Receipt # 4155 19

DATE FILED & POSTED

NOTICE OF EXEMPTION

To:
San Bernardino County Clerk
Hall of Records Building, First Floor
222 W. Hospitality Lane
San Bernardino, CA 92415

Kern County Clerk
1115 Truxtun Avenue
Bakersfield, CA 93301

From:
San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, CA 92408

CLERK OF THE BOARD
OCT 07 2011
COUNTY OF
SAN BERNARDINO

Project Title: Water Banking and Water Supply Reliability Program with Kern Delta Water District

Location -- Specific: Counties of Kern and San Bernardino, within service areas of Kern Delta Water District and San Bernardino Valley Municipal Water District

Description of Nature, Purpose, and Beneficiaries of Project: San Bernardino Valley Municipal Water District (hereinafter, "Valley District") proposes to bank State Water Project water in banking facilities operated by the Kern Delta Water District (hereinafter, "Kern Delta") for later withdrawal and use within Valley District. Under the program, the Valley District will bank up to 30,000 acre-feet of the water it would otherwise be allocated during the 2011-2012 water year pursuant to Table "A" of its State Water Project contract in existing water banking facilities operated by the Kern Delta. Diversions to the water banking facilities will be made through existing water conveyance facilities and will occur during the period between October 2011 and February 2012. Under the proposal, Kern Delta will, at Valley District's request, return up to 5,000 acre-feet per year to Valley District through existing conveyance facilities during or after the 2011-12 water year.

The proposal is consistent with and included within the scope of Kern Delta's 2002 Final Environmental Impact Report ("FEIR") for its Groundwater Banking And In-Lieu Water Supply Project (State Clearinghouse # 2001011103), which addressed the environmental impacts of the use of Kern Delta's facilities for the banking of up to 213,000 acre-feet by other water agencies, such as Valley District. Because Valley District's proposal involves making use of presently-unused capacity of the California Aqueduct, other State Water Project facilities, and Kern Delta's conveyance and banking facilities, all of which were indentified in Kern Delta's FEIR as facilities that would be used to bank water, the project represents the use of existing facilities within the limits established by applicable legal requirements. Moreover, the environmental effects, if any, of the project were fully analyzed in Kern Delta's FEIR, and the project does not alter the conclusions of the 2002 FEIR.

Name of Public Agency Approving or Carrying Out Activity: San Bernardino Valley Municipal Water District

Finding of Exempt Status:

☒ Categorical Exemption. CEQA Guidelines § 15301 (Existing Facilities)

Reasons why activity is exempt:

The project is exempt from CEQA review pursuant to 14 Cal. Code Regs. § 15301 (Existing Facilities) because the proposal is for the banking and recovery of up to 30,000 acre feet of water delivered pursuant to an existing long term State Water Project contract through existing water conveyance facilities to and from existing water banking facilities. The overall program for water banking by Kern Delta (of which this banking project is a small part) was previously analyzed under CEQA and any significant effects on the environment were fully mitigated.

Agency Contact Person: Douglas Headrick **Telephone**: (909) 387-9200

Signature: Douglas D Headrick **Date:** 10/7/2011

Douglas Headrick

Title: General Manager

☑ Signed by Public Agency

☐ Signed by Applicant

Date received for filing by County Clerk:

State of California—The Resources Agency
DEPARTMENT OF FISH AND GAME

2011 ENVIRONMENTAL FILING FEE CASH RECEIPT

RECEIPT# 415519

STATE CLEARING HOUSE # *(If applicable)*

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY

LEAD AGENCY: San Bernardino Valley Municipal Water District | DATE: 10/7/2011

COUNTY/STATE AGENCY OF FILING: County of San Bernardino | DOCUMENT NUMBER:

PROJECT TITLE: Water Banking and Water Supply Reliability Program with Kern Delta

PROJECT APPLICANT NAME: San Bernardino Valley Municipal Water District | PHONE NUMBER: (909) 387-9200

