southern Riverside County. The Region is bounded on the east by Imperial County; on the south by Mexico; on the west by the Peninsular Range and on the north by Riverside County, except for a portion of the Coyote Creek watershed that extends into Riverside County (refer to Figure 3-1).

The topography of the Region is highly variable and has a major effect on meteorology, hydrology, soils, vegetative communities, wildlife habitat use, and human land use patterns (refer to Figure 3-2). Elevations range from a few feet above mean sea level (AMSL) to over 6,000 feet AMSL in the Peninsular Range. Topography in the Peninsular Range area creates unique habitat niches such as deep canyons on the eastern slopes that support native vegetation, and alluvial fans that extend from the canyon mouths. In addition, topographically enclosed drainage basins containing interior valleys and no outlets are common. The eastern portion of the Region is made up of ancient sea bottom, shoreline, marsh, and inland lake deposits. Mountain masses are scattered throughout the Region and are thought to be related to the Peninsular Range, and made of the same parent rock. The oldest rocks in the Region dating from about 540 million years ago are in the Santa Rosa, San Ysidro, and Coyote Mountains. These metamorphic rocks were originally part of an ancient inland sea bottom and contain fossils of marine life forms that are more than 450 million years old. Most Anza-Borrego fossils range from 6 million to half a million years old and may be the longest continuous record for life during this period in North America (Jefferson and Lindsey 2006).

The Region lies just to the west of the San Andres fault zone and is bisected by two active fault zones, the San Jacinto and the Elsinore faults. The San Jacinto fault runs from the Hemet area through Borrego Valley with branches to the Salton Trough. The Elsinore fault runs from Temecula south along County Road S-2. On April 9, 1968, the largest earthquake in the Region in modern times occurred on the Coyote Canyon fault, a branch of the San Jacinto fault. The epicenter was near Borrego Mountain and the magnitude was 6.4 on the Richter Scale (Remika 1992; Jee 1988).

Annual precipitation is sparse and variable throughout the Region, ranging from 2 to 6 inches at stations on the desert floor. However, occasional torrential rainfall can bring destructive flash flooding. Flash flooding is generally attributed to monsoon-like conditions, which generally occur in the summer and fall months as a result of local thunderstorms and tropical cyclones that develop in the Gulf of Mexico. Flash flooding poses a substantial issue in that it has resulted in severe development restrictions throughout the Region.

The Region experiences mild temperatures in the winter months and hot temperatures in the summer. Measurements taken at the Borrego Desert Park Weather Station show that in a typical year monthly extreme high temperatures reach over 85° F (29° C) as early as March, and are routinely over 100° F (38° C) by May. From June through September, the monthly extreme high temperatures will routinely exceed 110° F (43° C). Not until November will monthly maximum temperatures stay consistently below 100° F.

Water supply to the Region is composed of groundwater that is recharged by runoff from the surrounding mountain watersheds. These flows, primarily from the north (Coyote Creek), recharge the upper aquifer of the Region's groundwater basins along permeable water courses. Groundwater is extracted and utilized throughout the Region from numerous wells. Agencies with water control authority, including BWD, measure their own groundwater extractions; however the majority of groundwater extractions are not measured, and are therefore estimated by indirect methods.

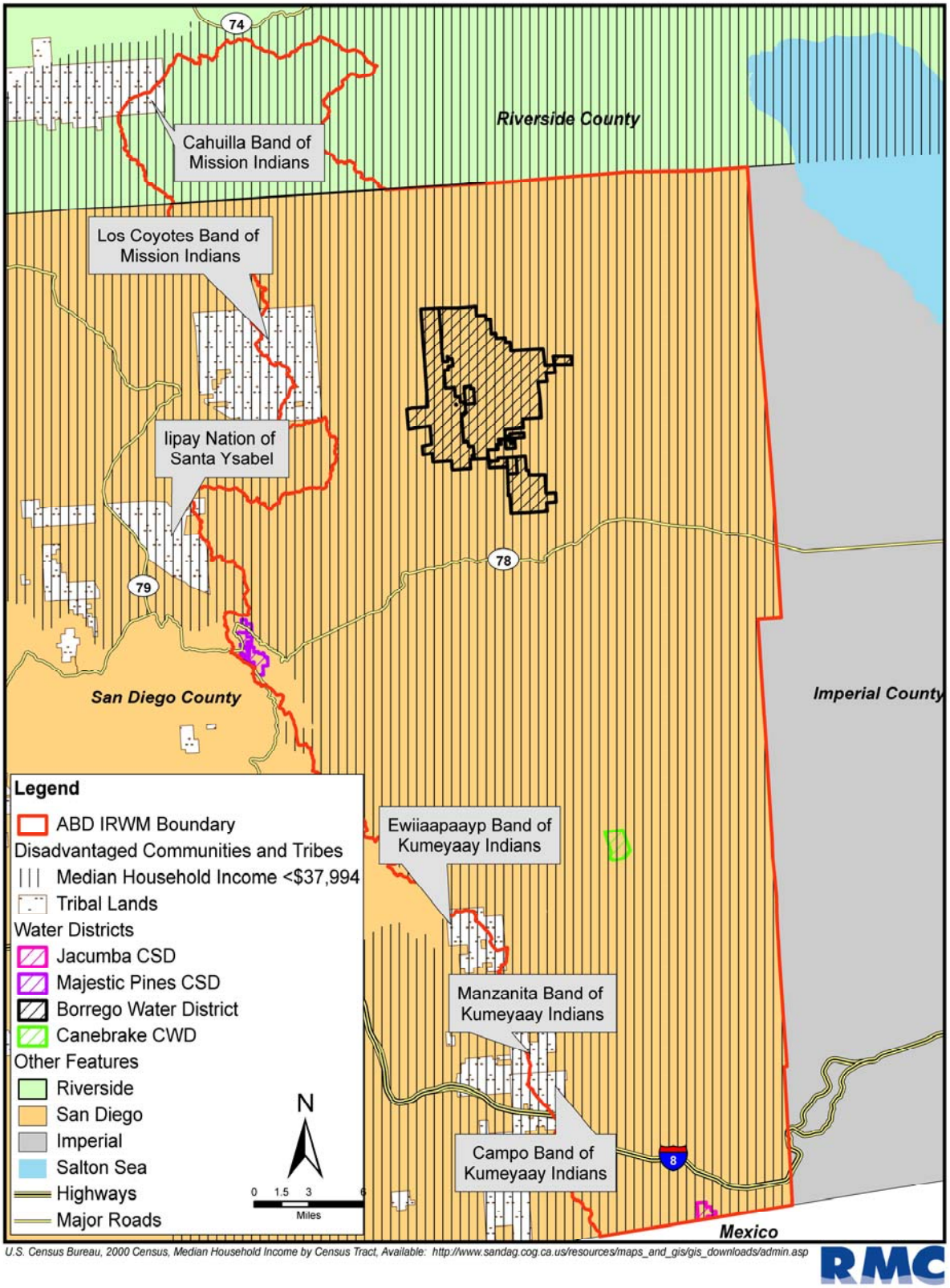
On rare occasions, storm flows in the Borrego Valley are of such a magnitude that they cannot entirely percolate to groundwater basins before reaching an area known as the Borrego Sink, located at the lowest elevation in the Borrego Valley. This depression is typically a dry lake bed, however during very rare events, the Borrego Sink may overflow with water. Such storm flows are often associated with tropical monsoons originating in the Gulf of Mexico.

Regional Demographics

The Region is home to a small number of permanent residents (approximately 3,000); however the Region supports a large amount of tourism, particularly through the use of recreational features of the Anza-Borrego Desert State Park and the Ocotillo Wells State Vehicular Recreation area (SVRA). According to the State Park's General Plan, 600,000 people visit the State Park each year on average, and the annual number of visitors has ranged from 424,000 to 900,000 (Anza-Borrego Desert State Park 2005).

As demonstrated within **Figure 3-3**, almost the entire Region is classified as a DAC according to DWR standards. According to the 2010 DWR Guidelines, a DAC is classified as, "a community with an annual median household income (MHI) that is less than 80 percent of the Statewide annual median household income." Based on the most recent geographic data available for the Region (2000 Census data), the MHI for California is $47,493. As such, those communities with incomes less than 80% of this value, or $37,994, qualify as DACs.

Figure 3-3: Disadvantaged Communities and Tribal Land within the ABD Region



In addition, **Figure 3-3** demonstrates that the Region also contains small amounts of tribal land from six separate tribal entities, including the following tribes:

- Cahuilla Band of Mission Indians,
- Los Coyotes Band of Mission Indians,
- Iipay Nation of Santa Ysabel,
- Ewiiaapaayp Band of Kumeyaay Indians,
- Manzanita Band of Kumeyaay Indians, and
- Campo Band of Kumeyaay Indians.

History of Water Management Efforts in the Region

The Region's primary groundwater basin (the Borrego Valley Groundwater Basin), which supplies water to the majority of the Region's residents, has been known to be in a state of overdraft for many years, most likely since 1945. In the past few decades, the Borrego Valley's water demands have increased, therefore increasing the magnitude of the area's overdraft condition.

Over the last few decades, local residents and other interests within the Borrego Valley have expressed growing concern regarding the lowering of the area's groundwater table and the fact that the Region did not have a plan or regulatory agency with the authority to adequately address regional groundwater overdraft. As a result, in 2000, BWD initiated the process of becoming a Groundwater Management Agency in accordance with the Groundwater Management Act.

BWD's 2002 Groundwater Management Plan (GWMP) successfully established BWD as the designated AB3030 groundwater management agency for the Borrego Valley Groundwater Basin. However, as of today this groundwater basin remains an unmanaged basin, as the statutory provisions of the Act do not appear to provide adequate authority for establishing a managed basin in this situation nor a cost-effective means to collect water extraction fees. For these reasons, BWD has previously attempted to address the overdraft through voluntary measures paid for primarily by BWD's ratepayers, although these ratepayers account for only approximately 10% of annual withdrawals from the basin. Thus, since 2002, although there has been concerted effort by Borrego Valley stakeholders to comprehensively address and manage the area's groundwater resources, the authority and funding mechanism has not been in place to establish managed groundwater basins, presently considered a necessary criteria for water banking, importing replenishment water, and obtaining the financing for building water transport pipelines to accomplish these purposes.

The impetus for beginning IRWM planning in the Region was to gather a comprehensive group of agencies, stakeholders, and citizens that could work toward developing an IRWM Plan that would assist the Region in resolving regional issues such as groundwater overdraft, groundwater quality, flood control, and environmental integrity.

Summary of IRWM Planning Efforts

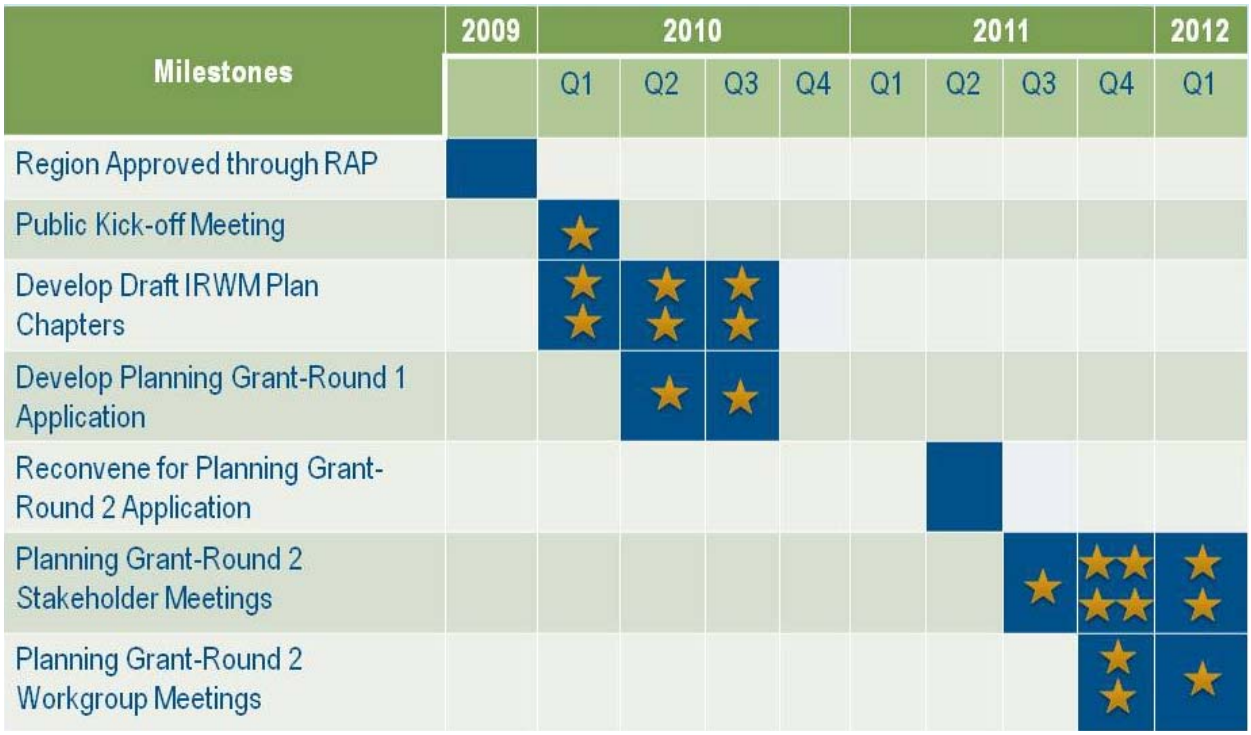
The following sections provide information regarding previous IRWM planning efforts that have occurred in the Region from the Public Kickoff in early 2010 to present.

Meeting Summary

A Public Kickoff meeting was held in January 2010 to initiate the Region's IRWM planning process. Following this meeting, the RWMG and IRWM stakeholders (Stakeholders Committee) worked through September 2010 to begin development of a Draft IRWM Plan and prepare and submit a Planning Grant-Round 1 Application to DWR. During this timeframe, the RWMG and the Stakeholders Committee met on a regular basis, with meetings occurring approximately once per month.

