ENGINEER'S REPORT ON WATER SUPPLY AND REPLENISHMENT ASSESSMENT

Lower Whitewater River Subbasin Area of Benefit

2012-2013

Prepared for

COACHELLA VALLEY WATER DISTRICT

April 2012

As presented to the Board on April 10, 2012

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Prepared by
Environmental Services Division
Engineering Department
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COACHELLA VALLEY WATER DISTRICT

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INTRODUCTION

This is the ninth annual Engineer's Report on Water Supply and Replenishment Assessment for the Lower Whitewater River Subbasin Area of Benefit managed by the Coachella Valley Water District (CVWD). This program began in the 2004-2005 fiscal year and has replenished the lower portion of the Whitewater River Subbasin with a cumulative total of approximately 129,639 acre-feet (AF) of supplemental water.

CVWD serves an area of approximately 1,000 square miles in the Coachella Valley (Valley) within the counties of Riverside, Imperial and San Diego. The Valley is situated in the northwesterly portion of California's Colorado Desert. The Valley is bordered on the west and north by high mountains, which provide an effective barrier against coastal storms, and which greatly reduce the contribution of direct precipitation to recharge the Valley's groundwater basin. The bulk of natural groundwater recharge comes from runoff from the adjacent mountains.

The need to enhance the Valley's water supply has been recognized for many years. The formation of CVWD in 1918 was a direct result of the concern of residents over a plan to export water from the Whitewater River to Imperial Valley. The early residents of the Valley also recognized that action was needed to stem the decline of the water table, which was occurring as a result of their pumpage. This caused CVWD to enter into an agreement for construction of the Coachella Branch of the All American Canal (Coachella Canal or Canal) to bring Colorado River water to the Valley. Since 1949, the Coachella Canal has been providing water for irrigation use in an area generally from Indio and La Quinta southerly to the Salton Sea.

After providing supplemental water in the southeastern part of the Valley and with the onset of recreational development, the need for supplemental water in the northwestern part of the Valley was recognized. As a result, CVWD and the Desert Water Agency (DWA) entered into separate contracts with the State of California (State) to ensure that water from the State Water Project (SWP) would be available. A direct connection from the SWP to the Valley does not currently exist. Therefore, CVWD and DWA entered into an agreement with the Metropolitan Water District of Southern California (MWD) to obtain water from the MWD Colorado River Aqueduct, which crosses the upper portion of the Valley near Whitewater, in exchange for CVWD and DWA SWP water. Since 1973, CVWD and DWA have been releasing Colorado River water near Whitewater to replenish groundwater in the upper portion of the Whitewater River Subbasin of the Valley.

As of December 2002, CVWD and DWA also began recharge activities at the Mission Creek recharge facilities overlying the Mission Creek Subbasin.

In addition, CVWD, recognized the need for other sources of water and entered the water reclamation field in 1967 and currently operates six water reclamation plants (WRPs) in the Valley. Recycled water from two of these facilities (WRP 9 and WRP 10) has been used for golf course and greenbelt irrigation in the Palm Desert area for many years, thereby reducing demand on the groundwater basin. A third facility (WRP 7), located north of Indio, began providing recycled water for golf course and greenbelt irrigation in 1997.

In the lower portion of the Whitewater River Subbasin, groundwater levels have been declining since 1980. In response to this, CVWD has implemented a groundwater replenishment program to recharge the Subbasin at two sites in the Lower Valley. Groundwater recharge began in 1997 using pilot groundwater recharge facilities. The pilot project at the Dike 4 site became the fully operational *Thomas E. Levy Groundwater Replenishment Facility* in June 2009. The Martinez Canyon site began operating in 2004 and is expected to be expanded in the future. The combined cumulative total recharge at these sites was 129,639 AF at the end of 2011. The full-scale capacity of each of these recharge facilities could reach 40,000 AF/year.

In 2002 the CVWD Board of Directors adopted the Coachella Valley Water Management Plan. The Plan was updated in 2010 (2010 CVWMP Update). The goal of the 2010 CVWMP Update is to reliably meet current and future water demands in a cost effective and sustainable manner through water conservation, increased surface water supplies, substitution of surface water supplies for groundwater (source substitution), groundwater recharge, and monitoring. The 2010 CVWMP Update can be found on CVWD's website at www.cvwd.org.

The State Water Code requires completion of an Engineer's Report regarding the Replenishment Program before CVWD can levy and collect groundwater replenishment assessment charges (RACs). The report shall include the condition of groundwater supplies, the need for groundwater replenishment, the Area of Benefit, water production within said area, and RACs to be levied upon said water production. It shall also contain recommendations regarding the replenishment program including the source and amount of replenishment water and related costs. The first Engineer's Report for the Lower Whitewater River Subbasin Area of Benefit was completed in April 2004.

The purpose of this report is to update the groundwater supply conditions and current replenishment program and to establish a RAC for the Lower Whitewater River Subbasin Area of Benefit for the upcoming fiscal year.

GROUNDWATER BASIN DESCRIPTIONS

Geology

The Coachella Valley Groundwater Basin, as described by the California Department of Water Resources (DWR), is bounded on the north and east by non-water bearing crystalline rocks of the San Bernardino and Little San Bernardino Mountains and on the south and west by the crystalline rocks of the Santa Rosa and San Jacinto Mountains. At the west end of the San Gorgonia Pass, between Beaumont and Banning, the basin boundary is defined by a surface drainage divide separating the Coachella Valley Groundwater Basin from the Beaumont Groundwater Basin of the Upper Santa Ana drainage area.

The lower boundary is formed primarily by the watershed of the Mecca Hills and by the northwest shoreline of the Salton Sea running between the Santa Rosa Mountains and Mortmar. Between the Salton Sea and Travertine Rock, at the base of the Santa Rosa Mountains, the lower boundary roughly coincides with the Riverside/Imperial County Line.

Southerly of the lower boundary, at Mortmar and at Travertine Rock, the subsurface materials are predominantly fine grained and low in permeability; although groundwater is present, it is not readily extractable. A zone of transition exists at these boundaries; to the north, the subsurface materials are coarser and more readily yield groundwater.

Although there is interflow of groundwater throughout the groundwater basin, fault barriers, constrictions in the basin profile and areas of low permeability limit and control movement of groundwater. Based on these factors, the groundwater basin has been divided into Subbasins and Subareas as described by DWR in 1964 and the United States Geological Survey (USGS) in 1971.

The Subbasins present in the Valley are Mission Creek, Desert Hot Springs, Garnet Hill, and Whitewater River (also known as Indio). The Subbasins, with their groundwater storage reservoirs, are defined without regard to water quantity or quality. They delineate areas underlain by formations which readily yield the stored water through water wells and offer natural reservoirs for the regulation of water supplies.