PROJECT APPLICANT ADDRESS: 380 East Vanderbilt Way | CITY: San Bernardino | STATE: CA | ZIP CODE: 92408

PROJECT APPLICANT *(Check appropriate box):*

☒ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	$2,839.25	$
☐ Mitigated/Negative Declaration (ND)(MND)	$2,044.00	$
☐ Application Fee Water Diversion *(State Water Resources Control Board Only)*	$850.00	$
☐ Projects Subject to Certified Regulatory Programs (CRP)	$965.50	$
☑ County Administrative Fee	$50.00	$ 50.00
☐ Project that is exempt from fees		
☑ Notice of Exemption		
☐ DFG No Effect Determination (Form Attached)		
☐ Other		$

PAYMENT METHOD: #394150

☐ Cash ☐ Credit ☑ Check ☐ Other TOTAL RECEIVED $ 50.00

SIGNATURE: X [signature] | TITLE: Deputy Clerk

WHITE - PROJECT APPLICANT YELLOW - DFG/ASB PINK - LEAD AGENCY GOLDENROD - COUNTY CLERK FG 753.5a (Rev. 11/10)

State of California—The Resources Agency
DEPARTMENT OF FISH AND GAME

2011 ENVIRONMENTAL FILING FEE CASH RECEIPT

RECEIPT# 415519

STATE CLEARING HOUSE # *(If applicable)*

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY

LEAD AGENCY: San Bernardino Valley Municipal Water District | DATE: 10/7/2011

COUNTY/STATE AGENCY OF FILING: County of San Bernardino | DOCUMENT NUMBER:

PROJECT TITLE: Water Banking and Water Supply Reliability Program with Kern Delta

PROJECT APPLICANT NAME: San Bernardino Valley Municipal Water District | PHONE NUMBER: (909) 387-9200

PROJECT APPLICANT ADDRESS: 380 East Vanderbilt Way | CITY: San Bernardino | STATE: CA | ZIP CODE: 92408

PROJECT APPLICANT *(Check appropriate box):*

☒ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	$2,839.25	$
☐ Mitigated/Negative Declaration (ND)(MND)	$2,044.00	$
☐ Application Fee Water Diversion *(State Water Resources Control Board Only)*	$850.00	$
☐ Projects Subject to Certified Regulatory Programs (CRP)	$965.50	$
☑ County Administrative Fee	$50.00	$ 50.00
☐ Project that is exempt from fees		
☑ Notice of Exemption		
☐ DFG No Effect Determination (Form Attached)		
☐ Other		$

PAYMENT METHOD: #394150

☐ Cash ☐ Credit ☑ Check ☐ Other TOTAL RECEIVED $ 50.00

SIGNATURE: X [signature] | TITLE: Deputy Clerk

WHITE - PROJECT APPLICANT YELLOW - DFG/ASB PINK - LEAD AGENCY GOLDENROD - COUNTY CLERK FG 753.5a (Rev. 11/10)

AGREEMENT BETWEEN KERN DELTA WATER DISTRICT AND THE SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT FOR A WATER MANAGEMENT PROGRAM

THIS AGREEMENT ("**Agreement**"), dated as of Oct 26, 2011, is entered into by and between the **KERN DELTA WATER DISTRICT** ("**Kern Delta**"), and **THE SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT** ("**Valley**"). Valley and Kern Delta may be referred to individually as Party or collectively as Parties.

PREAMBLE

This Agreement is in furtherance of development of a water management program ("Regulation Program") that is being implemented by Kern Delta and Valley for the purpose of enhancing the water supply available to both entities. It is intended that nothing in this Agreement or the Regulation Program is to (1) materially impair the integrity of existing and ongoing Kern Delta operations; (2) adversely impact either physically, operationally or economically the Kern Delta or its landowners; or (3) result in a net decrease in water supplies available for beneficial use within Kern Delta's boundaries specifically and the southern San Joaquin Valley generally. It is the intention of the Parties that, through provisions of this Agreement, actual or prospective adverse impacts of the Regulation Program will be avoided. The Regulation Program is intended to be operated in a manner to optimize available water supplies. It will utilize Kern Delta Facilities, as well as the Cross Valley Canal and the Intertie

Canal of the Arvin-Edison Transportation Facilities.