Upon receipt of information that the Region was not recommended for Planning Grant-Round 1 funding, the RWMG reconvened to begin development of a Planning Grant-Round 2 Application. The RWMG decided to increase stakeholder involvement and transparency in development of Planning Grant Application materials by inviting all regional stakeholders to meetings and working collaboratively to establish the overall goals and focus of the IRWM planning process. Through this process, the RWMG convened seven (7) meetings (open to all stakeholders) from July 2011 to March 2012 to develop Planning Grant-Round 2 Application materials. In addition, a Work Plan Workgroup comprised of interested stakeholders was convened through three (3) conference calls and multiple e-mail correspondences to develop a draft Work Plan for the Planning Grant-Round 2 Application. The draft Work Plan, all completed attachments, and other materials included within the final Planning Grant Proposal were vetted through the Stakeholders Committee. **Figure 3-4** provides a graphical representation of the past timeline of the IRWM Program.

Figure 3-4: IRWM Timeline



Past and Current Outreach Efforts

In 2010 and 2011, the RWMG led by BWD initiated a stakeholder outreach process to help support development and adoption of an IRWM Plan. As part of the stakeholder outreach process, the Stakeholders Committee met on October 11, 2011 and completed an exercise to identify all potential stakeholders within the Region. **Table 3-1** below provides a list of identified stakeholders.

Table 3-1: Identified ABD Stakeholders[1]

Agricultural Interests (Agricultural Alliance for Water and Resource Education)	Jacumba Community Services District
Anza-Borrego Desert State Park	Lodging Interests*
Anza-Borrego Foundation	Ocotillo Wells State Vehicular Recreation Area
Borrego Water District	Outlying Community: Boulevard
Borrego Chamber of Commerce	Outlying Community: Canebrake
Borrego Community Sponsor Group	Outlying Community: Jacumba
Borrego Springs Unified School District	Outlying Community: Ocotillo Wells
Cahuilla Band of Mission Indians	Outlying Community: Shelter Valley
Campo Band of Kumeyaay Indians	Homeowners Associations
Canebrake County Water District	Los Coyotes Band of Mission Indians
Commercial Development*	Majestic Pines Community Services District
County of San Diego	Manzanita Band of Kumeyaay Indians
Elsinore-Murrieta-Anza Resource Conservation District	Residential Development*
Ewiiaapaayp Band of Mission Indians	*Resource Conservation District of Greater San Diego County*
*Golf Course Interests**	RV Park Interests*
Iipay Nation of Santa Ysabel	*Salton Community Service District*

[1] Those stakeholders identified in italics currently participate on the Stakeholders Committee.

*It was noted that these groups do not have a cohesive group of aligned interests at this time.

In order to facilitate a robust stakeholder process, the DWR Regional Service Representative requested that DWR, through a separate contract with the Center for Collaborative Policy (CCP), provide facilitation services to the ABD IRWM stakeholders. Please note that because this work is being completed through DWR, this work is not included within the overall Budget (refer to Attachment 4). Additionally, this effort captured a limited number of preliminary meetings and stakeholder contacts; as such, ongoing outreach is needed and included in Task 1 of this Work Plan.

The request, granted by DWR Southern Region Office, included a scope of work with two phases. During Phase 1, CCP conducted interviews of potential stakeholders in the Region to determine the feasibility of providing facilitation services in support of an ABD IRWM Plan. Questions included:

1. Will stakeholders from the key organizations in the Region participate in IRWM planning in order to make it a legitimate process?
2. What are the main water issues and challenges that need to be addressed in the IRWM Plan?
3. Will the region be successful in addressing those issues in spite of obstacles that might derail development of the IRWM Plan?

In addition, RMC-WRIME, through a separate contract with DWR, would take part in the relevant interviews and conduct additional research to ascertain the status of technical information, determine technical needs, and determine the feasibility of providing technical support to assist in the drafting of the ABD IRWM Plan.

The summary report produced by CCP following the stakeholder interviews determined that a robust stakeholder process that supports IRWM planning is feasible. The summary report resulted in four (4) major recommendations for the ABD Region. The questions (*presented in italics*) and their relative recommendations and/or results (**presented in bold**) are summarized below:

- *Is it possible for the ABD IRWM Region to convene a group of stakeholders representing appropriate agencies, interest groups, and businesses to draft an IRWM Plan for the region?*

  Stakeholder interviews confirmed that stakeholders are potentially committed to participating in the preparation of the ABD IRWM Plan, including ABD State Park, agriculture interests, golf interests, business interests, and non-governmental organizations. **An effort should be made to identify other possible stakeholders and include them in the IRWM planning process as they may have timely issues that also need to be addressed.**

- *Is it reasonable to assume that the stakeholders will work together toward the goal of producing a viable IRWM Plan?*

  While some interviewees noted that it may be challenging to get stakeholders to communicate with each other and work together toward a common goal, most interviewees expressed optimism that in spite of the differences of opinion, stakeholders can work together and compile a successful IRWM Plan. **This process will likely require education of the public about regional water issues, and some facilitation during solution-seeking processes.**

- *Is it economically feasible for DWR to provide facilitation from CCP for the Borrego IRWM Plan development effort?*

  Yes, however due to distance and travel time associated with attending meetings in the Borrego IRWM Region, it is recommended that contracts include cost-saving provisions.

- *Is it feasible for a consultant team to conduct additional research to ascertain the status of technical information, determine technical needs, and provide technical support to assist in developing the ABD IRWM Plan?*

  Yes, it is feasible to conduct additional research; however there are recommended steps to expedite this process:

  - Collect available technical data and information about the Borrego Valley Groundwater Basin and other regional groundwater basins.
  - Review existing literature and information.
  - Develop an impartial understanding of the state of the region's groundwater basins from a scientific perspective.
  - Identify and describe gaps in the data, information, and analysis.
  - Work with stakeholder representatives to develop a consensus on the scale of Region's groundwater issues and the state of the Region's basins.
  - Develop a work plan that identifies potential options to address identified issues.

Based on the recommendations presented above, DWR is pursuing Phase 2, also through a separate contract with CCP, to continue to facilitate stakeholder meetings and help engage stakeholders during the

development of the ABD IRWM Plan. *Additional IRWM Plan Work*, below, provides further discussion of the planned scope of work for Phase 2.

Governance Structure

The ABD Region strives to maintain transparency in all IRWM-related activities, and therefore has an organizational (governance) structure that functions as a "bottom-up" process where stakeholders feed information and input up through the RWMG, who is responsible for considering stakeholder input when making informed decisions for the Region. **Figure 3-5** below provides a graphical representation of the Region's existing bottom-up governance structure.

Figure 3-5: Existing Bottom-Up Governance Structure

Regional Water Management Issues

In October 2011, stakeholders participated in an exercise with a professional facilitator from CCP through which they identified "big" (key) issues within the Region. During this process, stakeholders unanimously identified four key issues:

1. water supply,
2. water quality,
3. flood control, and
4. environmental integrity.

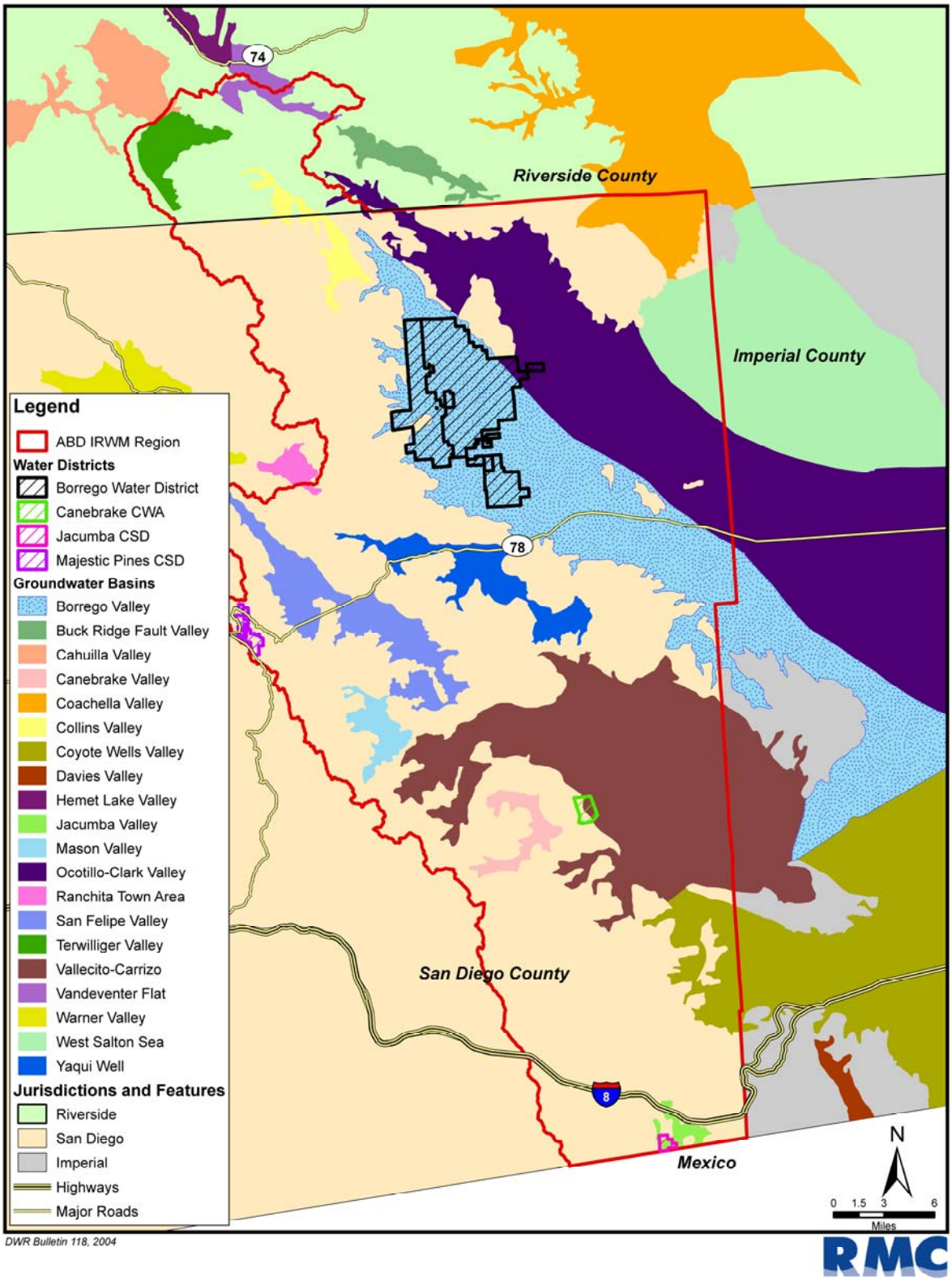
Stakeholders unanimously identified water supply as the Region's most important issue among the four identified key issues. While the issue of environmental integrity was not formally defined within this process, stakeholders agreed that due to the importance of the State Park to the Region, water-related issues potentially affecting the natural environment (particularly within the State Park) should be considered.

The following includes an overview of each of the four regional issues identified by stakeholders. Background information is also provided regarding climate change, which is an emerging issue not previously adddressed within the region and included in the scope of this Work Plan.

Water Supply

Usable water supply within the Region is solely sourced from groundwater basins. Within the Region, runoff from surrounding mountain watersheds recharges local groundwater basins, which are then accessed from multiple locations via pumping. There are many groundwater aquifers within the Region; however the Borrego Valley Groundwater Basin (Basin 7-24 per DWR Bulletin 118) supplies water to the majority of the Region's residents (refer to **Figure 3-6**). The Borrego Valley Groundwater Basin is composed of three distinct aquifers: the Upper, Middle, and Lower aquifers.

Figure 3-6: Groundwater Basins within the ABD IRWM Region



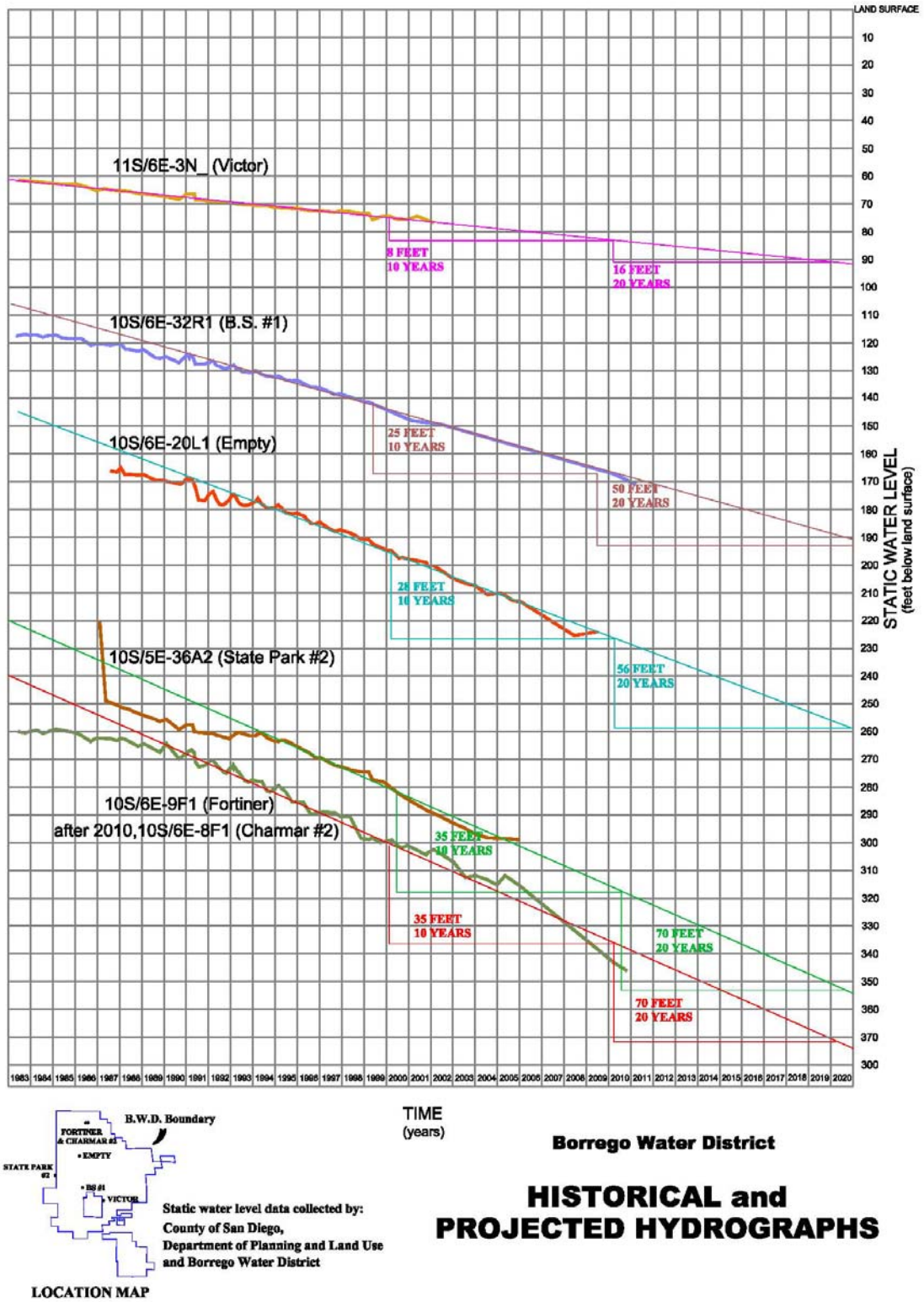
Despite the potentially dire situation of the Region's main water supply source, the Region has not yet reached consensus regarding the status of the Region's groundwater basins.