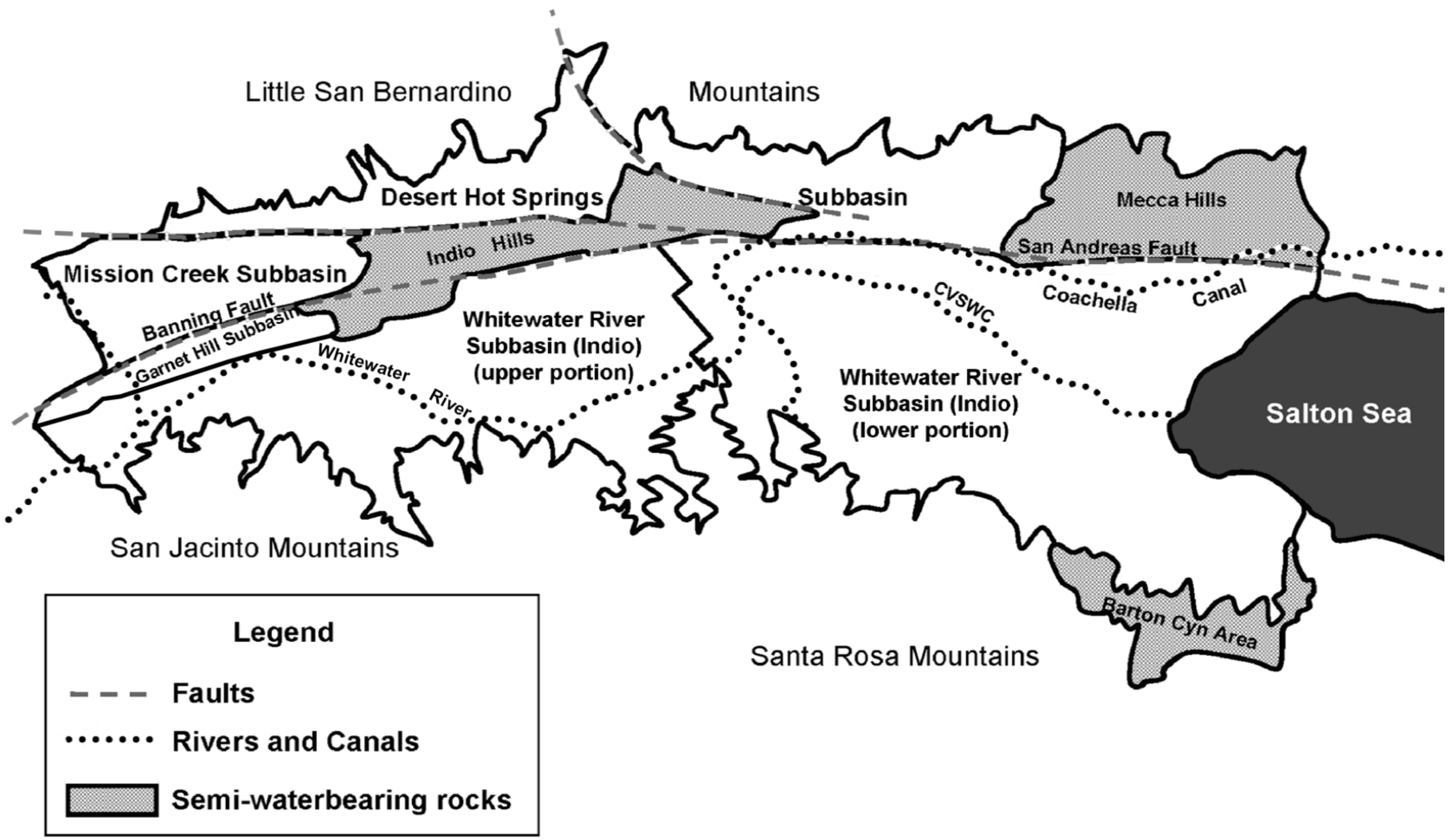
The boundaries between Subbasins within the groundwater basin are generally based upon faults that are effective barriers to the lateral movement of groundwater. Minor Subareas have also been delineated, based on one or more of the following geologic or hydrologic characteristics: type of water bearing formations, water quality, areas of confined groundwater, forebay areas, groundwater divides and surface drainage divides.

The following is a list of the Subbasins and associated Subareas, based on the DWR and USGS designations:

- Mission Creek Subbasin
- Desert Hot Springs Subbasin
- Garnet Hill Subbasin
- Whitewater River (Indio) Subbasin
    - Palm Springs Subarea
    - Thermal Subarea
    - Thousand Palms Subarea
    - Oasis Subarea

Figure 1 shows the locations of these Subbasins. This report presents brief descriptions of the Mission Creek Subbasin, Desert Hot Springs Subbasin, and Garnet Hill Subbasin as they are located outside the area of interest for this report. A more detailed description of the Whitewater River (Indio) Subbasin is provided in this report.

Figure 1 **Coachella Valley Groundwater Subbasins**



The following are areas within the Valley where a supply of potable groundwater is not readily available:

- Indio Hills area
- Mecca Hills area
- Barton Canyon area
- Bombay Beach area
- Salton City area

Mission Creek Subbasin

Water-bearing materials underlying the Mission Creek upland comprise the Mission Creek Subbasin. This subbasin is designated number 7-21.02 in DWR's Bulletin 118 (2003). The subbasin is bounded on the south by the Banning fault and on the north and east by the Mission Creek fault. The subbasin is bordered on the west by non-waterbearing rocks of the San Bernardino Mountains. To the southeast of the subbasin are the Indio Hills, which consist of the semiwater-bearing Palm Springs Formation. The area within this boundary reflects the estimated geographic limit of effective storage within the subbasin. This subbasin relies on the same imported State Water Project Exchange water source for replenishment as does the Whitewater River Subbasin.

CVWD, Desert Water Agency (DWA), and Mission Springs Water District jointly manage this subbasin under the terms of the 2004 Mission Creek Settlement Agreement. This agreement and the 2003 Mission Creek Groundwater Replenishment Agreement between the District and DWA specify that the available State Water Project water will be allocated between the Mission Creek and Whitewater River Subbasins in proportion to the amount of water produced or diverted from each subbasin during the preceding year.

Desert Hot Springs Subbasin

The Desert Hot Springs subbasin is bounded on the north by the Little San Bernardino Mountains and to the southeast by the Mission Creek and San Andreas faults. The San Andreas fault separates the Desert Hot Springs subbasin from the Whitewater River subbasin and serves as an effective barrier to groundwater flow. The subbasin has been divided into three subareas: Miracle Hill, Sky Valley and Fargo Canyon. This subbasin is designated number 7-21.03 in DWR's Bulletin 118 (2003).

The Desert Hot Springs subbasin is not extensively developed except in the area of Desert Hot Springs. Relatively poor groundwater quality has limited the use of this subbasin for groundwater supply. The Miracle Hill subarea underlies portions of the City of Desert Hot Springs and is characterized by hot mineralized groundwater, which supplies a number of spas in that area. The Fargo Canyon subarea underlies a portion of the planning area along Dillon

Road north of Interstate 10. This area is characterized by coarse alluvial fans and stream channels flowing out of Joshua Tree National Park. Based on limited groundwater data for this area, flow is generally to the southeast. Water quality is relatively poor with salinities in the range of 700 to over 1,000 mg/L.

Garnet Hill Subbasin

The area between the Garnet Hill fault and the Banning fault, named the Garnet Hill Subarea by DWR (1964), was considered a distinct subbasin by the USGS because of the effectiveness of the Banning and Garnet Hill faults as barriers to groundwater movement. This is illustrated by a difference of 170 feet in groundwater level elevation in a horizontal distance of 3,200 feet across the Garnet Hill fault, as measured in the spring of 1961. The fault does not reach the surface and is probably effective as a barrier to groundwater movement only below a depth of about 100 feet.

Although some recharge to this subbasin may come from Mission Creek and other streams that pass through during periods of high flood flows, the chemical character of the groundwater plus its direction of movement indicate that the main source of recharge to the subbasin comes from the Whitewater River through the permeable deposits which underlie Whitewater Hill. Based on groundwater level measurements, this area is partially influenced by artificial recharge activities at the Whitewater Spreading Facilities at Windy Point. This subbasin is considered part of the Whitewater River (Indio) Subbasin in DWR’s Bulletin 118 (2003).

Whitewater River (Indio) Subbasin

The Whitewater River Subbasin, designated the Indio Subbasin (Basin No. 7-21.01) in DWR Bulletin No. 118 (2003), underlies the major portion of the Valley floor and encompasses approximately 400 square miles. Beginning approximately one mile west of the junction of State Highway 111 and Interstate Highway 10, the Whitewater River Subbasin extends southeast approximately 70 miles to the Salton Sea. The Subbasin is bordered on the southwest by the Santa Rosa and San Jacinto Mountains and is separated from Garnet Hill, Mission Creek and Desert Hot Springs Subbasins to the north and east by the Garnet Hill and San Andreas faults (DWR 1964). The Garnet Hill fault, which extends southeastward from the north side of San Gorgonio Pass to the Indio Hills, is a relatively effective barrier to groundwater movement from the Garnet Hill Subbasin into the Whitewater River Subbasin, with some portions in the shallower zones more permeable. The San Andreas fault, extending southeastward from the junction of the Mission Creek and Banning faults in the Indio Hills and continuing out of the basin on the east flank of the Salton Sea, is also an effective barrier to groundwater movement from the northeast. The subbasin underlies the cities of Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio and Coachella, and the unincorporated communities of Thousand Palms, Thermal, Bermuda Dunes, Oasis and Mecca. From about Indio southeasterly to the Salton Sea, the subbasin contains increasingly thick layers of silt and clay, especially in the shallower portions of the subbasin. These silt and clay layers, which are remnants of ancient lake beds, impede the percolation of water applied for irrigation and limit groundwater recharge opportunities to the westerly fringe of the subbasin.