RECITALS

A. Kern Delta includes approximately 129,000 acres within its boundaries. Attached Exhibit B includes maps setting forth the boundaries (service area) of Kern Delta (Exhibit B-1); the Regulation Program Facilities (Exhibits B-2 and B-3). Approximately 87,000 acres have existing service connections to the Kern Delta distribution system (2,000 acres of which lie outside Kern Delta's boundaries), and the landowners within said surface water service area are in large part dependent on Kern Delta for a water supply. Additionally, Kern Delta's operations enhance groundwater conditions for the remaining approximately 34,000 acres within the District. To meet landowner demand, Kern Delta has, among other things, (i) contracted for a water supply with the Kern County Water Agency ("KCWA") providing for delivery to Kern Delta of 25,500 acre-feet of Table A Water from the California State Water Project ("Table A Water"); (2) entered into agreements with Buena Vista Water Storage District ("Buena Vista") providing for the exchange of Kern Delta's Table A Water for a like amount of Buena Vista's Kern River water; (3) acquired various Kern River water rights historically utilized to serve lands within and without Kern Delta's boundaries ("Kern River Entitlement"); and (4) entered into agreements with The Metropolitan Water District of Southern California ("Metropolitan") providing for the regulation of Metropolitan's water in the groundwater basin underlying Kern Delta. At times, Kern Delta has water available from its Table A Water, its Kern River Entitlement, or other sources, which could be better regulated through additional facilities constructed within Kern Delta and, in consideration of the benefits to be derived through this Agreement, Kern Delta is willing to regulate for Valley other water provided by Valley.

B. Valley is a public agency formed under the Municipal Water District Act of 1911. Valley provides imported supplies for water agencies to supplement local municipal water supplies within service area located in San Bernardino and Riverside Counties. Valley obtains its water supplies from the State Water Project, and other sources. Valley seeks to augment its dry year water supplies by arranging for delivery to and banking of water within Kern Delta and the extraction and delivery of banked water to Valley during periods of insufficient supply from available sources.

C. Valley and Kern Delta find that it will be mutually advantageous to enter into the Regulation Program as provided in this Agreement, whereby Kern Delta will regulate water on Valley's behalf and deliver that water to Valley upon request. The regulated water generally will be banked in the Kern Delta Basin and, upon demand of Valley; such water will be delivered to Valley through either an existing intertie into the California Aqueduct or through an exchange for water in the California Aqueduct, or both.

D. The Regulation Program will provide for usage by Valley of existing Kern Delta Facilities and construction and operation, for Valley usage, of Kern Delta Regulation Program Facilities, as well as Valley's usage of certain of Arvin-Edison Transportation Facilities and Cross Valley Canal. This Regulation Program is intended to provide a minimum recharge and return capability of 5,000 acre-feet annually.

E. This Agreement, through regulation and conservation of water supplies, is intended to (1) provide Valley with additional supplies of water and (ii) consistent with providing benefit to Valley also provide Kern Delta with access to new facilities, improved reliability of supplies and improve Kern Delta's ability to enhance groundwater conditions.

F. Consistent with the California Environmental Quality Act ("CEQA"), Kern Delta,

acting as lead agency, has completed an Environmental Impact Report concerning the Regulation Program. Kern Delta's Board of Directors, on November 12, 2002, considered, approved and certified the Final Environmental Impact Report ("FEIR"), as being in compliance with CEQA, and Valley's Board of Directors, acting as a responsible agency, on October 4, 2011,considered and approved a Notice of Exemption for the activities contemplated under this Agreement. A Notice of Determination to proceed with the Regulation Program was adopted by Kern Delta on November 12, 2002. In August 2011 Kern Delta prepared an addendum to the aforementioned EIR; this action is consistent with Kern Delta's 2002 Environmental Impact Report, which addresses the use of Kern Delta's existing and new recharge and conveyance facilities to enhance Kern Delta surface and groundwater supplies, (Exhibit E, Addendum to the FEIR).