The Region's groundwater basins, particularly the Borrego Valley Groundwater Basin, are in a state of overdraft. According to the County of San Diego General Plan Update, the estimated usable life of the Upper Aquifer of the Borrego Valley Groundwater Basin under existing conditions is approximately 50 to 100 years (County of San Diego 2011). Stakeholders within the region have concerns about this useful life of the aquifer. According to recent modeling by the U.S. Geological Survey (USGS), if present overdraft levels continue unabated there may be only 50-years until the Upper Aquifer is dewatered. There is concern groundwater availability and quality may deem the Borrego Valley's lower groundwater aquifers unusable from an economic standpoint.

Available groundwater within the Borrego Valley Groundwater Basin is currently sourced mainly from the Upper Aquifer (County of San Diego 2010). Hydrogeological information regarding the Borrego Valley Groundwater Basin suggests that it is not known at this time whether it is economically viable to pump groundwater from the Middle and Lower aquifers due to their depth and the quality of groundwater that can be obtained on a continuous basis. For example, if groundwater from this depth contains large amounts of fluorides or other contaminants, expensive tertiary treatment may be required for all purposes, including irrigation and municipal uses (County of San Diego 2010). Due to the fact that groundwater does not currently require this level of treatment, the Borrego Valley would be required to install costly treatment facilities that would substantially increase the cost of local water supply. In addition, pumping from lower depths would likely increase pumping costs by a substantial amount. Given that almost the entire Region qualifies as a DAC, it is unlikely that it would be economically viable for Borrego Valley pumpers to rely on groundwater that requires high levels of treatment or requires a substantial increase in pumping costs. Therefore, although groundwater exists within the Middle and Lower Aquifers of the Borrego Valley's groundwater basins, there is substantial and justified concern throughout the Region that this water may not be viable from a technical or economic perspective. Since groundwater within the Upper Aquifer is likely the most economically and technically feasible existing water resource for the area, it is imperative that this water resource is appropriately and sustainably managed now, especially given that this resource likely has less than 50 years of availability at current withdrawal rates according to the most recent USGS work (see Task 2.1 below).

Figure 3-7 provides historical and projected hydrographs of the Borrego Valley Groundwater Basin from 1983 to 2020. This graphic demonstrates past and potential future declines in local groundwater levels within various sampling points throughout the basin.

Figure 3-7: Historical and Projected Hydrographs of the Borrego Valley Groundwater Basin



Despite the importance of groundwater supplies and the potentially dire situation of the Region's main water supply source (the Borrego Valley Groundwater Basin), the Region has not yet reached consensus regarding the current and future status of the groundwater basins.

DWR has also recently initiated, through its Southern Region Office and a separate contract with RMC-WRIME, development of the *ABD Region Summary*. This effort will analyze existing information about the Region's groundwater basins to document the past, present, and range of foreseeable future conditions within the local groundwater basins (Borrego Valley Groundwater Basin and outlying basins). Through a stakeholder-driven process, the *ABD Region Summary* will help achieve consensus among the Region's stakeholders regarding current and future projected land use assumptions, water demands, and groundwater basin characteristics. As the *ABD Region Summary* will rely on existing information, it will compile known data regarding the existing groundwater supply and demand, given that information regarding these parameters is available and agreed upon by stakeholders. As such, this effort will produce a common understanding of the existing status of the Region's groundwater basins, and will not produce future modeling of groundwater levels or groundwater quality. *Additional IRWM Plan Work*, below, provides further discussion of the planned scope of work for the *ABD Region Summary*.

While the *ABD Region Summary* and other ongoing groundwater planning efforts will provide useful groundwater management data, they do not include development of alternatives that could be implemented to ensure groundwater is sustainably managed within the Borrego Valley. As such, work included within this Work Plan (refer to **Task 2-1 and Task 2-2 of this Work Plan**) aims to fill this gap and move the area towards developing alternatives that can be implemented to achieve sustainable groundwater management.

Water Quality

As described above, the Region's groundwater basins, in particular the Borrego Valley Groundwater Basin, are in a state of overdraft. As the Region's groundwater basins are dewatered (under existing conditions), it is possible that water quality issues will arise. According to Bulletin 118 from DWR, the Borrego Valley Groundwater Basin is currently impacted by total dissolved solids (TDS) and also potentially by nitrates (DWR 2004). Nitrate is regulated as a primary contaminant by both federal and state agencies, and can have significant human health effects. Nitrate contamination of the groundwater has been noted in some wells within the ABD region. The sources of these nitrates are most likely anthropogenic as high nitrate concentrations are not "naturally occurring" in the groundwater of the Region's basins. (Mueller & Helsel, 1996; USGS, 2000).

Information from local stakeholders suggests that nitrates, inorganic compounds, and other byproducts may exist at high concentrations within certain portions of the groundwater basins. This information is supported by multiple instances of groundwater wells being taken offline, particularly due to issues involving high nitrate concentrations. Therefore, there is concern that as the Region's groundwater basins become dewatered, water quality conditions will change, and a greater amount of the Region's groundwater supply will be impacted by water quality issues. Given that the Borrego Valley's existing groundwater from municipal water wells used to supply potable water does not exceed maximum contaminant levels set by regulators, if water quality issues were to arise, they would potentially require that BWD and/or other pumpers implement costly water treatment systems that are not currently in place. As such, water quality impacts could have a substantial economic impact within the area, by potentially rendering groundwater prohibitively expensive depending on the level of water treatment required. This concern is especially serious given the economic demographics of the Region and the fact that the majority of the Region qualifies as a DAC.

Therefore, this Work Plan contains activities that will lead the Region towards a better understanding of groundwater quality by assessing how water quality may change as the Region's groundwater basins are dewatered (refer to **Task 2-3 of this Work Plan**).

Flooding

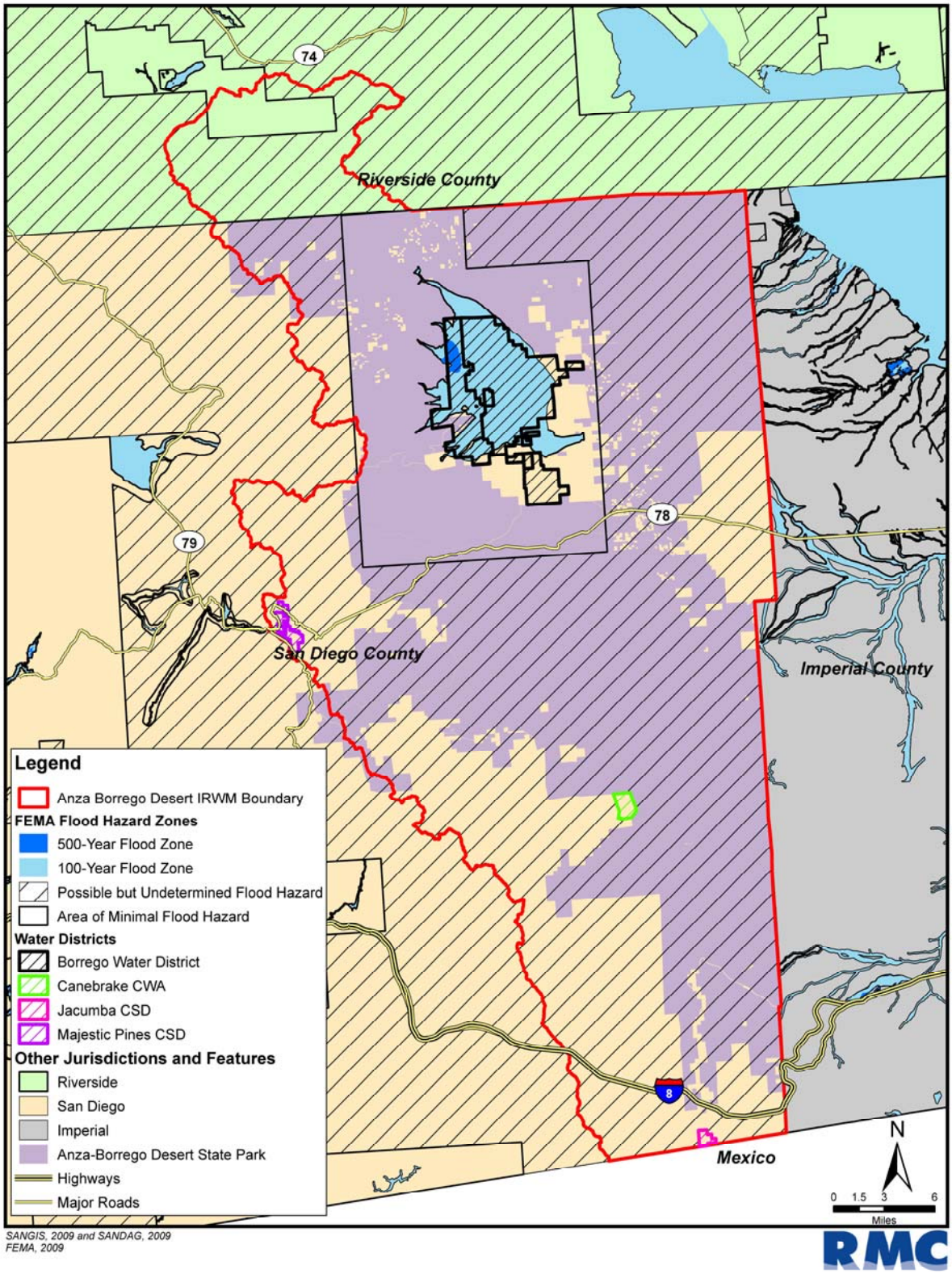
In October 2011, stakeholders identified flood control as a key issue throughout the Region. The Borrego Valley in particular contains seven major alluvial fans and has experienced repetitive flooding over the years. An alluvial fan is a geologic feature where a fan-shaped mass of mud and debris is deposited from the sudden slowing of flood waters from a steep valley onto a flat plain. The flooding associated with alluvial fans can be very hazardous and has historically been associated with significant property damage and loss of life. According to the National Weather Service, during a September storm in 2004, a wall of mud 8 -10 feet high and 150 yards wide travelled through Borrego Palm Canyon. Over the years, there have been major flooding events on the alluvial fans within Borrego Valley causing millions of dollars of damages.

The County of San Diego is constantly striving to increase public safety in the area and reduce the potential for future losses from flood events which will occur. Stakeholders, however, have noted that flood-based development restrictions have harmed the Region's economy, because the County of San Diego currently restricts development in certain portions of the Region that have mapped flood risks according to the Federal Emergency Management Agency (FEMA). As such, there is an economic impetus for implementing flood control measures, because such measures may alleviate development restrictions and provide benefits to the Region's economy (refer to **Figure 3-8** for an overview of the current flood areas mapped by FEMA). The purpose of flood-related development restrictions is to avoid damages to structures and property during flood events, which has been a substantial issue in the Region. For example, a 2010 study conducted by the United States Army Corps of Engineers (USACE) indicates that the total damage incurred to the Borrego Springs area alone due to a 100-year flood event is over $29 million (USACE 2010).

Within the Borrego Valley, the County of San Diego is initiating a delineation process to alleviate some of the development restrictions. Once complete, it will begin drafting guidance to help explain the applicable requirements. This process will need to be coordinated with the flood management aspects of the IRWM Plan as a part of **Task 2-4.1 of this Work Plan**.

Meanwhile, the rest of the Region has not undertaken either a Region-wide survey of flooding issues or conducted an analysis of potential alternatives that could be developed to alleviate flood issues. Therefore, **Task 2-4.2 of this Work Plan** includes analysis that will assess adaptation strategies that will manage flood risks, both under current conditions and specifically as it relates to climate change.

Figure 3-8: Currently Mapped Flood Areas according to FEMA



Environmental Integrity

"Environmental integrity" embraces the concept that the Region and its vast array of environmental resources must be protected by ensuring their sustainability. Sustainable water use does not harm ecosystems, degrade water quality, or compromise the ability of future generations to meet their own needs.