In 1964, DWR estimated that the five subbasins that make up the Coachella Valley groundwater basin contained a total of approximately 39.2 million acre-feet (AF) of water in the first 1,000 feet below the ground surface; much of this water originated as runoff from the adjacent mountains. Of this amount, approximately 28.8 million AF of water was stored in the Whitewater River Subbasin. However, the amount of water in the Whitewater River Subbasin has decreased over the years due to pumping to serve urban, rural and agricultural development in the Coachella Valley has withdrawn water at a rate faster than its rate of recharge.

The Whitewater River Subbasin is not adjudicated. From a management perspective, the subbasin is divided into two management areas designated the Upper Whitewater River Subbasin Area of Benefit (AOB) and the Lower Whitewater River Subbasin AOB. The dividing line between these two areas is an irregular trending northeast to southwest between the Indio Hills north of the City of Indio and Point Happy in La Quinta. The Upper Whitewater River Subbaisn AOB is jointly managed by CVWD and DWA under the terms of the 1976 Water Management Agreement. The Lower Whitewater River Subbasin AOB is managed by CVWD.

The Whitewater River Subbasin is divided into four subareas: Palm Springs, Thermal, Thousand Palms, and Oasis. The Palm Springs Subarea is the forebay or main area of recharge to the Subbasin and the Thermal Subarea comprises the pressure or confined area within the basin. The other two subareas are peripheral areas having unconfined groundwater conditions.

Palm Springs Subarea

The triangular area between the Garnet Hill Fault and the east slope of the San Jacinto Mountains southeast to Cathedral City is designated the Palm Springs Subarea, and is an area in which groundwater is unconfined. The Valley fill materials within the Palm Springs Subarea are essentially heterogeneous alluvial fan deposits with little sorting and little fine grained material content. The thickness of these water bearing materials is not known; however, it exceeds 1,000 feet. Although no lithologic distinction is apparent from well drillers' logs, the probable thickness of Recent deposits suggests that Ocotillo conglomerate underlies Recent fanglomerate in the Subarea at depths ranging from 300 to 400 feet.

Natural recharge to the aquifers in the Whitewater River and Garnet Hill subbasins occurs primarily in the Palm Springs Subarea. The major natural sources include infiltration of stream runoff from the San Jacinto Mountains and the Whitewater River, and subsurface inflow from the San Gorgonio Pass and Mission Creek Subbasins. Deep percolation of direct precipitation on the Palm Springs Subarea is considered negligible as it is consumed by evapotranspiration.

Thermal Subarea

Groundwater of the Palm Springs Subarea moves southeastward into the interbedded sands, silts, and clays underlying the central portion of the Valley. The division between the Palm

Springs Subarea and the Thermal Subarea is near Cathedral City. The permeabilities parallel to the bedding of the deposits in the Thermal Subarea are several times the permeabilities normal to the bedding and, therefore, movement of groundwater parallel to the bedding predominates. Confined or semi-confined groundwater conditions are present in the major portion of the Thermal Subarea. Movement of groundwater under these conditions is present in the major portion of the Thermal Subarea and is caused by differences in piezometric (pressure) level or head. Unconfined or free water conditions are present in the alluvial fans at the base of the Santa Rosa Mountains, as in the fans at the mouth of Deep Canyon and in the La Quinta area.

Sand and gravel lenses underlying this Subarea are discontinuous and clay beds are not extensive. However, two aquifer zones separated by a zone of finer-grained materials were identified from well logs. The fine grained materials within the intervening horizontal plane are not tight enough or persistent enough to restrict completely the vertical interflow of water, or to assign the term “aquiclude” to it. Therefore, the term “aquitard” is used for this zone of less permeable material that separates the Upper and Lower aquifer zones in the southeastern part of the valley. Capping the Upper aquifer at the surface are tight clays and silts with minor amounts of sands. Semi-perched groundwater occurs in this capping zone, which is up to 100 feet thick.

The Lower aquifer zone, composed of part of the Ocotillo conglomerate, consists of silty sands and gravels with interbeds of silt and clay. It is the most important source of groundwater in the Coachella Valley Groundwater Basin but serves only that portion of the valley easterly of Washington Street. The top of the Lower aquifer zone is present at a depth ranging from 300 to 600 feet below the surface. The thickness of the zone is undetermined, as the deepest wells present in the Valley have not penetrated it in its entirety. The available data indicate that the zone is at least 500 feet thick and may be in excess of 1,000 feet thick.

The aquitard overlying the Lower aquifer zone is generally 100 to 200 feet thick, although in small areas on the periphery of the Salton Sea it is in excess of 500 feet in thickness. North and west of Indio, in an arcuate zone approximately one mile wide, the aquitard is apparently lacking and no distinction is made between the Upper and Lower aquifer zones.

Capping the Upper aquifer zone in the Thermal Subarea is a shallow fine-grained zone in which semi-perched groundwater is present. This zone consists of Recent silts, clays, and fine sands and is relatively persistent southeast of Indio. It ranges from zero to 100 feet thick and is generally an effective barrier to deep percolation. However, north and west of Indio, the zone is composed mainly of clayey sands and silts and its effect in retarding deep percolation is limited. The low permeability of the materials southeast of Indio has contributed to the irrigation drainage problems of the area. Semi-perched groundwater has been maintained by irrigation water applied to agricultural lands south of Point Happy necessitating the construction of an extensive subsurface tile drain system.

The Thermal Subarea contains the division between the upper and lower portions of the Whitewater River (Indio) Subbasin and their respective groundwater tables. Primarily due to the application of imported water from the Coachella Canal, and an attendant reduction in groundwater pumpage, the water table in the area southerly from Point Happy (in La Quinta) rose until the early 1970's, while the water table in the area northerly from Point Happy was dropping. This division forms the lower (southern) boundary of the management area of the Management Agreement between CVWD and DWA. Water table measurements have shown no distinction between the Palm Springs Subarea and the Thermal Subarea. The distinction has been is that in the Thermal Subarea at Point Happy the groundwater levels until recently were stabilized, neither rising nor falling significantly. This is changing as increased pumpage is again lowering the groundwater levels in the lower portion of the Whitewater River (Indio) Subbasin. CVWD recently completed a study to evaluate the entire groundwater basin. This led to the development and adoption of the 2010 CVWMP Update. Using state of the art technology, the District developed and calibrated a peer-reviewed, three-dimensional groundwater model (Fogg 2000) that is based on over 2,500 wells, and includes an extensive database of well chemistry reports, well completion reports, electric logs, and specific capacity tests. This model improved on previous groundwater models and incorporates the latest hydrological evaluations from previous studies conducted by DWR and USGS to gain a better understanding of the hydrogeology in this subbasin and the benefits of water management practices identified in the plan.

Thousand Palms Subarea

The small area along the southwest flank of the Indio Hills is named the Thousand Palms Subarea. The southwest boundary of the Subarea was determined by tracing the limit of distinctive groundwater chemical characteristics. Whereas a calcium bicarbonate water is characteristic of the major aquifers of the Whitewater River (Indio) Subbasin, water in the Thousand Palms Subarea is sodium sulfate in character.

The quality differences suggest that recharge to the Thousand Palms Subarea comes primarily from the Indio Hills and is limited in supply. The relatively sharp boundary between chemical characteristics of water derived from the Indio Hills and groundwater in the Thermal Subarea suggests there is little intermixing of the two waters.

The configuration of the water table north of the community of Thousand Palms is such that the generally uniform, southeast gradient in the Palm Springs Subarea diverges and steepens to the east along the base of Edom Hill. This steepened gradient suggests a barrier to the movement of groundwater, or a reduction in permeability of the water-bearing materials. A southeast extension of the Garnet Hill Fault would also coincide with this anomaly. However, there is no surface expression of such a fault, and the gravity measurements taken during the 1964 DWR investigation do not suggest a subsurface fault. The residual gravity profile across this area supports these observations. The sharp increase in gradient is therefore attributed to lower permeability of the materials to the east. Most of the Thousand Palms Subarea is located within the upper portion of the Whitewater River (Indio) Subbasin. Groundwater levels in this area show similar patterns to those of the adjacent Thermal Subarea, suggesting a hydraulic connectivity.