G. The parties have relied upon various studies to make the following assumption upon which this Agreement is based: that, with existing facilities and wells along with the new facilities contemplated under this Agreement for the operation of the Regulation Program, it will be possible to regulate sufficient water in, and return sufficient water from, the groundwater basin for both Kern Delta's Normal and Customary Uses and Regulation Program purposes.

ARTICLE 1. DEFINITIONS

As used in this Agreement, each of the following terms shall have the respective meaning given to it in this Article 1 unless expressly stated to the contrary where such term is used.

1.1 "Account" means an account maintained by Kern Delta for the benefit of Valley pursuant to this Agreement in which Regulated Water, which is Delivered Water less losses deducted in accordance with Article 3 (Operational Losses), is credited upon delivery to the Point of Delivery to Kern Delta and is debited upon delivery to the Point of Delivery to Valley.

1.2 **"Account Balance"** means the difference between the credits and debits in the Account.

1.3 **"Agreement"** means, as of any particular time, this Agreement for a Water Management Program, as amended or supplemented by the Parties through that time.

1.4 **"Arvin-Edison Intake Canal"** means the Arvin-Edison Intake Canal owned and operated by the Arvin-Edison Water Storage District to the full extent of the capacity rights provided for in the Arvin-Edison MOU.

1.5 **"Arvin-Edison MOU"** means the agreement among Kern Delta with Arvin-Edison Water Storage District to use all or a portion of Arvin-Edison Transportation Facilities.

1.6 **"Arvin-Edison Transportation Facilities"** means Arvin-Edison Intake Canal, Forest Frick Pumping Plant, and all appurtenant facilities and structures as specified in the Arvin-Edison MOU.

1.7 **"Cross Valley Canal"** means the Cross Valley Canal owned and operated by the Kern County Water Agency to the full extent of Kern Delta's designated capacity (i.e., not including unused capacity of other participants) in the enlarged Cross Valley Canal as provided in the Cross Valley Canal Participation Agreement.

1.8 **"Cross Valley Canal Participation Agreement"** has the meaning provided for in this agreement, Recitals Section D.

1.9 **"Delivered Water"** means water which Valley makes available to Kern Delta at the Point of Delivery to Kern Delta pursuant to this Agreement.

1.10 **"Delivery Canal"** means (i) the Cross Valley Canal; and (ii) all interconnecting facilities from the Cross Valley Canal used to transport water to Kern Delta's service areas.

1.11 **"DWR"** means the Department of Water Resources of the State of California.

1.12 **"Effective Date"** means the date set forth on the first line of this Agreement

1.13 **"Execution Date"** means the date set forth on the first line of this Agreement.

1.14 **"Financial Account"** means the Account provided for in Section 5.1 (Put Payments).

1.15 **"KCWA"** means the Kern County Water Agency.

1.16 **"Kern Delta Basin"** means that portion of the southern San Joaquin Valley groundwater basin underlying the lands within the boundaries of Kern Delta.

1.17 **"Kern Delta Facilities"** means Kern Delta Regulation Program Facilities.

1.18 **"Kern Delta Regulation Program Facilities"** means Kern Delta Regulation Program Facilities.

1.19 **"Normal and Customary Uses"** means (i) deliveries to meet historic demands, as existing prior to Execution Date, of water users within Kern Delta's surface water service areas as provided at Subsection 4.2.2 of Section 4.2 (Conditions On Return of Regulated Water), (ii) historic transfers (including exchanges) and transfers similar to the type historically existing prior to Execution Date, entered into by Kern Delta with other entities, and (iii) operational conditions and criteria which would exist and/or be employed with or without the Regulation Program (for example spreading programs, energy load management, aquatic pest control and the like).

1.20 **"Participation Payment"** means the amount of money paid by Valley to Kern Delta for Delivered Water as full compensation for regulation program implementation costs (i.e., design, construction, inspection, administration and right of way) which amount is $40.00 per acre foot.