Information from the County indicates that groundwater overdraft, flooding, and other water management issues have resulted in environmental integrity issues in the Region. Specifically, overdraft of the Borrego Valley Groundwater Basin, in conjunction with recent droughts, has caused substantial loss to important biological resources such as sensitive plant and animal species within the State Park (County of San Diego 2011). Specifically, information from the Anza-Borrego Desert State Park demonstrates that the decline of Mesquite Bosque Habitat is positively correlated to the reduction of groundwater levels (Anza-Borrego Desert State Park 2005). If the Region's groundwater basins continue to be dewatered and lose viability, it is possible that biological resources, such as those within the State Park will continue to be impacted. Furthermore, if groundwater overdraft were to impact groundwater quality, biological resources and other environmental resources within the Region could be further impacted. In addition, stakeholders have indicated that flooding has the potential to damage the environmental integrity of the Region through erosion and siltation that impact the Region's ecosystems. Such environmental integrity issues could result in potentially large adverse economic impacts to the considerable annual revenues generated for the Region from tourists visiting the State Park and frequenting the resorts and winter homes in the region.

Due to the importance of environmental integrity and the nexus between this issue and the other key issues (water supply, water quality, and flooding), **Tasks 2-2, 2-3, and 2-4 in this Work Plan** have components (specific subtasks) that address this issue.

Climate Change

DWR's IRWM Grant Program Guidelines, which will guide development of the ABD IRWM Plan, contain specific and substantial requirements regarding climate change. Specifically, DWR requires that IRWM plans address both adaptation to the effects of climate change and mitigation of greenhouse gas emissions. While many generalized climate change studies have been completed throughout the State of California, no climate change vulnerability analyses or other specific climate change analyses have been completed for the Region.

Due to the Region's reliance on groundwater supplies, climate change analyses will need to assess potential climate change-related impacts to this critical regional resource. A 2010 paper written by scientists from the Massachusetts Institute of Technology indicates that climate change is anticipated to impact annual recharge rates, which would therefore impact the Region's water balance and potentially reduce the usable lifetime of the Borrego Valley Groundwater Basin (Gene-Hua et al 2010).

In addition, an existing report from DWR entitled *Water and Border Area Climate Change – An Introduction* provides an overview of potential impacts that may arise within the United States-Mexico Border Region (within which the ABD Region lies) as a result of climate change (DWR 2008). This report indicates that monsoons originating in the Gulf of Mexico, which currently cause flash flooding within the Region, could intensify with climate change (DWR 2008).

Also, climate models are in general agreement that the air temperature will continue to increase by as much as 3 ºC by 2100 in the southwestern United States in response to increases in greenhouse gasses (Earman and Dettinger, 2007) and they typically predict overall drying trends in the desert areas of the southwestern United States (Seager et. al, 2007). Increased air temperature will increase rates of evaporation resulting in decreased stream flows by lowering contributions from runoff and groundwater

sources. In addition, increased air temperature will increase the potential evapotranspiration, which likely will increase water demands, further stressing the limited water resources in this region.

Due to the potential impact that climate change may have on issues already identified as important within the Region (water supply and flooding), **Task 3-4 in this Work Plan** includes a climate change analysis which will assess Region-specific climate change vulnerabilities and consider adaptation strategies that may be adopted to address such vulnerabilities.

2. Current Status in Meeting IRWM Plan Standards

As described previously, the ABD IRWM planning process was initiated by the RWMG in January 2010 via a Public Kickoff meeting. Subsequent to that, all interested participants were organized into a Stakeholders Committee. Monthly meetings of both the RWMG and the Stakeholders Committee were immediately initiated and work began on developing an IRWM Plan. As of August 2011, portions of the IRWM Plan have been completed in draft form.

While the Draft IRWM Plan provides a substantial starting point, it was not completed, finalized, or adopted by the RWMG agencies or the Stakeholders Committee. These groups have determined that additional work, in addition to increased stakeholder and public outreach, and revisions to the Draft IRWM Plan are needed prior to adoption. In addition, the IRWM Plan must be updated in compliance with DWR's IRWM Grant Program Guidelines in order to be eligible for future rounds of Proposition 84 or Proposition 1E grant funding. As such, this Work Plan includes the tasks necessary to complete an IRWM Plan that is compliant with current DWR standards, and approved by the RWMG and the Stakeholders Committee.

The IRWM Grant Program Guidelines include sixteen (16) specific standards that must be met by the IRWM Plan. **Table 3-2** provides a summary of revisions that need to be made to the existing Draft IRWM Plan to meet standards set within the Guidelines. In addition, Table 3-2 provides information regarding whether or not given revisions or work will be covered by funds requested as part of this Planning Grant Proposal. Any necessary work not contained within the *Grant Work Plan* is described in within *Additional IRWM Plan Work.*

Table 3-2: Revisions Needed for the IRWM Plan

IRWM Plan Sections (DWR 2010)	Draft IRWM Plan Section (2010)	Revisions and Work Needed	Work Plan Task Addressing IRWM Plan Section	Covered by DWR Planning Grant?
Governance	Section 1, Governance	Expand discussion of governance structure, public noticing, Plan adoption, decision-making, and collaborative process	Task 1, Task 3-1	Partially
Region Description	Section 2, Description of Region	Refine description of regional description based on new/updated information about the Region	Task 1, Task 2, Task 3-6	Partially
Objectives	Section 3, Goals, Objectives, and Targets	Expand discussion of process used to determine objectives	Task 3-2	Yes
Resource Management Strategies	Section 4, Resource Management Strategies Identification and Integration	Expand discussion of process used to identify resource management strategies for IRWM Plan	Task 3-6	Yes
Integration	Section 4, Resource Management Strategies Identification and Integration	Expand discussion of stakeholder/institutional and project integration	Task 1, Task 3-6	Yes
Project Review Process	Section 5, Project Review Process	Expand discussion of project submittal, funding application prioritization, and modification	Task 3-2	Yes
Impact and Benefit	Section 6, Impact and Benefits	Expand discussion of the impacts and benefits of program implementation	Task 3-6	Yes
Plan Performance and Monitoring	Not completed	Determine discussion of methods to evaluation Plan performance	Task 3-4	Yes
Data Management	Not completed	Determine the IRWM data management system	Task 3-3	Yes
Finance	Not completed	Evaluate potential sources and certainty of funding	Task 3-1	Yes
Technical Analysis	Not completed	New discussion of technical information, analysis, and methods	Task 3-3	Yes
Relation to Local Water Planning	Not completed	New discussion of relation to local water and flood management planning	Task 3-5	Yes
Relation to Local Land Use Planning	N/A	New discussion of relation to local land use planning, relationships between water managers and planners, and proactive efforts to improve relationships	Task 3-5	Yes
Stakeholder Involvement	Section 2, Description of Region	Expand discussion of process used to engage stakeholders and DACs, decision-making process, and information access	Task 1, Task 2, Task 3 (all subtasks)	Partially
Coordination	Section 2, Description of Region	Expand discussion of coordination with State and federal agencies, as well as interregional IRWM partners	Task 1, Task 2, Task 3 (all subtasks)	Yes
Climate Change	N/A	New discussion of climate change, anticipated implications and effects, and mitigation opportunities	Task 2-3, Task 3-6	Yes

3. Grant Work Plan

Task 1: Stakeholder Outreach & Program Administration

Task 1-1: Stakeholder Outreach (Including DACs and Tribes)

Establishing a common understanding and support for the IRWM Plan among key stakeholders is critical to the success of the ongoing program. As the program moves forward, it will be important to do what is possible to increase stakeholder engagement through increased attendance and participation in stakeholders meetings. It will be especially important to increase outreach to stakeholders that have been previously contacted, but have not yet officially participated in the IRWM program or the Stakeholders Committee.

The following are specific subtasks that will be completed as part of Task 1-1:

Subtask 1-1.1: Increase and Sustain Stakeholder Involvement

Stakeholder outreach will continue to involve announcing and posting agendas, minutes, and other items of the stakeholder meetings on the BWD website. Additionally, all meetings and materials will continue to be sent to the IRWM stakeholder email distribution list. Following are specific ongoing outreach activities that will take place in support of the IRWM program process and IRWM Plan implementation.

The RWMG will conduct follow-up activities to the stakeholder outreach that has been completed to date. Specifically, the RWMG will hold up to six (6) public workshops throughout development and completion of the IRWM Plan. These meetings will coincide with IRWM Plan milestones, and will be held at various locations throughout the Region. The workshops are intended to reach out to and solicit input from stakeholders and organizations that are not able to participate in regular Stakeholders Committee meetings. The workshops will be held throughout the Region as appropriate, and will be held at times best suited to obtain maximum stakeholder involvement. Emphasis will be placed on receiving input from stakeholders rather than solely educating participants about the IRWM program. Two (2) of these workshops will be specifically directed toward receiving input on the Public Draft IRWM Plan.

In addition, this task will include activities such as contacting stakeholders by phone and by email to notify them about upcoming IRWM activities and solicit participation in public workshops. In addition, existing stakeholder outreach being conducted by CCP will produce directed outreach strategies that the Region can employ to increase stakeholder involvement. While these specific outreach strategies have not yet been identified, it is anticipated that they will include refining the existing stakeholder list and presenting IRWM-related materials at community organization meetings. In addition, directed outreach will include producing up to six (6) newsletters that can be distributed electronically and in-person at meetings, and development of periodic press releases that will be sent to local news publications such as the Borrego Sun, Anza-Borrego State Park Magazine, Julian News, High Country Journal, and other local news sources to notify community members about upcoming public workshops on IRWM planning topics. The purpose of these stakeholder outreach efforts is to support sustained stakeholder participation throughout development of the Public Draft IRWM Plan.

Subtask 1-1.2: Increase and Sustain Involvement from DAC and Tribal Entities

Specific targeted outreach efforts will also be conducted to groups and individuals representing DAC and tribal interests. Outreach efforts will include contacting identified DAC and tribal stakeholders by phone and by email to notify such stakeholders about upcoming IRWM activities and solicit participation in public workshops. Outreach efforts will also include refining the existing list of DAC and tribal contacts to ensure that all interested DAC and tribal communities and their representatives are included. Outreach will also include up to four (4) meetings to be held in DAC or tribal areas; these meetings will be structured to facilitate direct coordination with DAC and tribal entities to identify their major water-related issues and priorities. These meetings will result in the development of text that will be

incorporated into the IRWM Plan to characterize DAC and tribal communities and their water management needs.

Those representing DACs within the Region have expressed that they lack the resources or technical capacity to develop project submittals that address those critical needs. Without support, their participation in the IRWM process may wane over time. As such, the RWMG will work with those project sponsors to develop project scopes, budgets, and cost estimates to help ensure the DAC projects can be included in the IRWM Plan Update and future funding applications. This support includes planning and engineering services to achieve conceptual-level drawings, schematics, and cost estimates for up to 4 projects necessary to meet critical DAC needs. This effort will provide complete project information, but will not include CEQA or permitting efforts.

Lastly, development of the IRWM Plan and other ABD IRWM-related activities involve a Stakeholders Committee that is discussed in detail in Task 1-2. Due to the importance of DAC and tribal communities within the Region, directed outreach via telephone calls and e-mails, will be conducted prior to Stakeholders Committee meetings to encourage participation among DAC and tribal representatives.

Other Studies or Work Products to be Utilized

- Work completed by CCP under DWR's Facilitation and Technical Support Contract (see *Additional IRWM Plan Work)*.

Deliverables

- Refined electronic distribution list, specifically updated with DAC and tribal entities, with contact phone numbers to provide for follow-up communication;
- Up to six (6) public workshops on IRWM planning topics, including agendas, presentations, handouts, and notes. Two (2) of these public workshops will be directed toward receiving input on the Public Draft IRWM Plan document.
- Periodic updates of the IRWM website (hosted on BWD's website);
- Up to six (6) newsletters that will be provided to stakeholders to update them on the IRWM Planning Process;
- Periodic press releases submitted to the Borrego Sun and other local news sources as appropriate;
- Identification and implementation of directed outreach strategies such as presentations and outreach at community organization meetings;
- Up to four (4) conceptual planning documents for projects addressing critical DAC needs.
- Up to four (4) DAC and tribal outreach meetings, including agendas, presentations, handouts, and notes; and
- Draft and final IRWM Plan section articulating DAC and Tribal water-related issues and their respective water management needs.

Task 1-2: RWMG / Stakeholders Committee Meetings (Including DACs and Tribes)

As stated above, the RWMG for the ABD Region is comprised of BWD, the County, and the RCD. These entities will continue meeting on a regular basis throughout development of the IRWM Plan. In addition, the Stakeholders Committee, which is currently open to all interested stakeholders, is an important component of the IRWM planning effort as they provide input directly to the RWMG (refer to Figure 3-5). The Stakeholders Committee will continue to meet on a regular basis throughout development of the IRWM Plan, and will discuss specific IRWM-related topics such as deliverables associated with the Regional Water Resources Plans (refer to Task 2) and the ABD IRWM Plan (refer to Task 3). The purpose of this task is to maintain agency and stakeholder involvement to uphold the Region's current and anticipated future governance structure.

The following are specific subtasks that will be completed as part of Task 1-2:

Subtask 1-2.1: RWMG Meetings

The RWMG is responsible for ongoing management of the IRWM program. The RWMG will meet on an approximately monthly basis. These meetings will generally occur via conference calls. These meetings are critical to maintaining ongoing communication among RWMG members throughout the implementation of Stakeholder Outreach (Task 1-1), and development of the Regional Water Resources Plans (Task 2), and of the IRWM Plan Update (Task 3). A majority of the RWMG meetings will involve IRWM Plan development and outreach activities. These meetings will be the primary opportunity for the RWMG agencies to provide in-kind contributions and assistance to the development of the IRWM Plan and related efforts. This task will involve continued support of the RWMG meetings, including preparation for, facilitation of, and participation in monthly RWMG meetings.