Oasis Subarea

Another peripheral zone of unconfined groundwater that is different in chemical characteristics from water in the major aquifers of the Whitewater River (Indio) Subbasin is found underlying the Oasis Piedmont slope. This zone, named the Oasis Subarea, extends along the base of the Santa Rosa Mountains. Water bearing materials underlying the Subarea consist of highly permeable fan deposits. Although groundwater data suggest that the boundary between the Oasis and Thermal Subareas may be a buried fault extending from Travertine Rock to the community of Oasis, the remainder of the boundary is a lithologic change from the coarse fan deposits of the Oasis Subarea to the interbedded sands, gravel and silts of the Thermal Subarea. Little information is available as to the thickness of waterbearing materials, but it is estimated to be in excess of 1,000 feet. Groundwater levels in the Oasis Subarea have exhibited similar declines as elsewhere in the Subbasin due to increased groundwater pumping to meet agricultural demands on the Oasis slope.

Summary

The Whitewater River (Indio) Subbasin consists of four Subareas: the Palm Springs, Thermal, Thousand Palms and Oasis Subareas. The Palm Springs Subarea is the forebay or main area of recharge to the Subbasin, and the Thermal Subarea comprises the pressure or confined area within the basin. The Thousand Palms and Oasis Subareas are peripheral areas having unconfined groundwater conditions, which would support groundwater recharge. From a management perspective, the Whitewater River (Indio) Subbasin is commonly divided into an upper and lower portion, with the dividing line extending from Point Happy in La Quinta to the northeast, terminating at the San Andreas Fault and the Indio Hills at Jefferson Street.

For the purpose of this report, the lower portion of the Whitewater River (Indio) Subbasin is defined generally as that portion of the Thermal Subarea east of this line, and the Oasis Subarea.

WATER SUPPLY

Groundwater Storage

In 1964, DWR estimated that the Subbasins in the Coachella Valley Groundwater Basin contained, in the first 1,000 feet below the ground surface, approximately 39,200,000 AF of water. The capacities of the Subbasins are shown in Table 1.

Table 1 Estimated Groundwater Storage Capacity of the Coachella Valley Groundwater Basin		
Area		**Storage[1] (AF)**
San Gorgonio Pass Subbasin		2,700,000
Mission Creek Subbasin		2,600,000
Desert Hot Springs Subbasin		4,100,000
Garnet Hill Subbasin		1,000,000
	Subtotal	10,400,000
Whitewater River (Indio) Subbasin		
Palm Springs Subarea		4,600,000
Thousand Palms Subarea		1,800,000
Oasis Subarea		3,000,000
Thermal Subarea		19,400,000
	Subtotal Whitewater River (Indio) Subbasin	28,800,000
	Total all Subbasins	**39,200,000**

(1) First 1,000 feet below ground surface. CA Dept. of Water Resources estimate (DWR, 1964).

Currently, the Whitewater River (Indio) Subbasin is developed to the point where significant groundwater production occurs. Imported State Water Project water allocations are recharged in the Upper Whitewater River Basin to replace consumptive uses created by the resort-recreation economy and permanent resident population. The imported Colorado River supply through the Coachella Canal is used mainly for irrigation. Annual deliveries of Colorado River water through the Coachella Canal of approximately 300,000 AF are a significant component of southeastern valley hydrology.

Groundwater Levels

Historical water level declines and conditions producing those declines have been extensively described by the USGS and DWR and are documented in the 2010 CVWMP Update.

Although water levels declined throughout most of the Subbasins since 1945, water levels in the southeastern portion of the Valley rose until the early 1970s because of the use of imported water from the Coachella Canal and the resulting decreased pumpage in that area. The rate of groundwater level decline increased since the early 1980s due to increasing urbanization and increased groundwater use by domestic water purveyors, local farmers, golf courses and fish farms.

The historic declining water table in the lower portion of the Whitewater River Subbasin led to the determination that a management program is required to stabilize water levels and prevent other adverse effects such as water quality degradation and land subsidence. Coachella Valley Water District's Lower Whitewater River Subbasin Groundwater Replenishment Program became effective in 2005. Since then, groundwater levels in wells throughout most of the lower portion of the Whitewater River Subbasin have stabilized or are rising.

Water surface elevations in the northwestern area of the valley are highest at the northwest end of each Subbasin, illustrating that regional groundwater flow is from the northwest to the southeast in the center of the Valley.

Figure 2 depicts the groundwater levels for 10 wells that are representative of the lower portion of the Whitewater River Subbasin. The Lower Whitewater River Subbasin Area of Benefit boundary and the locations of the Thomas E. Levy (TEL) Groundwater Replenishment Facility and Martinez Canyon Pilot Recharge Facility are also provided in Figure 2.

Management Area

CVWD manages groundwater in the lower portion of the Whitewater River Subbasin as a separate unit from the upper portion of the Whitewater River Subbasin. This management area consists of the southerly portion of the Thermal Subarea and the Oasis Subarea that have experienced declining groundwater levels since 1980. The Area of Benefit for this management program coincides with the management area.

Lower Whitewater River Subbasin Area of Benefit Boundary

Figure 2 presents the boundary of the Lower Whitewater River Subbasin Area of Benefit. This boundary is defined as follows:

That lower portion of the Whitewater River Subbasin within the boundaries of CVWD, beginning at the northerly extension of Jefferson Street located on the San Andreas Fault, south to Avenue 40, west to Adams Street, south to Fred Waring Drive (Avenue 44), west to Washington Street, south to the Santa Rosa Mountains near Point Happy. The area's western boundary continues south along the foothills of the Santa Rosa Mountains to the southwest corner of section 25, township 7 south, range 7 east, thence to the southwest corner of section 36, township 8 south, range 8 east, which is approximately 3 miles due west of Travertine Rock. The boundary continues east along the Riverside County line to the southeast corner of section 34, township 8 south, range 9 east, which is inundated by the Salton Sea. The boundary continues northeasterly across the Salton Sea to the northeast corner of section 34, township 7 south, range 10 east, thence northwesterly along the San Andreas Fault to the point of beginning.

Groundwater Production

As presented in the 2002 Coachella Valley Water Management Plan, groundwater production within the Lower Whitewater River Subbasin Area of Benefit was estimated to be 168,300 AF per year (AF/yr) during 1999. Table 2 presents the estimated 2011 groundwater production for the lower portion of the Whitewater River Subbasin.

When the Replenishment Assessment was adopted in June 2004, the CVWD Board of Directors required groundwater producers to report their groundwater production. The reported production for 2011 was 116,890 AF. CVWD estimates that about 28,000 AF of production was not reported by groundwater producers as required by the State Water Code. The total estimated production for 2011 is 145,000 AF.

Table 2 Estimated Groundwater Production Within the Lower Whitewater River Subbasin Area Benefit

Year	Acre-feet
1999[1]	168,300
2002[2]	166,700
2003	199,800
2004	172,300
2005	172,000
2006	172,000
2007	172,000
2008	172,000
2009	160,000
2010	150,000
2011	145,000[3]

(1) From the 2002 CVWMP, Table 3-2, Summary of Historical Water Supplies in 1936 and 1999.
(2) 2002 through 2010 based on Table 2, Engineer's Report on Water Supply and Replenishment Assessment, Lower Whitewater River Subbasin Area of Benefit 2011-2012.
(3) Assessable groundwater production estimated from reported and projected unreported groundwater production.

Groundwater Inflows and Outflows

Total inflows and outflows to the Lower Whitewater River Subbasin Area of Benefit for the year 2011 are summarized in Table 3. The natural inflow of 28,000 AF/year includes natural recharge and flow across Subbasin boundaries. The nonconsumptive return of applied water is estimated at 143,641 AF, which is the sum of 35 percent of the estimated annual groundwater production and 35 percent of Colorado River water applied for irrigation within the Area of Benefit during 2011. The total inflow includes the natural inflow, the nonconsumptive return, and the 32,417 AF of actual water recharged by CVWD at the recharge facilities. The total outflow is the groundwater production estimate plus 68,147 AF/year of subsurface drainage. The annual balance is the total inflow less the total outflow for a loss of 9,116 AF of water in storage in the Subbasin.

Table 3 Calculation of Overdraft in the Lower Whitewater River Subbasin[1]		
Item	**Annual Calculation (AF)**	**Total Overdraft (AF)**
Overdraft through 2010[2]		4,532,109
Production Estimate	-145,000	
Non-consumptive return[3]	143,641	
Natural inflow[4]	28,000	
Flows to drains[5]	-68,174	
Groundwater replenishment[6]	32,417	
Annual balance[7]	-9,116	
Cumulative overdraft through 2011		4,541,225

(1) Based on 65% consumptive use and some flow to drains.

(2) Overdraft accumulated since 1936 based on previous Engineer's Report on Water Supply and Replenishment Assessment, Lower Whitewater River Subbasin, May 2011.