Subtask 1-2.2: Stakeholders Committee Meetings including DACs and Tribes

Due to the importance of continuing participation and information sharing with regional stakeholders, Stakeholders Committee meetings will be held on a monthly or bi-monthly (every other month) basis throughout the time frame of IRWM Plan development (from 2012 - 2014). Despite the presence of DACs and tribal groups within the Region, the Stakeholders Committee does not currently contain members that represent specific DAC or tribal interests. Therefore, as described under Task 1-1, work will be conducted to increase DAC and tribal participation in Stakeholders Committee meetings. As part of these efforts, the RWMG will work with DAC and tribal entities to schedule Stakeholders Committee meetings, and will hold meetings in locations preferable to these groups as practical.

Half of the Stakeholders Committee meetings will take place in person, and half will be held via conference call and/or webinar. The in-person meetings will be held at the BWD headquarters in Borrego Springs or at alternate locations throughout the Region to accommodate other stakeholders, particularly DAC and tribal representatives. Agendas for these meetings will be prepared and distributed in advance to each person listed on the stakeholders list and on the BWD (IRWM) website. A conference line will be provided so that stakeholders that cannot attend in-person can participate via conference call. As necessary, webinars will be utilized to allow for presentations to occur during conference calls.

Stakeholders Committee meetings will be scheduled to coincide with the development of important IRWM Plan topics including governance and financing, goals, objectives, and priorities, metrics, targets, and reporting process, and the nexus between land use and water planning. As such key topics essential to IRWM planning in the Region are developed, the Stakeholders Committee will be asked to provide input and feedback to the RWMG to ensure that these important topics are vetted through the Region's stakeholders. In addition, the Stakeholders Committee will be asked to review and provide feedback on the Public Review Draft IRWM Plan.

Other Studies or Work Products to be Utilized

- Work completed by CCP under DWR's Facilitation and Technical Support Contract (see *Additional IRWM Plan Work)*.
- Refined electronic distribution list with contact phone numbers to provide for follow-up communication. Please note that the electronic distribution list will be created as part of Task 1-1, and will include specifics regarding DAC and tribal stakeholders.

Deliverables

- Agendas, materials, handouts, and meeting notes for RWMG meetings (up to 24 meetings).
- Agendas, materials, handouts, webinars, and meeting notes for Stakeholders Committee meetings (up to 24 meetings).

Task 1-3: Coordination with other IRWM Regions

This task includes outreach to and coordination with neighboring IRWM regions within the Colorado River Funding Area, as well as neighboring IRWM regions within other funding areas. The goal of this outreach is to establish a coordination meeting that occurs up to three times per year between the four existing regions within the Colorado River Funding Area (Imperial, Coachella Valley, Mojave, and Anza Borrego Desert) to discuss common planning issues, results of regional planning studies, and possibly distribution of the available remaining Proposition 84 funding. In addition, this task will serve to provide a forum for discussing any joint project opportunities and/or project conflicts with neighboring IRWM regions, particularly those within adjacent or overlapping watersheds.

Other Studies or Work Products to be Utilized

- IRWM Plans for neighboring regions, as appropriate.

Deliverables

- Targeted outreach (emails, telephone calls) to neighboring IRWM regions;
- Agendas, materials, and handouts, and meeting notes for Inter-Regional Coordination meetings (up to 6 meetings).

Task 2: Regional Water Resources Plans

Due to the importance of the four key issues within the Region (refer to *Introduction*), it is essential that they are properly addressed and included within the IRWM Plan. Therefore, the following tasks outline regional water resources plans that aim to address each of the four key issues. Water supply (groundwater) is addressed in Task 2-1 and Task 2-2, and water quality (groundwater quality) as it relates to changes in groundwater levels is addressed in Task 2-3. Task 2-4 addresses climate change, which is a substantial component of DWR's Guidelines for IRWM Plans. In addition, because climate change is anticipated to substantially impact flood control and environmental integrity, Task 2-4 also includes specific components that analyze how climate change will impact these key issues. Tasks 2-2 and 2-3 also include components that address environmental integrity as it relates to groundwater supply and groundwater quality.

Key Regional Issues Identified by Stakeholders:

- Water supply;
- Water quality;
- Flood control; and
- Environmental integrity.

Task 2-1: Characterization of Current Regional Water Supply

The USGS and BWD will work together on a planning study that aims to provide an improved understanding of hydrogeology and water availability of the Borrego Valley. Many studies have been completed on groundwater in the Borrego Valley, which have documented long-term groundwater level reductions due to groundwater pumping. The USGS has produced several studies and models on groundwater in the Borrego Valley, the eldest of which is from 1945, and the newest of which is from 1988. Due to the age of the existing USGS studies and models, the fact that conditions have changed in recent decades, and the potentially dire state of groundwater in the Borrego Valley, there is a pressing need to increase understanding of the existing and future projected conditions of this important water supply source.

The *Evaluation of Ground-Water Conditions and Land Subsidence in the Borrego Valley, California,* includes a total of five (5) tasks, which will ultimately result in development of a groundwater flow and land subsidence model. Recent efforts (in 2009-2011) have focused on gathering groundwater and subsidence data that will enhance the ABD IRWM Plan. Further work to be completed as part of this Study (in 2012) will complete model development and preparation of the final report.

The objective of Task 2-1 is to improve the understanding of groundwater conditions and land subsidence in the Borrego Valley and to incorporate that information into the ABD IRWM Plan. This task represents an important first step in managing groundwater within the Borrego Valley, and will lay the foundation for development of a groundwater flow model that will provide a tool to help evaluate and manage the Region's groundwater resources.

In order to facilitate stakeholder input for the model run scenarios developed by USGS as part of the planning study, a Community Advisory Committee was established in October 2011. This committee met over the course of four months to determine a list of possible model run scenarios to submit to the USGS. These scenarios would take into account various possible future water usages based on several components developed by the committee. During this period, the committee interviewed representatives from the Borrego Springs Community Sponsor Group and the Golf Course Association. In addition, the committee received input from members of the agricultural community through a questionnaire that was prepared and distributed to individuals representing agricultural interests. The scenarios picked by the committee are as follows:

- Scenario #1 - No change in water use;
- Scenario #2 - Low population growth with 25% less recreational and 50% less agricultural usage;
- Scenario #3 - Medium population growth with 50% less recreational and 75% less agricultural usage;
- Scenario #4 - High population growth, based on San Diego County predictions with 50% less recreational and 100% less agricultural usage; and
- Scenario #5 - Reduction of all water usage to natural replenishment value of 4,800 acre feet per year.

The following are specific subtasks that will be completed as part of Task 2-1:

Subtask 2-1.1: Compilation of Available Hydrogeologic Data

This subtask will involve compiling and assembling data, including: climate, streamflow, water-level, landuse, crop-use, well logs, geophysical logs, geologic maps, hydrologic boundaries and watersheds, waste-water discharge, geodetic, and natural discharge data. Said data will be assembled into a Geographic Information System (GIS) database for manipulation and analysis on a geographic level.

Data will be sourced from previous studies by Moyle (1982), Mitten et al (1988), Netto (2001), and Henderson (2001), as these studies include recent information regarding the hydrogeologic units, recharge, discharge, groundwater levels, and groundwater flow of the Borrego Valley.

The GIS database will be preliminary in that it is compiled from existing data, and will be updated and revised throughout the study as new information is collected. The GIS database will be the basis for a three-dimensional, hydrogeologic framework and flow model of the aquifer system that will be completed in subsequent phases of the study (described in *Additional IRWM Plan Work*).

Subtask 2-1.2: Collection and Analysis of New Data

This subtask will involve refining the hydrogeologic framework of the Borrego Valley, as well as developing new geologic and hydrologic models. As such, this subtask will involve the compilation of new data regarding natural runoff and recharge, land elevation data, and well-bore flow and depth-dependent water-quality data.

Geodetic data for runoff and recharge and land elevation will be collected to provide precise and accurate well altitudes and to determine if subsidence is occurring in the Borrego Valley. Well-bore flow and depth-dependent water-quality data will be used to determine if there is a difference in well production and water quality with depth in the alluvium and older formations.

The following describes how such new data will be compiled.

Natural Runoff and Recharge

Precipitation and potential evapotranspiration will be used to estimate the natural runoff and recharge in the basin through implementation of a Basin Characteristic Model (BCM). The BCM will be used with available GIS data such as a digital elevation model, geology, soils, vegetation, precipitation, and air temperature maps compiled in the preliminary GIS database described under Subtask 2-1.1. The BCM may also be used to identify locations and climatic conditions that allow for excess water, therefore quantifying the amount of water available either as runoff or as in-place recharge on a monthly basis, and allowing for inter-basin comparisons of recharge mechanisms.

Land Elevation Data

Two methods of measuring land elevation data, Global Positioning System (GPS) and Interferometric Synthetic Aperture Radar (InSAR), are proposed to determine the location, extent, and magnitude of vertical land-surface changes. GPS surveying will result in measurements of elevation at selected locations (bench marks) that can then be compared to documented historical elevations of those bench marks to calculate vertical changes between the times of elevation measurements. InSAR will produce measurements of vertical land-surface change for various time periods between 1992 and 2008. While GPS measurements will provide actual elevations which will then be compared to previously measured elevations generally over longer time periods, InSAR measurements will provide relative elevation changes generally over shorter time periods.

Well-Bore Flow and Depth-Dependent Water-Quality Data

Well-bore flow and depth dependent water quality data may be collected from several production wells following the USGS methods and procedures for water supply wells. These data will help determine if there is a difference in well production and water quality with depth in the alluvium and older formations. If possible, existing water quality data will be supplemented with water chemistry data collected from monitoring wells and selected existing production wells.

Subtask 2-1.3: Conversion of Fine-Element Model into MODFLOW

The existing USGS model is a three-dimensional finite-element groundwater flow model of three aquifers in the Borrego Valley calibrated at steady-state (1945) and transient (1946-1979) conditions. The first step of Subtask 2-1.3 will be to update the finite-element model to MODFLOW-2005. Like the finite-element model, the updated model will consist of a steady-state stress period and seventeen two-year transient stress periods. The results of the MODFLOW-2005 model will be compared to the existing finite-element model and any differences will be summarized.

Subtask 2.1-4: Update the Model with Current Information

Once the model is converted to MODFLOW-2005, new hydrologic and hydrogeologic information can be incorporated into the simulation. Hydrogeologic framework and groundwater flow models will be developed as part of this study. The hydrogeologic model will include the refined and updated hydrogeologic framework and related hydrogeologic layering needed to build the groundwater flow model. This model will incorporate all of the information compiled in Tasks 2.1-1 through 2.1-3 and in previous studies, as well as any additional drillers and geophysical logs, cross sections, and geologic maps available. Measured groundwater levels collected from 1945 through 2005 will be used to calibrate the groundwater flow model.

Subtask 2.1-5: Prepare Reports

Status reports will be provided as needed to keep BWD informed of the status of work and any findings. Town Hall meetings in Borrego presentation of progress will be done in March of 2009 and March of 2010 (or at other mutually agreed upon appropriate times). A final report will be prepared describing size

and depth of the Borrego Valley groundwater flow system. The interpretive report will summarize the hydrogeologic framework, hydrologic budget, and results from the groundwater flow model.

The results of Subtasks 2-1.1 through 2-1.5 will be summarized for inclusion in the ABD IRWM Plan (refer to Task 3).

Deliverables

- Preliminary GIS database that includes a compilation of existing hydrogeologic and hydrologic data for the Borrego Valley.
- Updated data regarding natural runoff and recharge, land elevation data, and well-bore flow and depth-dependent water-quality data for the Borrego Valley.
- Summary of results of the MODFLOW-2005 model, including a summary of any differences between the MODFLOW-2005 model and the existing three-dimensional finite-element model.
- Updated hydrogeologic framework and groundwater flow model.
- Draft and final report summarizing the results of Subtasks 2-1.1 through 2-1.5, for incorporation into the IRWM Plan.
- Agendas for two (2) Town Hall meetings to present progress of groundwater modeling effort.
- Community Advisory Committee meetings to determine potential model run scenarios.

Task 2-2: Managing the Region's Groundwater Basins

Given the Region's reliance on groundwater supplies, it is imperative that the Region manages its groundwater basins in a scientific and economic manner. The purpose of Task 2-2 is to use existing data, including information prepared within the *ABD Region Summary* prepared by DWR and RMC-WRIME (refer to *Additional IRWM Plan Work*) and the *Characterization of Current Regional Water Supply* prepared by USGS and BWD (refer to Task 2-1), and work through an open and transparent stakeholder process to develop a ranked list of alternative strategies and associated funding mechanisms that would provide the Region with implementable strategies for adequately managing its groundwater resources. In addition, due to the intrinsic link between groundwater supplies and environmental integrity within the Region, Task 2-2 will also assess how environmental integrity issues have arisen and may continue to arise if the Region's groundwater basins are not adequately managed.

The following are specific subtasks that will be completed as part of Task 2-2:

Subtask 2-2.1: Alternative Strategies for Establishing Managed Basins

Following the description of baseline conditions and trends established in the *ABD Region Summary* and Task 2-1, potential alternative strategies that could be implemented to adequately manage the Region's groundwater basins will be developed. Please note that alternative strategies may include a compilation of various options, and are not limited to a single strategy. Potential options could include technical, legal, and legislative options such as groundwater recharge (technical), legally stipulated agreements negotiated among pumpers (legal), and special act legislation that grants groundwater management authority (legislative).

Work conducted under this subtask will include coordinating with the Stakeholders Committee to determine an agreed upon definition for adequately managing the Region's groundwater basins. Some of the questions that will be addressed in agreeing upon this definition will be:

1. What is necessary to develop a plan that actually addresses groundwater overdraft by bringing withdrawals into balance with annual recharge?
2. Who currently has or how can the Region establish the authority to enforce the plan?
3. What is a mechanism to pay for implementing the plan?