(3) Based on 35% of production plus Colorado River water applied for irrigation in the AOB.

(4) Includes 21,000 AFY natural recharge and 7,000 AFY flow across Subarea boundaries.

(5) Subsurface drainage.

(6) TEL Facility received 32,250 AF and the Martinez Canyon Facility received 167 AF.

(7) This is a decrease in stored groundwater, equal to 0.03 percent of the Subbasin's storage capacity.

Overdraft

Groundwater overdraft is manifested not only as a prolonged decline in groundwater storage but also through secondary adverse effects including decreased well yields, increased energy costs, water quality degradation, and land subsidence. The 2010 CVWMP Update defines overdraft as the calculated change in storage based on long-term local hydrology and imported water deliveries. The California Department of Water Resources California Water Plan Update 2009 defines overdraft as the condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average conditions.

In 2011, the annual water balance for the Lower Whitewater River Subbasin was negative, providing an increase in the cumulative overdraft. Imported water may offset groundwater overdraft in a particular year. However, on a long-term basis, water requirements are likely to continue to place demands on groundwater storage. The 2010 CVWMP Update outlines a plan to eliminate long-term overdraft in the Coachella Valley.

Based on the water balance information presented in Table 3, the Lower Whitewater River Subbasin experienced a loss of 9,116 AF of water storage during 2011. It should be noted that overdrafting the groundwater basin may allow poor quality water from irrigation return and the Salton Sea to replace fresh water storage. Since 1936, the cumulative overdraft of the lower portion of the Whitewater River Subbasin is approximately 4.5 million AF.

An ongoing groundwater replenishment program is necessary to continue to reduce declining groundwater levels and to avoid any detrimental conditions that would otherwise occur.

REPLENISHMENT PROGRAM

Current Recharge Activities

Two direct recharge programs are currently operating in the Lower Whitewater River Subbasin Area of Benefit. The *Thomas E. Levy Groundwater Replenishment Facility* (TEL Recharge Facility) is located just south of Lake Cahuilla at Dike 4, a major flood control dike, near Avenue 62 and Madison Street. This location appears to be ideally suited for a large-scale recharge facility for the Thermal Subarea, given its proximity to Lake Cahuilla and its relative freedom from aquitards.

In 2011, CVWD recharged 32,250 AF/year at this location. Since 1997, 114,984 AF of water has been recharged at the TEL Recharge Facility.

CVWD completed construction of a pilot recharge facility and several monitoring wells on the Martinez Canyon alluvial fan in March 2005. This facility is designed to recharge approximately 4,000 AF/year and received 167 AF of recharge water in 2011. The annual amounts of water delivered for recharge at the TEL Recharge Facility and Martinez Canyon Pilot Recharge Facility are shown in Table 4.

Table 4	Lower Whitewater River Subbasin Annual Recharge Deliveries
Calendar Year	**Recharge Delivery (AF/year)**
1997	415
1998	1,364
1999	2,802
2000	1,813
2001	3,572
2002	2,360
2003	1,671
2004	3,450
2005	4,743
2006	2,648
2007	5,775
2008	7,473
2009	21,735
2010	37,401
2011	32,417
Total	**129,639**
Reference: CVWD billing records.	

Monitoring Wells

Nine monitoring wells were installed near TEL Recharge Facility in 1995 and are monitored quarterly for water quality and changes in water table elevation. Of these nine wells, four are shallow (176-315 feet), five are deep (543-740 feet), and are located both up and down-gradient of the original pilot ponds along Avenue 62.

Nine new monitoring wells were installed near TEL Recharge Facility in 2009. Six wells are nested together in groups of two (one shallow and one deep) down-gradient of the facility, parallel to Dike 4. Three additional shallow monitoring wells are installed down-gradient of the facility at existing CVWD sites. The new monitoring wells are used to evaluate water quality and depth to water table, along with the original monitoring wells.

Monitoring wells at the Martinez Canyon Pilot Recharge Facility were installed in 2001-2002 and are used to monitor water quality and water table elevation data. These wells range from a depth of 380 to 420 feet and are located down-gradient of the pilot ponds along Avenue 72.

Monitoring wells are also used to evaluate intrusion into the fresh water aquifer by water from the Salton Sea. CVWD has been studying this potential problem since 1996 using a multiple zone monitoring well near Lincoln Street on the northwest end of the Salton Sea. This well allows the evaluation of water level and quality at four different depths below the ground surface. During 2002, CVWD completed construction of two additional multiple zone monitoring wells near Avenue 78 on the west side of the Salton Sea. Each monitoring well allows measurements from two aquifer zones in the Oasis area. Monitoring data for these wells from 2004 indicated water levels in the shallower aquifers ranged from 25 feet to 70 feet below the elevation of the Salton Sea. Current monitoring data shows water levels have increased to 15 feet below to 20 feet above the elevation of the Salton Sea.

Data from these monitoring wells also show that the water levels in the primary production aquifers are increasing. The depth to water in 2004 in the primary production aquifer was 40 to 100 feet below the ground surface. Current water levels at the multiple zone monitoring well near Lincoln Street range from 35 feet below ground surface to flowing-artesian conditions.

Many areas of the Lower Whitewater River Subbasin Area of Benefit have shallow semi-perched groundwater conditions. Since groundwater levels in this perched aquifer are typically 8 to 10 feet below ground surface (controlled by agricultural drains), there can be a downward vertical gradient between the perched aquifer and the primary production zone. Salts that accumulate in the semi-perched zone from irrigation use can migrate slowly through the aquitard into the deeper aquifers thereby degrading the water quality. Rising water levels in the primary production aquifer, displayed in recent data collected at the multiple zone monitoring wells, reduces the likelihood of salt water intrusion into the fresh water aquifer.

Recharge Facilities

CVWD brought the TEL Recharge Facility on-line in June, 2009. The 2010 CVWMP Update recommends a goal of 40,000 AF/year at this facility. CVWD recharged 32,250 AF at this location in 2011.

The 10 hydrographs provided in Figure 2 are some of 206 wells monitored in the Lower Whitewater River Subbasin Area of Benefit by CVWD staff. The average rise in water levels observed in these monitored wells during last year was 4.4 feet.

Early benefits of recharge from TEL Recharge Facility to the lower aquifer are observed in measurements collected from monitoring wells near the facility. The 18 monitoring wells located at the TEL Recharge Facility provide representative monitoring of the preliminary effects of the recharge efforts. The nine original monitoring wells at the TEL Recharge Facility show an average water level increase of 9.0 feet during 2011. Eight of nine new monitoring wells installed in mid-2009 show an average water level increase of 48.5 feet from the time of installation through January 2012, and a 2.4 foot average increase in 2011.

One of the nine new monitoring wells installed in 2009 was installed into the upper perched aquifer. Water levels observed in this well increased less than 1 foot in 2011. The shallow monitoring well seems unaffected by recharge to the deep aquifer.

Figure 2, Graph 2d, shows a hydrograph for a production well one mile downstream of TEL Recharge Facility, State Well Number 07S07E03A01S. The annual average water level in this well increased from 95 feet below ground surface in 2009 to 47 feet in 2011.

CVWD is evaluating the need and feasibility of constructing a full-scale recharge facility on the Martinez Canyon alluvial fan. The 2010 CVWMP Update recommends a recharge goal of 20,000 to 40,000 AF/year at this facility. The first phase of the larger facility is anticipated to be fully operational in about 5 years.

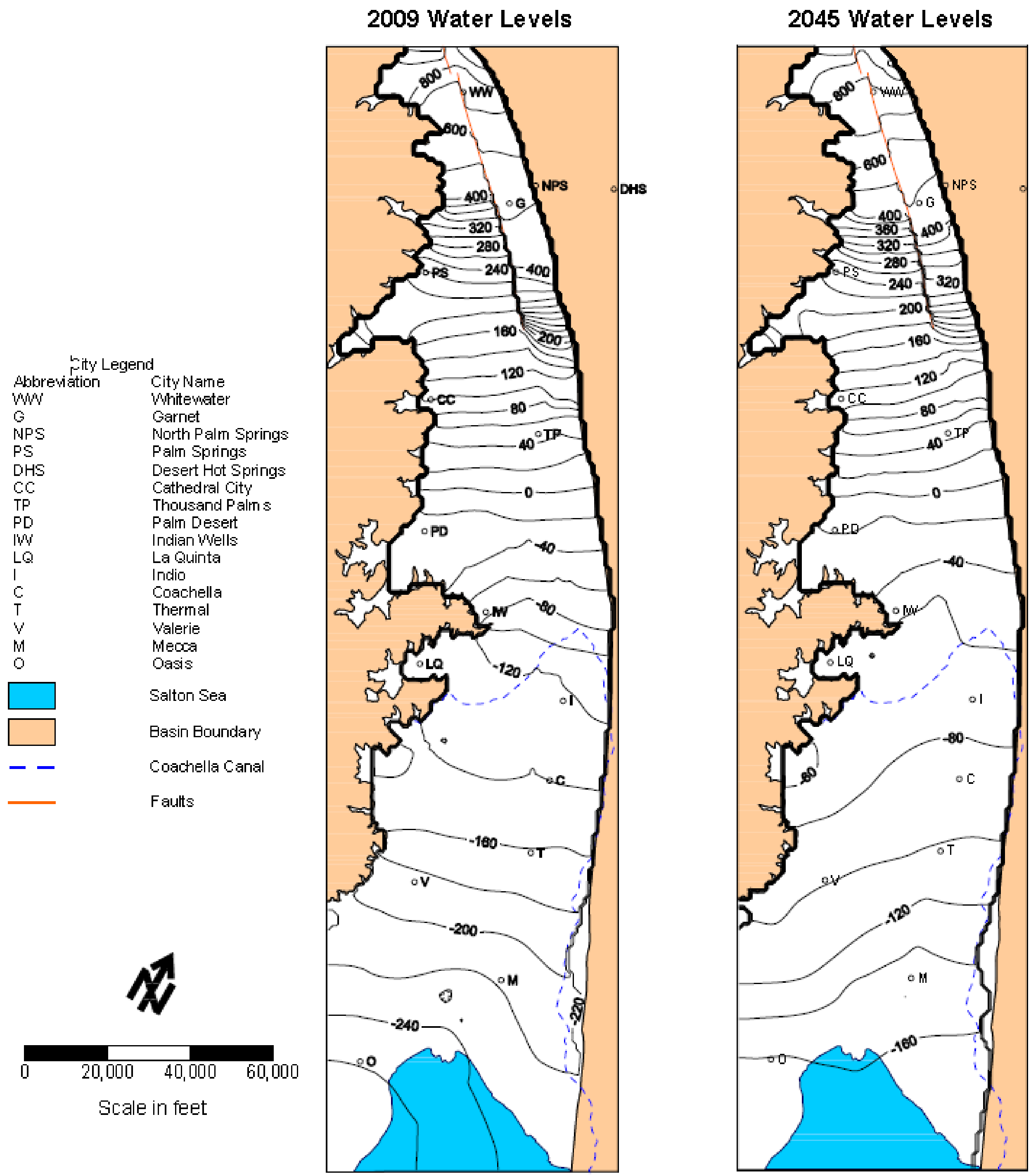
In addition to the direct recharge facilities described above, CVWD plans to provide nonpotable water (imported water and recycled water) to replace groundwater pumping as identified in the 2010 CVWMP Update. These programs include construction of a canal water distribution system in the Oasis area that will serve users located within CVWD's Improvement District No. 1 (ID-1), the contractually designated area that is eligible to receive canal water. CVWD will also work with groundwater users such as farmers, golf courses and other users to encourage the use of nonpotable water. Urban irrigation will use nonpotable water as development progresses within this subbasin. These programs are being developed and will be implemented over the next thirty years.

Future Recharge Activities and Recharge Model Projections

The extent of the Area of Benefit for the Lower Whitewater River Subbasin Management Area was determined during the course of preparation of the 2010 CVWMP Update and its associated PEIR that required extensive computer modeling of the Whitewater River Subbasin. The groundwater model allowed CVWD to gain a better understanding of water conditions in this subbasin and the benefits of water management activities identified in the 2010 CVWMP Update.

Figure 3 presents the projected change in groundwater levels in 2009 and 2045, during implementation of the 2010 CVWMP Update project (80,000 AFY in the Lower Whitewater River Subbasin Area of Benefit). Implementation of the project results in water levels that are 40-60 feet higher in the La Quinta area, and about 90 feet higher in the Oasis area than current water levels.

Figure 3 **Whitewater River Subbasin - Change in Water Levels from 2009 to 2045**



Contours represent feet above MSL

MWH
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Figure 3
Projected Lower Aquifer Groundwater Contours for 2010 WMP Update
2009 - 2045

Other Replenishment Activities

Replenishment programs are also under way in the Mission Creek Subbasin and the upper portion of the Whitewater River Subbasin. These programs are described in separate Engineer's Reports.

REPLENISHMENT ASSESSMENT

State Water Code

Sections 31630 through 31639 of the State Water Code authorize CVWD to levy and collect water replenishment assessments for the purpose of replenishing groundwater supplies within CVWD boundaries. The code defines production, producer, and minimal pumper for replenishment purposes as follows:

"Production" or **"produce"** means the extraction of ground water by pumping or any other method within the boundaries of the district or the diversion within the district of surface supplies which naturally replenish the ground water supplies within the district and are used therein.

"Producer" means any individual, partnership, association or group of individuals, lessee, firm, private corporation, or any public agency or public corporation, including, but not limited to, the Coachella Valley Water District.

"Minimal pumper" means any producer who produces 25 or fewer AF in any year.

The replenishment assessment is based on groundwater production within the lower portion of the Whitewater River Subbasin within the boundaries of CVWD and is limited to the Area of Benefit.

Production by minimal pumpers is exempt from assessment. The number of minimal pumpers in the Area of Benefit is currently unknown. CVWD has an ongoing program to conduct a thorough field investigation of the use of all wells. Minimal pumpers predominantly pump water from small wells that are used for domestic or limited irrigation purposes.

The code defines "replenishment assessment" and it states that assessments may be levied upon all water production within the Area of Benefit, provided the assessment charge is uniform throughout said Area of Benefit. The Replenishment Assessment Charge is a monetary charge authorized by the State Water Code and uniformly applied to extractions of groundwater within certain specified geographic boundaries of CVWD for payments of an imported or recycled (reclaimed) water supply purchased to supplement naturally existing water supplies. Charges for the water supply are limited to certain specified costs.

In the initial twelve years of the Upper Whitewater River Subbasin replenishment program, only certain portions of the SWP costs could be included in the Replenishment Assessment Charge calculation. However, in 1991 the legislature passed and the governor signed into law AB 1070.

This bill allowed additional costs including the cost of importing and recharging water from sources other than the SWP and the cost of treating and distributing recycled water. The Replenishment Assessment Charge considered in this report is based on the most recent and reliable information available with respect to applicable costs or charges.

CVWD has incurred additional costs associated with the replenishment program, which include previous engineering studies and monitoring well construction, maintenance and monitoring. These costs and the cost of treating and distributing recycled water are not currently included in determining the RAC.

Replenishment Water Costs

SWP water (Table A Amount) is not currently used for recharge in the lower portion of the Whitewater River Subbasin as all of the existing Table A Amount is used for replenishment of the upper portion of the Whitewater River Subbasin and the Mission Creek Subbasin. There is no conveyance facility to directly deliver SWP water to the lower valley.

Replenishment water for the lower portion of the Whitewater River Subbasin groundwater replenishment program comes from CVWD's Colorado River water contract and the Quantitative Settlement Agreement. Colorado River Water available for groundwater recharge includes the following block amounts:

Base Allotment		301, 000 AF
1988 MWD/IID Approval Agreement		20,000 AF
IID to CVWD-First Transfer		50,000 AF
IID to CVWD-Second Transfer		53,000 AF
MWD Transfer		<u>35,000 AF</u>
	Total	459,000 AF

The Colorado River Water cost varies as to which block the water is derived. Agricultural customers have the first priority of the base allotment. Groundwater replenishment water will then come from any remaining base allotment and the subsequent blocks.

Previous Replenishment Costs

Since the establishment of the replenishment assessment program for the Lower Whitewater River Subbasin Area of Benefit in June 2004, CVWD has incurred costs for development and operation of the TEL Recharge Facility and the Martinez Canyon Pilot Recharge Facility as indicated in its financial records. These costs consist of: (1) canal water costs, (2) power costs, (3) engineering, construction, operation and maintenance of the TEL recharge pilot facility, (4) engineering for the development of the full-scale TEL Recharge Facility and (5) engineering, construction, operation and maintenance of the Martinez Canyon Pilot Recharge Facility. These costs are included in the calculation of the RAC for Fiscal Year 2012-2013.