It is assumed that the *ABD Region Summary* and Task 2-1 will produce information regarding the baseline (existing) groundwater balance (supplies and demands), which does not constitute adequate management due to existing groundwater overdraft conditions. It is likely that the stakeholder group utilized for this subtask will be synonymous with the stakeholder group established to review and provide input for the *ABD Region Summary;* however attendance and participation will be open to all interested stakeholders, particularly DAC and tribal representatives.

This subtask will also involve developing a sound scientific and economic evaluation (a formal prioritization process) that will be used to rank each potential alternative. The prioritization process shall take into consideration the hydrologic feasibility that implementation of each alternative would lead the Region towards adequately managing its basins according to the definition of "adequately managing" as agreed upon by stakeholders. In addition, the prioritization process will assess the relative economic cost associated with implementing and operating each alternative over its reasonable lifetime.

The results of this prioritization process will include a prioritized list that ranks alternative strategies among each other and places alternative strategies into relative tiers. Up to eight (8) of the top-scoring alternative strategies will be placed within the "top-tier" of alternatives. The results of this process will be integrated into the IRWM Plan (refer to Task 3).

Subtask 2-2.2: Mechanisms for Funding Groundwater Management Alternatives

In conjunction with work completed under Subtask 2-2.1, potential mechanisms will be developed to analyze how alternative strategies included within the top-tier list of ranked alternatives could be funded on an ongoing basis. Any alternatives that are identified as financially infeasible will be removed from the top-tier list and replaced with subsequently ranked alternatives. This subtask will include development of financing proposals that describe how to finance implementation, operation, and maintenance of each financially feasible top-tier alternative through its reasonable life. The results of this process will be integrated into the IRWM Plan (refer to Task 3).

Subtask 2-2.3: Addressing Environmental Integrity Issues

This subtask will involve development of a summary of existing and future potential environmental integrity issues and their associated costs assuming continuation of existing conditions (i.e. not adequately managing the Region's groundwater basins). The purpose of this subtask is to provide information regarding environmental integrity-related issues that have arisen and will potentially arise in the future if the Region's groundwater basins are not adequately managed. Specifically, this subtask will address potential impacts that have occurred and may impact ecosystem services if the Region's groundwater basins are not adequately managed. The results of this process are not anticipated for incorporation into the alternative strategy ranking process (Subtask 2-2.1), but rather will be integrated into the IRWM Plan to describe the Region's important environmental resources as they relate to groundwater overdraft (refer to Task 3).

Other Studies or Work Products to be Utilized

- Work completed by DWR and RMC-WRIME under the *ABD Region Summary*.
- 2002 Groundwater Management Plan, Borrego Water District
- 2009 Integrated Water Resources Management Plan, Borrego Water District
- 2004 California's Groundwater Bulletin 118 for the Borrego Valley Groundwater Basin, DWR
- 2011 San Diego County General Plan Update, County of San Diego
- *Pending*: 2011 Evaluation of Groundwater Conditions and Land Subsidence in the Borrego Valley, United States Geological Survey
- *Pending*: Southeast California Regional Basin Study, United States Bureau of Reclamation and the Borrego Water District

- *Pending*: State and Tribal Assistance Grant (STAG) Borrego Springs Pipeline Feasibility Study, United States Environmental Protection Agency and the Borrego Water District

Deliverables

- Up to five (5) Stakeholders Committee meetings to discuss the alternative basin management strategies, the prioritization process, the potential funding mechanisms, and the existing and future potential environmental integrity issues. This deliverable will include agendas, presentations, handouts, and notes.
- Draft and final Groundwater Management Technical Memorandum including a summary of the Stakeholders Committee meetings, alternative strategies, prioritization process, potential funding mechanisms, and associated environmental integrity issues.
- Integration of conclusions and results of the Groundwater Management Technical Memorandum into the ABD IRWM Plan.

Task 2-3: Forecasting Changes in Water Quality as the Groundwater Basins are Dewatered

Although groundwater quality issues could have a potentially substantial impact with regards to the usability and affordability of groundwater and the Region's environmental integrity (refer to *Introduction*), groundwater quality has not been comprehensively analyzed within the Region. Therefore, the purpose of Task 2-3 is to develop forecasts that analyze potential water quality impacts and their relative economic and environmental integrity impacts that may arise due to the lowering of the Region's groundwater tables (dewatering).

The following are specific subtasks that will be completed as part of Task 2-3:

Subtask 2-3.1: Methodologies for Developing Water Quality Forecasts

This subtask involves development of methodologies (including assumptions) that will be utilized to develop water quality forecasts that demonstrate the potential water quality impacts that could occur and the timeframes over which they would occur as the Region's groundwater basins are dewatered. The forecasts will be required to demonstrate the magnitude and extent of water quality impacts under various groundwater management scenarios, including a baseline, "status quo," scenario. The baseline scenario would be established from information presented within the *ABD Region Summary* and Task 2-1, which will determine the current water balance of groundwater within the Region. If further water quality data is needed (e.g. to assess the conditions of the deeper aquifer), a work plan will be developed to accumulate and/or collect the necessary information. The results of Subtask 2-3.1 will be integrated into the IRWM Plan (refer to Task 3 below).

Subtask 2-3.2: Analyze Potential Economic Impacts and Impact Timeframes

This subtask involves implementation of the methodologies developed within Subtask 2-3.1 in order to complete forecasts that demonstrate the potential water quality impacts and the attendant economic costs of these impacts that may occur and the timeframes over which they would occur as the Region's groundwater basins are dewatered. The probabilistic economic cost estimates from this analysis will demonstrate the magnitude and extent of water quality impacts under various groundwater management scenarios, including a baseline scenario. This economic analysis is intended to address: "what are the economic consequences of continuing the overdraft at its present rate?" The results of this subtask will be integrated into the IRWM Plan (refer to Task 3).

Subtask 2-3.3: Addressing Environmental Integrity Issues

This subtask will involve development of a summary of existing and future potential environmental integrity issues that would be anticipated based on water quality forecasts determined within Subtask 2-3.2. The purpose of this subtask is to provide an estimate of both first and second order economic and qualitative information regarding environmental impacts that may potentially arise in the future due to a

probabilistically forecasted decline in water quality resulting from dewatering of the Region's groundwater basins. The results of this analysis will be integrated into the IRWM Plan to describe the Region's salient and projected environmental resources and the associated water quality needed to support these economically important environmental resources (refer to Task 3).

Deliverables

- Up to five (5) Stakeholders Committee meetings to discuss the water quality forecasts, the water quality forecast results, and the potential environmental integrity issues. This deliverable will include agendas, presentations, handouts, and notes.
- Draft and final Water Quality Technical Memorandum including methodologies, forecast results (economic impacts and timeframes), and associated environmental integrity issues.
- Integration of conclusions and results of the Water Quality Technical Memorandum into the IRWM Plan.

Task 2-4: Anticipating the Impacts of Climate Change on Regional Water Resources

The purpose of Task 2-4 is two-fold. First, this task will be utilized to conduct climate change analyses and efforts as specified by DWR within the Guidelines. Second, three key Regional issues (flood control, water supply, and environmental integrity) are anticipated to be affected by climate change. Therefore, Task 2-4 will provide information regarding climate change impacts, vulnerabilities, and possible solutions as they relate to the specific issues identified in the Region.

The following are specific subtasks that will be completed as part of Task 2-4:

Subtask 2-4.1: Climate Change Vulnerability Analysis, Flood Analysis and Prioritization

This task involves development of the climate change analysis required to address DWR's IRWM Grant Program Guidelines relating to climate change. As such, the analysis will assess the vulnerability of the Region to Region-specific climate change impacts, such as groundwater recharge rates and flooding. The vulnerability analysis will include an evaluation of the adaptability of water management systems in the Region to climate change, including water supply, wastewater, and flood control systems. To better understand the Region's flooding issues, the evaluation will include documenting flooding issues in the different communities in the Region (i.e. those in areas of "possible but undetermined risk as shown in Figure 3-8) through outreach to local community members, staff at the County of San Diego, and reviews of any available research and documentation. The Stakeholder Committee will establish priorities by which to rank climate change vulnerabilities, and then complete a prioritization exercise that ranks vulnerabilities in terms of risk and severity. The results of this process will be integrated into the IRWM Plan (refer to Task 3 below).

Subtask 2-4.2: Flood Control and Other Adaptation Strategies

Upon assessing the Region's vulnerability to climate change, work will be completed to identify specific adaptation strategies that can be completed to allow the Region to better adapt to anticipated climate change vulnerabilities. Considering that the Region already faces substantial impacts related to flooding and flood-based development restrictions, it is imperative that the Region have a comprehensive understanding of existing and potential future flood impacts and strategies for addressing such impacts. As such, this subtask will include an assessment of current and alternative flood control strategies that can be utilized to address existing and anticipated future (climate change-related) flood impacts. Part of the alternatives analysis will include an assessment of the relative costs of various flood control strategies in order to determine relative costs to address existing and future flood control techniques.

Further, this subtask will provide climate change adaptation strategies for all other top-ranking climate change vulnerabilities identified within Subtask 2-4.1. Due to the known nexus between climate change and groundwater recharge, it is anticipated that water supply (groundwater) will be one of the top-ranking

climate change vulnerabilities. This exercise will include an assessment of the relative costs of various climate change adaptation strategies. The results of this process will be integrated into the IRWM Plan (refer to Task 3).

Subtask 2-4.3: Addressing Environmental Integrity Issues

This subtask will involve development of a summary of future potential environmental integrity issues that would be anticipated throughout the Region based on the climate change vulnerability analysis completed within Subtask 2-4.1. The purpose of this subtask is to provide information regarding environmental issues anticipated to arise in the future due to anticipated climate change impacts. The results of this process will be integrated into the IRWM Plan (refer to Task 3).

Other Studies or Work Products to be Utilized

- 2010 *Probabilistic Analysis of the Effects of Climate Change on Groundwater Recharge*, Gene-Hua et al.
- 2010 White Paper – Borrego Springs Flood Risk Management Study, United States Army Corps of Engineers
- 2008 Water and Border Area Climate Change, DWR
- 2008 Managing an Uncertain Future – Climate Change Adaptation Strategies for California's Water – DWR
- 2010 Storm Stories Depict Vulnerability of Valley to Flooding/Heavy Rain, Borrego Sun
- 1989 Borrego Valley Flood Management Report, Boyle Engineering for the County of San Diego
- 1985 Rain and Streamflow History in Eastern San Diego County, County of San Diego
- 1976 Storm Report – Tropical Storm Kathleen, County of San Diego Department of Sanitation and Flood Control
- 1977 Storm Report – Tropical Storm Doreen, County of San Diego Department of Sanitation and Flood Control
- Guidelines for Flood Protection of Structures in Borrego Springs, County of San Diego
- 2011 Climate Change Handbook for Regional Water Management, USEPA Region 9 and DWR

Deliverables

- Up to five (5) Stakeholders Committee meetings to discuss and rank the climate change vulnerability analysis, the climate change adaptation strategies and costs, the flood control strategies and costs, and the potential environmental integrity issues. This deliverable will include agendas, presentations, handouts, and notes.
- Draft and final Climate Change Technical Memorandum including climate change vulnerabilities, climate change adaptation strategies and relative costs, flood control strategies and relative costs, and associated environmental integrity issues.
- Integration of conclusions and results of the Climate Change Technical Memorandum into the IRWM Plan.

Task 3: Prepare and Adopt the ABD IRWM Plan

Task 3 includes all activities required to prepare and adopt the IRWM Plan to meet DWR's Guidelines, and incorporate other work products such as stakeholder outreach and Regional Water Resources Plans described within Task 1 and Task 2 of this Work Plan. Please note that several of the tasks below include work completed by the Stakeholders Committee established in Task 1.

Task 3-1: Updates to Governance and Financing Plan

This task involves convening the Stakeholders to examine long-term governance alternatives available to the Region, including defining both decision-making and financing structures. This effort is intended to help the Region establish a long-term governance structure that will continue regional coordination and collaboration efforts throughout and beyond development of the IRWM Plan. These discussions will build upon the stakeholder outreach and interviews completed by CCP to date and will address any necessary changes to the existing governance structure established thus far (refer to Figure 3-5).

The Stakeholders Committee will develop a set of recommendations for long-term governance to present to the RWMG for consideration. These recommendations will include governance and financing proposals (i.e., how to finance annual program administration), as well as an implementation or transition plan for moving from the existing governance structure to the long-term governance structure. The RWMG will then present the long-term governance recommendations to their governing bodies for discussion and approval.

Other Studies or Work Products to be Utilized

- 2010 Draft IRWM Plan deliverables
- Work completed by CCP under DWR's Facilitation and Technical Support Contract (see *Additional IRWM Plan Work)*.

Deliverables

- Stakeholders Committee meetings as needed to discuss long-term governance and financing alternatives. These meetings are budgeted under Task 1-2.
- Draft and final Long-Term Governance recommendations addressing recommended decision-making structure, financing program, and implementation or transition plan.
- Draft and final formal governance agreements (MOU, etc.).

Task 3-2: Refine IRWM Plan Goals, Objectives, and Priorities

As the IRWM Plan is developed, a detailed refinement of the Region's goals and objectives will be necessary. As the Regional Water Resources Plans identified in Task 2 move forward, the RWMG will incorporate any new information learned about the Region's water management systems into the IRWM Plan. This may include clarification of critical water supply or water quality issues and/or incorporation of the new planning strategies into the IRWM Plan framework.

Based on this work, the Stakeholders Committee will work to refine the IRWM Plan goals and objectives to guide the Region during the next planning horizon. As all Stakeholders Committee meetings, these meetings will be advertised to all regional stakeholders and agendas will clearly identify that the IRWM Plan Goals, Objectives, and Priorities topics will be discussed. Additionally, the Stakeholders Committee shall revisit the short- and long-term priorities laid out in the Draft IRWM Plan to determine if the new information and/or changing regional conditions or regulatory requirements results in different priorities. At the conclusion of the Stakeholders Committee's discussion of the aforementioned topics, a recommendation shall be formalized and provided to the RWMG.

Due to the extensive nature of environmental integrity issues addressed within the Regional Water Resources Plans described within Task 2, the RWMG and Stakeholders Committee will be sure to incorporate information relating to environmental integrity into the IRWM Plan.

Other Studies or Work Products to be Utilized

- 2010 Draft ABD IRWM Plan deliverables

Deliverables

- Stakeholders Committee meetings as needed to address IRWM Plan goals, objectives, and priorities. These meetings are budgeted under Task 1-2.
- Draft and final IRWM Plan goals, objectives and priorities.

Task 3-3: Develop Data Management Plan

Data collected to date has included prior reports, memos, letters, and meeting minutes. These items along with raw data such as groundwater levels, water quality, pumping test results, and other information are routinely stored in BWD files, and incorporated into the BWD Geographic Information System (GIS) database. The BWD GIS database was developed in conjunction with the development of numeric modeling being formulated by USGS (refer to Task 2-1), and generally only covers portions of the Region.

Currently, the RWMG, with assistance from the Southern Region Office of DWR, is working to integrate the ABD State Park's extensive GIS data, which covers a large portion of the Region, into the BWD GIS database. In addition to this work, there is a need to incorporate portions of the County's GIS data into the BWD GIS database to create a robust GIS database with information for the entire Region.

This task will involve development of a regional data management system (DMS), which will be developed with common protocols for gathering data in a consistent manner, and making data accessible to the Stakeholders Committee and other stakeholders as appropriate. The DMS will be structured to ensure efficient use of available data, increase stakeholder access to data, and ensure that data gathered as part of IRWM-related activities can be integrated into existing State and local databases.

Other Studies or Work Products to be Utilized

- BWD GIS database
- San Diego County GIS database
- State Park GIS database
- GIS database established by BWD and USGS under Task 2-1
- 2010 Draft IRWM Plan

Deliverables

- Regional DMS with GIS data layers.
- Draft and final description of the ABD Data Management Plan describing the data available to stakeholders through the regional DMS.

Task 3-4: Develop Performance and Monitoring Methods

This task will involve incorporating information from the stakeholder outreach process (refer to Task 1) to determine appropriate targets by which to measure IRWM Plan performance. These metrics and targets will be aligned with the IRWM Plan goals and objectives (refer to Task 3-1) so that the Region can track how integrated projects are helping to achieve the Region's goals.

In addition, this task will involve determination of a reporting process that will be used to assess and report plan performance. An annual reporting process will be used to evaluate the Region's progress on

fulfilling the short-term priorities (i.e., program implementation), as well the Region's progress on implementing the identified water management projects (i.e., project implementation). The annual reporting will contain criteria used to evaluate the progress of implementation projects in meeting the IRWM Plan objectives. This will ensure that the Region is efficiently making progress towards meeting the objectives in the IRWM Plan, the Region is implementing projects listed in the IRWM Plan, and each project in the IRWM Plan is monitored to comply with all applicable rules, laws and permit requirements.

The annual reports will be short and concise summaries that can be used to communicate Plan performance to stakeholders, the public, and the RWMG governing bodies. The annual reports will be delivered in both print and electronic copy to reach as many stakeholders as possible. Due to the importance of stakeholder outreach and transparency within the Region, the annual report will be designed such that it may be presented at the Borrego Springs Annual Town Hall Meeting held in April of each year.

Stakeholders Committee meetings will include a discussion of metrics, targets, and the proposed reporting process. At the conclusion of the Stakeholders Committee's discussion of the aforementioned topics, a recommendation shall be formalized and provided to the RWMG. The RWMG will utilize meetings with the public, stakeholders, and the Stakeholders Committee under Task 1 to discuss and present the Stakeholder Committee's recommendation.

Other Studies or Work Products to be Utilized

- 2010 Draft ABD IRWM Plan

Deliverables

- Stakeholders Committee meetings as needed to address IRWM Plan metrics, targets, and the proposed reporting process. These meetings are budgeted under Task 1-2.
- Draft and final IRWM Plan metrics.
- Draft and final IRWM Plan performance and monitoring methods.
- Design draft and final template for Annual Report.

Task 3-5: Describe IRWM Process Relating to Local Land Use and Water Planning

The RWMG will work with local land use planning efforts, including State and Federal agencies with land use authority such as the State Park, the Bureau of Land Management (BLM), local Resource Conservation Districts, and others to define land use issues as they relate to water management. The RWMG will also invite other water managers such as local community service districts to participate in this task. This task will involve continued dialogue between the RWMG agencies, the State Park, and other agencies with land use and water authority to ensure continued cooperation in implementing IRWM-related projects and meeting regional goals and objectives established under Task 3-2. It is assumed that these parties will meet up to four (4) times during development of the IRWM Plan to ensure that there is an exchange of knowledge and expertise between land use and water managers and identify how to improve planning efforts between these entities. These meetings will occur concurrently with Stakeholders Committee meetings described within Task 1, and will be specially advertised to local land use and water management authorities.

Other Studies or Work Products to be Utilized

- 2011 San Diego County General Plan Update, County of San Diego
- 2010 Draft IRWM Plan Deliverables
- 2005 Anza-Borrego Desert State Park Final General Plan and Environmental Impact Report
- All planning documents for local water authorities including BWD, the RCD, and other participating water agencies.

Deliverables

- Stakeholders Committee meetings as needed, specifically advertised to land use and water managers, that address land use and water planning. These meetings are budgeted under Task 1-2.
- Draft and final IRWM Plan text describing coordination between water management and land use planning.

Task 3-6: Prepare IRWM Plan per State Guidelines

Based on all of the work completed in Tasks 3-1 through 3-5 above, the RWMG will prepare an Administrative Draft IRWM Plan for internal review. In addition, the RWMG will utilize information for sections such as Resource Management Strategies, Impacts and Benefits, and Integration Opportunities that were included within the Draft IRWM Plan. It is assumed that any sections or work for the IRWM Plan not specifically called out in the sections above will be completed as part of Task 3-6.

The Administrative Draft IRWM Plan will contain the following sections:

1. Introduction
2. Region Description, Issues, and Needs
3. Governance and Stakeholder Involvement
4. Vision, Mission, Goals and Objectives
5. Resource Management Strategies
6. Integration Opportunities
7. Project Evaluation and Prioritization
8. Data Management and Technical Analysis
9. Framework for Implementation
10. References

As part of the IRWM Plan development process, the RWMG will document how the IRWM Plan meets State goals and priorities. The IRWM Plan will contain a clear description outlining the location of all content as required by DWRs' IRWM Plan Guidelines. The IRWM Plan will also clearly articulate steps for evaluation and measurement of Plan success.

The RWMG will then prepare a Public Review Draft IRWM Plan for review and consideration by the Stakeholders Committee, at Public Workshops, and by any other interested parties. Two (2) Public Workshops will be conducted to present and discuss the Draft IRWM Plan (see Task 1). The RWMG will facilitate review and discussion of the draft IRWM Plan with stakeholders, including collecting and compiling their comments into a comments matrix.

Following public review of the draft IRWM Plan, the RWMG will review comments, present IRWM Plan changes in response to comments, and solicit agreement from the Stakeholders Committee on the proposed changes. Based on the comments reviewed from the Stakeholders Committee and general public, the RWMG will prepare an Administrative Final IRWM Plan. Following one round of revisions based on final comments, the RWMG will prepare a Final IRWM Plan for presentation to the Stakeholders Committee and other interested parties.

Following completion of the IRWM Plan, the RWMG will prepare an IRWM Plan Executive Summary that will provide a short, visually appealing overview of the IRWM Plan and related activities. The Executive Summary will showcase and communicate IRWM Plan benefits and milestones to the general public, stakeholders, and governing bodies. The Executive Summary will serve as an educational document for the IRWM program that describes the program and explains the value that IRWM planning provides to the Region.

Lastly, the RWMG will facilitate adoption of the IRWM Plan Update by their respective governing boards.

Other Studies or Work Products to be Utilized

- All plans listed in Task 1, Task 2, and previous subtasks of Task 3.

Deliverables:

- Administrative Draft IRWM Plan, in accordance with State Guidelines;
- Public Review Draft IRWM Plan;
- Compiled response to comments matrix;
- Administrative Final IRWM Plan;
- Final IRWM Plan;
- IRWM Plan Executive Summary; and
- Presentation summarizing IRWM Plan for use at Board/Council hearings.
- IRWM Plan Update adoption resolutions

A. Task 4: Grant Administration

This task addresses administration of the Planning Grant Contract between BWD and DWR. Preparation of the contract materials, invoices, progress reports, and project performance documentation is included within this task. Project oversight and grant administration will be provided by BWD staff.

Deliverables

- Planning Grant contract, invoices, progress reports, and project performance documentation.

4. Additional IRWM Plan Work

There are multiple existing efforts within the Region that will be performed in addition to Grant Work Plan that will be utilized in developing a standards-compliant IRWM Plan. The following sections provide details regarding each of these efforts as they relate to development of the ABD IRWM Plan.

DWR Facilitation and Technical Support – Phase 2

CCP will continue work completed under Phase 1 of the DWR Facilitation and Technical Support contract (see *Introduction*), and will therefore provide facilitation services for at least six (6) monthly stakeholder meetings with stakeholders in the ABD IRWM Region. CCP will also conduct limited stakeholder outreach to those unable or unwilling to attend Stakeholder Committee meetings. One goal of Phase 2 is to develop and adopt a Memorandum of Understanding or another formal governance agreement, such as a charter and ground rules, that will enable the Region to work together towards IRWM planning. A second goal of this stakeholder outreach effort will be to support the planning and analysis completed in the *DWR ABD Region Summary* effort below, such that the Region's stakeholders achieve consensus on the scale of Region's groundwater issues and the state of the Region's basins. All work under this effort will be completed by December 2012.

This work will be solely sourced from DWR through Task Order No. 7-11 Borrego IRWMP under DWR Contract No. 4600007671.

DWR ABD Region Summary

DWR and RMC-WRIME will work to complete the *ABD Region Summary*, which also includes two phases. Phase 1, which is anticipated for completion by March 2012, will include an assessment of existing information regarding water supply conditions of the Borrego Valley Groundwater Basin. The ultimate goal of this assessment is to provide a set of facts regarding the basin that can be used for outreach purposes and to garner regional acceptance of the current state of the Borrego Valley Groundwater Basin from a water balance perspective. Phase 2, which is anticipated for completion by September 2012, will include an assessment of groundwater basins throughout the entire ABD IRWM Region. This effort will include stakeholder outreach (partnered with the *DWR Facilitation and Technical Support – Phase 2* effort above) to receive input on the groundwater analysis within the report.

Data from the two aforementioned phases will be compiled into one larger *ABD Region Summary* report that assesses groundwater supply conditions throughout the ABD IRWM Region with particular emphasis on the Borrego Valley Groundwater Basin, which supplies water to the majority of the Region's residents.

This work will be solely sourced through DWR's Southern Region Office.

United States Bureau of Reclamation Southeast California Regional Basin Study

The *Southeast California Basin Study* is a current effort between the United States Bureau of Reclamation (USBR), BWD, the Imperial Irrigation District, the Coachella Valley Water District, and the San Diego County Water Authority. As indicated within Task 2 of this Work Plan, the *Southeast California Basin Study* will be utilized as a reference and supporting document to complete Task 2-2. This study aims at assessing existing water resources, water management practices, and system components to optimize water resources across southeastern California. The study has five major goals, including:

- Characterizing current regional water supply and demand;
- Assessing risks to regional water supplies , including those due to climate change;
- Identifying potential strategies and options to resolve water supply and demand imbalances;
- Identifying potential legal and regulatory constraints and potential impacts to water users; and
- Prioritizing identified strategies and options for potential future actions.

The *Southeast California Basin Study* began in January 2011, and is anticipated for completion by January 2013. The study will be paid for by the USBR and BWD through a 50/50 cost share.

USEPA State and Tribal Assistance Grant Study, Borrego Springs Pipeline Feasibility Study

In 2009, BWD was awarded a State and Tribal Assistance Grant from the U.S. Environmental Protection Agency (USEPA) to perform a feasibility study of an imported water pipeline. The grant amount totaled $267,000 and the final report is due in February 2012.

The scope for this feasibility study includes several routes that could be utilized for delivering imported water supplies to the Borrego Valley and includes the aspect of water banking sites along the route. Detailed analyses were performed on right-of-way mapping, existing easements, physical barriers along the proposed pipeline routes, potential cultural issues, suspected paleontology sites and habitat for endangered or threatened local flora and fauna. Results from this feasibility study will be incorporated into USBR's *Southeast California Basin Study* and the ABD IRWM Plan. The tasks for this feasibility study include:

- Study Element A – Pipeline Routing from Borrego to Ocotillo Wells
- Study Element B – Pipeline Routing from Ocotillo Wells to Carter Reservoir
- Study Element C – Pipeline Routing Investigation along Power Line from Ocotillo Wells to IID's Westside Canal
- Study Element D – Pipeline from Borrego Springs to Clark Lake Aquifer
- Study Element E – Pipeline Routing Environmental and Permitting Issues
- Study Element F – Allegretti Sub-basin as a Source Water Study

Deliverables from this feasibility study will include detailed maps with pipeline location information, reports on interviews with jurisdictional agencies along the proposed routes, geologic evaluations of potential groundwater banking areas, and a final report combining all of the information into a resource document.