Proposed Replenishment Costs

Historical capital and operating costs are utilized to develop the proposed RAC for Fiscal Year 2012-2013 and are described below and presented in Table 5.

TABLE 5

COACHELLA VALLEY WATER DISTRICT

LOWER WHITEWATER RIVER SUB BASIN AREA OF BENEFIT

REPLENISHMENT ASSESSMENT RATE FOR FISCAL YEAR 2012-2013

ALLOWABLE COSTS	TOTAL COSTS		REPLENISHMENT ASSESSMENT 2011-12	REPLENISHMENT ASSESSMENT 2012-13
TEL Recharge Facility O&M Costs (1)	615,908.00		2.52	**4.25**
Martinez Canyon Recharge Facility O&M Costs (1)	3,237.00		0.15	**0.02**
Total O&M Costs	$ 619,145.00		$ 2.67	**$ 4.27**
Amortized Costs:				
Capital - TEL (2) & Martinez Canyon	2,159,767.33		14.54	**14.89**
Uncollected RAC for Production from first year (4)	$46,135.53		0.31	**0.32**
RAC, Assessed vs. Assessable (7)	640,436.58		2.12	**4.42**
Colorado River Costs (3)	2,861,918.00		22.76	**19.74**
Power Costs	919,223.00		7.16	**6.34**
Administrative Costs (5)	458,202.00		1.78	**3.16**
Estimated Allowable Replenishment Assessment	$ 7,704,827.44			
Assessable Production (Acre-Feet) (6)	**145,000**	**AF**		
Preliminary Calculated Assessable Rate per Acre-Foot			$ 51.34	**$ 53.14**
Total Calculated Assessable Rate per Acre-Foot			$ 51.34	**$ 53.14**
% Change in Total Calculated Assessable Rate	% Change			**3.5%**
Actual Assessed Rate in Prior Year				
Proposed Assessed Rate this year (Increased by $7 from Previous Year)			$ 31.00	**$ 38.00**
% Change in Assessed Rate 11/12 to 12/13	% Change			**22.6%**

NOTES:

(1) Operations and maintenance (O&M) costs include labor, equipment, and materials for TEL & Martinez Canyon Recharge - Facilities. This is a five year average.

(2) Includes 48" pipeline, land, pump station, piping and recharge basin construction costs for TEL. These costs are amortized according to the schedules provided. $56,000,000 amortized over 20 and 30 years.

(3) Colorado River water costs for fiscal year 2012-2013 are based on actual calendar year 2011 recharge at the two facilities (32,416.5 AF @ $88.2858 Blended Rate.

(4) Although RAC was imposed effective July 1, 2004, collection did not begin until January 1, 2005. This figure is half of the estimated Area of Benefit production multiplied by the set rate of $4.86 per acre-foot, amortized over 10 years.

(5) Annual 2011 cost to administer the replenishment assessment program includes personnel, meter reading, investigation, report preparation, and billing.

(6) The replenishment assessment rate is determined by dividing costs by 145,000, which represents the annual groundwater production in acre feet within the Lower Whitewater River Sub basin Area of Benefit for calendar year 2011.

(7) Cumulative assessable costs (calculated RAC times acre feet produced) vs. amount assessed (actual RAC times acre feet produced), for all years except 2008, amortized for 10 years.

CVWD conducted land acquisition, engineering, design and initiated construction of the full-scale TEL Recharge Facility in 2008. Capital expenditures of approximatley $26 million that were previously deferred are included in the amount listed for calendar year 2008. Calendar year 2009 includes captial expenditures for construction costs, monitoring wells, telemetry, and environmental monitoring. Calendar year 2011 includes no captial expenditures. The following capital expenditures have been included in the assessment rate calculation:

Year 2005	$1,283,666
Year 2006	$1,597,657
Year 2007	$0
Year 2008	$34,427,011
Year 2009	$12,976,680
Year 2010	$0
Year 2011	$0
Total	$50,285,013

Construction of the Martinez Canyon Pilot Recharge Project was completed in March 2005. The following capital expenditures have been included in the RAC calculation.

Year 2004	$5,500,000
Year 2005	$340,947
Year 2006	$61,655
Year 2007	$0
Year 2008	$0
Year 2009	$0
Year 2010	$0
Year 2011	$0_
Total	$5,902,602

The above-referenced capital expenditures for 2005 and 2006 are being amortized over a 20 year period, whereas capital expenditures for 2008 and 2009 are being amortized over a 30 year period. The amortized portion for 2012 is $2,861,918.

The operating costs for the TEL Recharge Facility and Martinez Canyon Pilot Recharge Facility during 2011 totaled $619,145 and include spreading area operations and maintenance (O&M) costs based on a historical five year average.

The cost for Colorado River water used for recharge during 2011 totaled $2,861,918[1] for 32,417 AF of total recharge plus gate charges. The cost of power used for recharge during 2011 was $919,223.

In 2011, CVWD incurred $458,202 for engineering and administrative costs for the implementation of water management activities in the Lower Whitewater River Subbasin Area of Benefit. These costs include personnel and materials for meter reading, billing, groundwater monitoring and report preparation.

The replenishment assessment program was imposed effective July 1, 2004; however, collection of assessments did not begin until January 1, 2005. Consequently, no assessments were collected on one-half of the estimated Fiscal Year 2004-2005 production (86,000 AF). This delayed assessment for the first year amounted to $417,960 at the adopted rate of $4.86 per acre-foot and has been amortized over 10 years. The amount for 2012 is $46,136.

Assessed Production

As indicated in the 2010 CVWMP Update individual production within the Lower Whitewater River Subbasin Area of Benefit is not known with certainty. However, total estimated production was developed as part of the 2010 CVWMP Update. This estimated production was based on data developed from metered production records and evaluations of consumptive use by crops and other irrigation uses of groundwater for the 2010 CVWMP Update. Estimated production reflected in Table 2 is based on revised estimates of consumptive use by crops and other irrigation uses of groundwater. The assessed production for 2012 is estimated to be 145,000 AF/year.

Producers within the lower portion of the Whitewater River Subbasin are listed in Table 6, together with their estimated production and their total estimated replenishment assessment.

Methods for Determining Production

In accordance with Section 31638.5 of the California Water Code, Producers are required to have water-measuring devices installed on all wells or other water producing facilities within one year following the levy of a replenishment assessment. Minimal pumpers are exempt from this provision.

Producers shall submit a water production statement on a CVWD approved form with their RAC payment each month or enter into a Water Production Metering Agreement with CVWD to have CVWD staff measure and report groundwater production.

1. In 2011, $2,844,731 for 32,250 AF of recharge at TEL and $17,187 for 167 AF of recharge at Martinez Canyon. Estimate includes Coachella Canal Quagga Mussel Control Emergency Chlorination Project fee of $5.75/AF.

If no statment of production is furnished, CVWD will calculate production based on energy consumption records (in kilowatt-hours) and the results of well pump tests indicating unit energy consumption per acre-foot of production (in kilowatt-hours per acre-foot).

If no energy consumption records are available, CVWD will compute the groundwater pumping based on consumptive use of water. Consumptive use will be computed by multiplying the irrigated acreage for each crop type using CVWD's zanjero maps of cropping patterns (conducted semi-annually) by a water consumption factor for each crop. The water consumption factor will be based on published crop evapotranspiration requirements, an allowance for leaching and an irrigation efficiency of 70 percent. Other water consumption factors will be used to compute production not used for irrigation. Production will be computed by subtracting any metered deliveries of Canal water or recycled water.

If the total metered, estimated or computed annual amount of production for any producer is 25 AF or less, that entity will be designated a minimal pumper and will be exempt from the RAC for that year. Minimal pumpers will be re-evaluated as necessary.

Replenishment Assessment Charge

The RAC per acre-foot is based on the calculations in Table 5. The RAC for Fiscal Year 2012-2013 is based on the replenishment costs of $7,704,827. The calculated Replenishment Assessment Charge is $53.14 per acre-foot. This charge includes $46,136 to recover charges from Fiscal Year 2004-2005 that were deferred to future years. The Fiscal Year 2012-2013 calculated RAC is 15 percent higher than the calculated RAC for Fiscal Year 2011-2012 and 48 percent higher than the assessed RAC for Fiscal Year 2011-2012. Costs associated with the construction and operation of future facilities will be recovered in the assessment when those costs are incurred.

The Joint Water Policy Advisory Committee (JWPAC) for the Lower Whitewater River Subbasin Area of Benefit, which includes representatives from groups of stakeholders within the Area of Benefit, recommends limiting the increase of the RAC for the period beginning July 1, 2012 to $38.00 per acre-foot, 23 percent higher than the RAC for Fiscal Year 2011-2012. Actual costs not recovered by this reduced RAC will be amortized and recovered during future years to provide a more gradual increase in the rate over time.

Table 6 Lower Whitewater River Subbasin Area of Benefit Estimated Producer Replenishment Costs for 2012

Producer's Name	Estimated Production Acre Feet(1)	Estimated Assessment Dollars(2)
53 & JACKSON	26.8	$1,018
AMEZCUA, OSCAR	33.3	$1,265
ANDALUSIA GOLF CLUB AT	641.0	$24,358
ANTHONY VINEYARDS/FLAME KING	7,041.3	$267,569
AQUA FARMING TECHNOLOGY	1,422.2	$54,044
ARTESIAN ACRES INC.	25.9	$984
ARZ, INC.	961.7	$36,545
BARAJAS, JOHN H.	82.4	$3,131
BARAQUIA, NELSON	764.7	$29,059
BERMUDA DUNES AIRPORT	137.0	$5,206
BERMUDA DUNES COUNTRY CLUB	1,374.3	$52,223
BERMUDA PALMS MOBILE PARK	46.5	$1,767
BOE DEL HEIGHTS MUTUAL WATER	175.0	$6,650
BREECH TRUST	755.7	$28,715
BRIGHTON DISTRIBUTING, INC.	302.0	$11,475
C.V. PUBLIC CEMETERY DISTRICT	252.3	$9,587
CAL-SUNGOLD INC.	66.3	$2,519
CARLAU, LLC	164.3	$6,243
CARVER TRACT MUTUAL WATER CO	115.4	$4,385
CENTRAL COAST GREENHOUSES, INC	308.0	$11,704
CHAC CHUO FARMS INC/AAA FARMS	781.0	$29,678
CITY OF COACHELLA	7,227.5	$274,645
CITY OF INDIO/INDIO WATER AUTH	22,167.2	$842,354
CITY OF INDIO/MUNICIPAL GOLF	60.9	$2,314
COACHELLA VALLEY UNIFIED SCH	370.4	$14,075
COACHELLA VALLEY WATER	27,178.4	$1,032,779
COCOPAH NURSERIES INC	876.9	$33,322
COLDWATER RANCH DUCK CLUB INC	154.1	$5,856
COLORAMA WHOLESALE NURSERY	56.3	$2,139
CRYSTAL ORGANIC FARMS LLC	1,183.3	$44,965
DASHUN FISHERIES	1,522.3	$57,847
DESERT MIST FARMS/MECCA III	160.0	$6,080
DESERT PRODUCE, LLC	29.0	$1,103
DORSEY FAMILY GROVES LLC	522.5	$19,855
DURBANO, DAVID & LINDA	48.0	$1,824
EAST OF MADISON LLC	1,548.7	$58,851
EMPIRE II, LLC	100.4	$3,814

Table 6 Lower Whitewater River Subbasin Area of Benefit Estimated Producer Replenishment Costs for 2012		
Producer's Name	**Estimated Production Acre Feet(1)**	**Estimated Assessment Dollars(2)**
FAJARDO, GERARDO D.	37.0	$1,406
FISH A BIT RANCH	39.9	$1,516
GIDDYUP PROPERTIES, LLC	27.0	$1,026
GRANITE CONSTRUCTION COMPANY	256.2	$9,736
HERBTHYME FARMS, INC.	445.6	$16,933
HERITAGE PALMS MASTERS H.O.A.	143.0	$5,434
INDIAN PALMS COUNTRY CLUB	1,220.2	$46,368
INDIAN SPRINGS GOLF CLUB	548.8	$20,854
JCM FARMING	123.0	$4,674
JEULE I, LLC/HOWARD MARGULEAS	197.5	$7,505
JORDAN OUTREACH MINISTRIES INT	26.1	$992
KARAHADIAN RANCHES INC.	54.3	$2,063
KOHL RANCH COMPANY, LLC	197.6	$7,508
KSL 11 MANAGEMENT OPERATIONS	2,754.5	$104,671
LA QUINTA COUNTRY CLUB	904.2	$34,360
LAGUNA DE LA PAZ HOA	305.0	$11,590
LANE, DONA K.	49.0	$1,862
LANE, STEVEN L.	417.8	$15,876
LEJA FARMS	59.8	$2,272
LO, ERNEST AND TRACY	250.0	$9,500
LONG LIFE FARMS INC./VONG, KEN	1,432.0	$54,416
MECCA LAND DEVELOPMENT CO.	421.6	$16,021
MOTORCOACH COUNTRY CLUB	215.0	$8,170
MOUNTAIN VIEW COUNTRY CLUB	553.8	$21,044
MRBL, LTD.	251.8	$9,568
MYOMA DUNES WATER COMPANY	4,473.2	$169,983
NI CHING HSIANG FISH FARMS	99.1	$3,766
NORTH SHORE GREENHOUSES, INC.	634.2	$24,100
NORTH SHORE RANCH, LLC	201.1	$7,642
OASIS DATE GARDEN	113.2	$4,302
OASIS GARDENS, LLC	224.8	$8,542
OASIS PALMS RV PARK	42.3	$1,607
OLE FO RANCH	418.4	$15,899
OUTDOOR RESORTS INDIO HOA	40.5	$1,539
PALM ROYALE COUNTRY CLUB HOA	540.6	$20,543
PETER RABBIT FARMS	1,683.3	$63,965
PLANTATION GOLF CLUB	259.9	$9,876
PRIME TIME INTERNATIONAL	144.5	$5,491

Table 6 Lower Whitewater River Subbasin Area of Benefit Estimated Producer Replenishment Costs for 2012

Producer's Name	Estimated Production Acre Feet[1]	Estimated Assessment Dollars[2]
RANCHO CASA BLANCA HOA	190.1	$7,224
RANCHO LEMUS	66.7	$2,535
RANCHO TEN	435.9	$16,564
RED GLOBE	364.3	$13,843
RICHARD BAGDASARIAN, INC.	758.1	$28,808
SHADOW HILLS GOLF CLUB	336.6	$12,790
SHIELDS DATE GARDENS	53.8	$2,044
SUN WORLD INTERNATIONAL LLC	1,340.0	$50,920
SUNRISE MARSH LLC	121.7	$4,625
SUNSET RANCH LLC	267.9	$10,179
SWEET DESERT LEMONS	298.6	$11,347
TD DESERT DEV/RANCHO LA QUINTA	1,392.0	$52,896
TERRA LAGO COMMUNITY ASSOC.	168.0	$6,384
THE HIDEAWAY	155.3	$5,901
THE PALMS GOLF CLUB	651.2	$24,746
THE QUARRY AT LA QUINTA	1,128.8	$42,894
THERMICULTURE MGMT LLC	2,910.8	$110,611
TLQ PARTNERS, INC.	544.0	$20,672
TRADITIONS GOLF CLUB	951.0	$36,138
TRI COLOR FARMS, LLC	570.7	$21,687
UNIVERSITY CALIF OF RIVERSIDE	3,547.3	$134,797
VONG, SI SAP/SS VONG FISH FARM	573.0	$21,774
WALLER TRACT MUTUAL WATER	100.7	$3,827
WESTERN AQUATIC ENTERPRISES	764.8	$29,062
YONEMITSU PROPERTIES LP	219.9	$8,356
YOUNG, WILLIAM & HARRIET	358.8	$13,634
YOUNG'S NURSERY, LLC	131.5	$4,997
Total Reported Assessable Production	116,890.2	$4,441,828
Total Non-Reported Assessable Production [3]	28,110	$1,068,172
Total Projected Assessable Production	145,000	$5,510,000

(1) Estimated production based on preceding calendar year reported production.
(2) Production times $38.00 per acre foot. Totals are rounded to the nearest dollar.
(3) The Projected Assessable Production less the Reported Assessable Production.

CONCLUSIONS AND RECOMMENDATION

Because the average natural water inflow into the lower portion of the Whitewater River Subbasin is less than the production, the replenishment program using imported water must be continued and enhanced. Therefore, it is recommended that the RAC of $38.00/AF be levied upon all producers within the Area of Benefit in accordance with the State Water Code.

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