5. References

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Exhibit A

Anza Borrego Desert Integrated Regional Water Management

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DATE: December 29, 2011
TO: Brian Moniz, California Dept. of Water Resources
FROM: Jerry Rolwing
RE: IRWM Regional Acceptance Process for Anza Borrego Desert IRWMG

The Borrego Water District began working to secure a position in the San Diego County IRWMG in 2006. After attending several of the stakeholder meetings, the District was politely asked to leave the group for geographical reasons (attachment A). When confronted, the County IRWM representative, offered to assist Borrego in forming a second County group which would better meet our geological area requirements. Several attempts were made to join in the early programs with Coachella Valley and Imperial County but were unsuccessful, this time due to political boundary considerations. With the assistance of our consultant Bill Mills, the District was able to locate and secure support from the Resource Conservation District of Greater San Diego County and the County of San Diego, through the Department of Planning and Land Use who had direct control over land use and associated water regulations (attachment B).

Our original submittal to the DWR featured the Borrego Valley Watershed area only (attachment C). After meeting with the DWR through an RAP interview, it was agreed for the area boundary to be expanded to better suit the "regional" requirement of the process. The area was expanded to include the portion of San Diego County that lies in the Colorado River Hydrologic Basin Region. The new area combined the Borrego Valley watershed which extends into Riverside County and the area of San Diego County east of the Tecate Divide. The expanded area included the entire Anza-Borrego Desert State Park, Ocotillo Wells State Vehicular Recreation Area, four public water purveyors and five Indian Reservations. The updated boundary and location of the public water systems are featured on the regional map (attachment D). All of these groups have been approached by the Borrego Water District to be included in the program. The IRWMG continues to outreach to these groups and has had some success in recruiting these regional stakeholders but due to various reasons, some groups have declined to participate. The ABD_IRWMG will continue to pursue this level of outreach and the plan work continues.

County of San Diego

DEPARTMENT OF PUBLIC WORKS

JOHN L. SNYDER
DIRECTOR

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November 22, 2006

Russ Fogarty
General Manager
Borrego Water District
P.O Box 1870
Borrego Springs, CA 92004

Dear Mr. Fogarty:

I am responding to your letter of September 7, 2006, requesting inclusion of the Borrego Valley in the planning area of the San Diego Integrated Regional Water Management (IRWM) Plan. As you are aware, the development of this Plan, currently scheduled for adoption in mid-2007, has been in progress since late 2004. Responsibility for its completion currently resides with a Regional Water Management Group (RWMG) which is a partnership of the San Diego County Water Authority, the City of San Diego, and the County of San Diego (County). Although we find merit in your request to be included in an IRWM Plan process, please understand that including Borrego Valley in the San Diego IRWM Plan requires the concurrence of all three RWMG member agencies.

An issue of critical importance in initiating the San Diego IRWM effort was to define the geographic area to be addressed in the Plan. After careful consideration, the RWMG determined that this should include the area of intersection of San Diego County and California Regional Water Quality Control Board (RWQCB) Region Nine. County staff presented your letter and issue of whether the IRWM Plan boundary should be modified to include the Borrego Valley at a meeting of the RWMG on September 25, 2006. At that meeting, it was decided that the boundaries of the San Diego IRWM Plan should not be adjusted at this time. The primary reasons for this decision are as follows:

The hydrology and physical geography of the Borrego Valley are distinctly different from the IRWM Plan area. A defining characteristic of the IRWM Plan region is the inclusion of all westward draining watersheds. The Borrego Valley is located in a separate hydrologic region with vastly different climates, runoff characteristics, and hydrology.

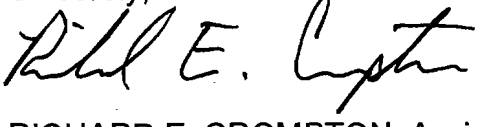
Water supply and wastewater patterns and practices are very different between these two areas. Imported water is the predominant source of supply within the San Diego IRWM Region, and the imported water is supplied by a single wholesale imported water agency – The San Diego County Water Authority. This commonality of water supply and wastewater patterns requires that the Region work together to manage water resources efficiently and to develop a diverse reliable water supply for the Region.

Modifying the IRWM Region at this late date would sidetrack efforts to complete and adopt the Plan on its current schedule. The Plan must be adopted in mid-2007 to enable the Region to apply and compete for State funding under Propositions 50 and 84.

The Borrego Valley presents water supply, water quality, and ecological issues and challenges that are generally quite distinct from those of the San Diego IRWM Region. During the RWMG meeting, it was suggested that the Borrego Water District approach the Imperial Irrigation District (IID) to coordinate an Integrated Regional Water Management Plan within the Colorado River Basin.

Again, please understand the County does not have the authority to determine whether or not Borrego Valley is included within the San Diego IRWM Plan Region. If you have any questions, or if you would like to further discuss the details of this issue with representatives of the RWMG, please contact Jon Van Rhyn at (858) 495-5133.

Sincerely,



RICHARD E. CROMPTON, Assistant Director
Department of Public Works

REC/sm

cc: Ken Weinberg, Director of Water Resources, San Diego County Water Authority
4677 Overland Avenue
San Diego, CA 92123

Marsi Steirer, Deputy Water Department Director, City of San Diego
City of San Diego Water Department
600 B Street, Suite 600, MS 906
San Diego, CA 92101

Jon Van Rhyn, Program Manager, Department of Public Works MS 0384

EG

ERIC GIBSON
DIRECTOR

County of San Diego

DEPARTMENT OF PLANNING AND LAND USE

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April 22, 2009

Mr. Richard S. Williamson, P.E.
General Manager
Borrego Water District
P.O. Box 1870
806 Palm Canyon Drive
Borrego Springs, CA 92004

RE: Borrego Water District (BWD) Regional Water Management Group

Dear Mr. Williamson:

This letter is to provide notification that the County of San Diego Department of Planning and Land Use (DPLU) gladly accepts your invitation to be a member of the Borrego Water District Regional Water Management Group (RWMG). The County appreciates this great opportunity to work together on the challenges of planning future growth and managing the groundwater resources of Borrego Valley.

Our main point of contact and representative for the RWMG will be Jim Bennett, County Groundwater Geologist, who can be reached at 858-694-3820 or jim.bennett@sdcounty.ca.gov.

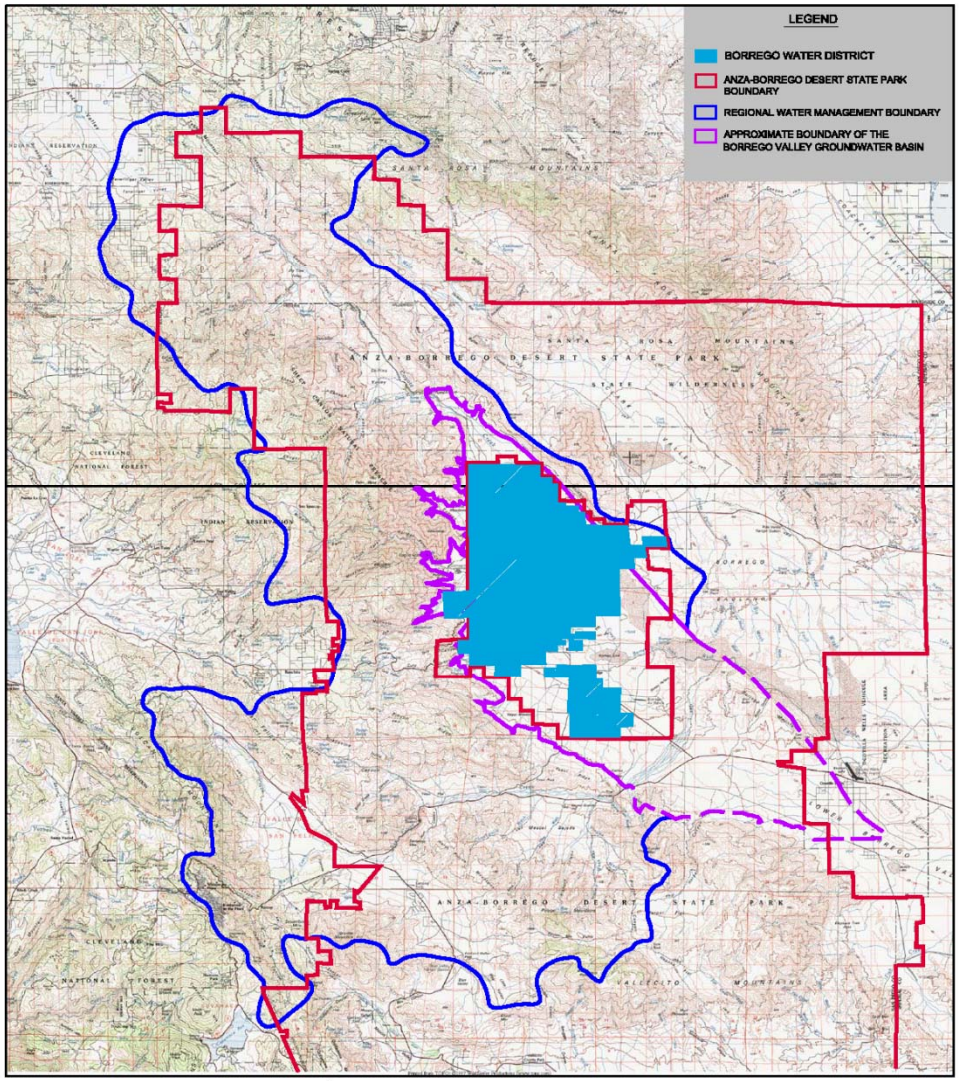
Sincerely,

ERIC GIBSON, Director
Department of Planning and Land Use

EG:jb

cc: Jim Bennett, County of San Diego, Department of Planning and Land Use

Exhibit A



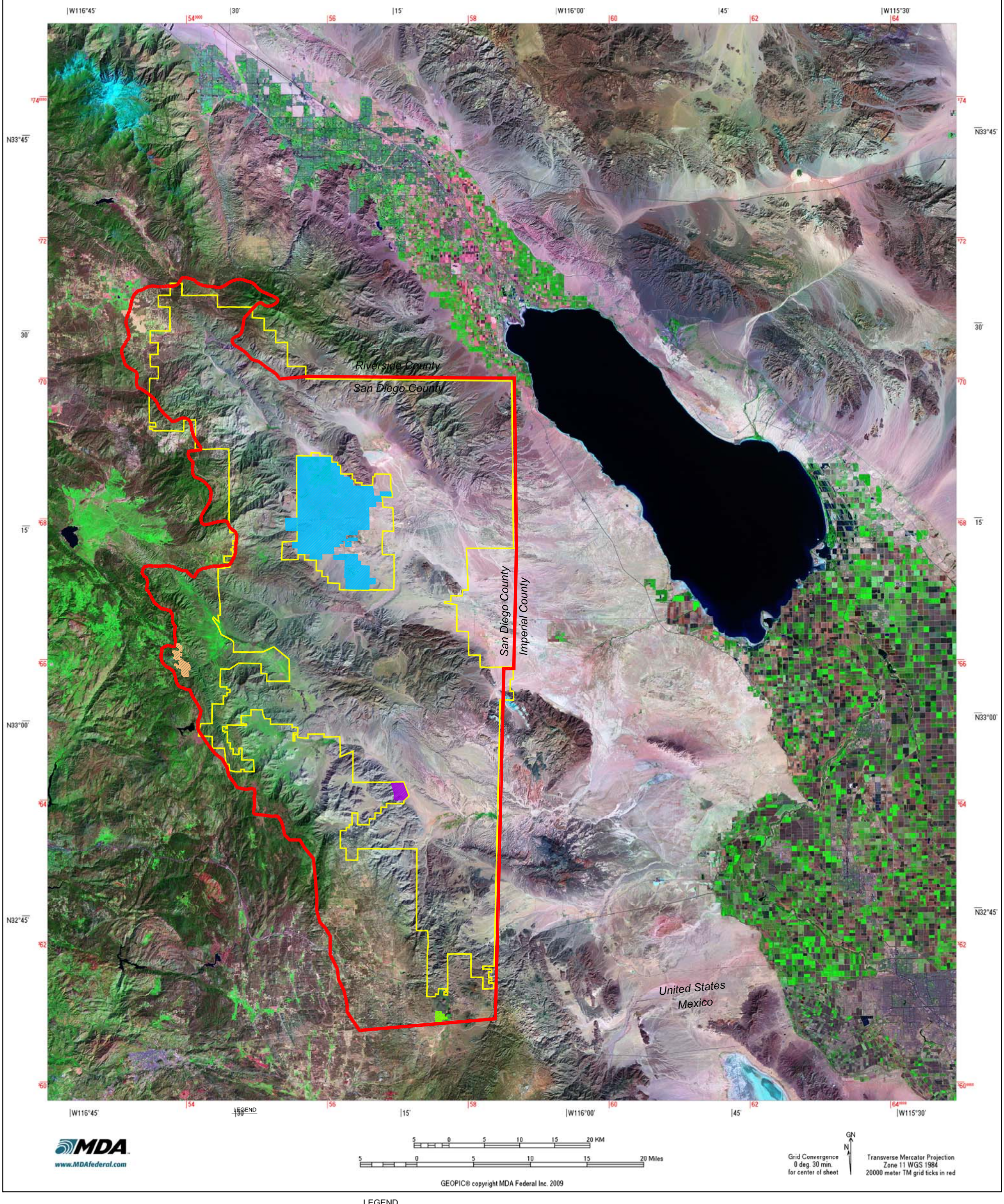
Attachment C

Exhibit A

Borrego Water District

Landsat7 ETM+ Bands 742 (RGB)

Paths 039/040 Row 37 11 Oct / 24 Sep – 2009



LEGEND

- INTEGRATED REGIONAL WATER MANAGEMENT BOUNDARY
- ANZA-BORREGO DESERT STATE PARK BOUNDARY
- BORREGO WATER DISTRICT
- CANEBRAKE WATER DISTRICT
- JACUMBA C.S.D.
- MAJESTIC PINES C.S.D.

Borrego Water District

ANZA BORREGO DESERT
INTEGRATED WATER MANAGEMENT REGION

Imperial, San Diego and Riverside Counties, California

Attachment D