1.21 "Point of Delivery to Kern Delta" means the California Aqueduct turnout to the Cross Valley Canal; or other turnout mutually agreed upon by the parties such as the Arvin-Edison Transportation Facilities.

1.22 "Point of Delivery to Valley" means the California Aqueduct at/or between Reaches 12E and 14A, or any other point of delivery mutually agreed upon by the parties.

1.23 "Put Payment" means the Participation Payment and operation, maintenance and replacement costs determined on a per acre-foot basis, and energy cost in accordance with Section 5.1 (Put Payments) hereof.

1.24 "Regulated Water" means Delivered Water less losses deducted in accordance with Article 3 (Operational Losses), credited pursuant to Section 2.5 (Regulation of Water).

1.25 "Regulation Program" means the water management program provided for in this Agreement.

1.26 "Take Payment" means the amount of money paid by Valley to Kern Delta for each acre foot of Regulated Water returned to Valley pursuant to this Agreement, which amount is specified in Section 5.2 (Take Payments) hereof.

1.27 "Year" means a calendar year commencing on January 1 and ending on December 31.

ARTICLE 2. REGULATION OF WATER

2.1 Source of Water. Valley shall provide Delivered Water at the Point of Delivery to Kern Delta for regulation under this Agreement. All such Delivered Water (exclusive of losses) shall be credited to Valley's Account as Regulated Water. Delivered Water shall be of at least as good water quality as otherwise available from the California Aqueduct or as Kern Delta

would otherwise be able to accept for its own use.

2.2 Program Level. If requested by Valley, Kern Delta shall accept from Valley at the Point of Delivery to Kern Delta such a quantity of Delivered Water as will result in crediting to the Account 26,700 acre-feet (after losses determined pursuant to Article 3) of Regulated Water.

2.3 Priorities and Schedule For Regulation.

2.3.1 Kern Delta shall have first priority to utilize Kern Delta Facilities for the purpose of meeting Normal and Customary Uses. Regulation for Valley shall be second priority to the first priority.

2.3.2 Regulation program operations shall not cause a net decrease in supplies available to Kern Delta for its own purposes.

2.4 Scheduling of Delivered Water. Valley shall submit a schedule to Kern Delta for delivery of Delivered Water. Kern Delta, in conformity with Valley's schedule, shall be responsible for scheduling delivery of Delivered Water with KCWA and shall coordinate with KCWA on its resulting request to DWR for scheduling of Delivered Water. Valley shall provide written notice to Kern Delta of its intent to provide water for regulation pursuant to Section 2.6 (Deliveries).

2.5 Regulation of Water.

2.5.1 Kern Delta shall take control and possession of Delivered Water at the Point of Delivery to Kern Delta and shall credit the Account in an amount equal to the water so delivered less the deduction for losses provided for in Article 3 (Operational Losses) with respect to such water.

2.5.2 At the time Kern Delta credits the Account, pursuant to Subsection 2.5.1

of this Section 2.5 (Regulation of Water), legal title to such water, together with the right to withdraw from the Kern Delta Basin an amount sufficient to return to Valley the Regulated Water, shall vest in Kern Delta. Upon crediting Valley's Account, Kern Delta shall convey and cause to be regulated the water so credited. Kern Delta shall thereafter hold and return the Regulated Water as provided in Article 4 (Return of Water) of this Agreement.

2.5.3 Kern Delta shall accurately maintain the Account and prepare and maintain adequate supporting records. All records shall be subject to audit, review and approval by Valley at Valley's exercise upon reasonable notification to Kern Delta.

2.5.4 Valley acknowledges that Regulated Water may be commingled with other water. At all times during the term of this Agreement, there shall be in the Kern Delta Basin an amount at least equal to the amount of the Account Balance, which shall be deemed to be Regulated Water. Kern Delta shall be deemed to remove Regulated Water from storage only as and when requested by Valley pursuant to the terms of this Agreement, and any other removal of water by Kern Delta from the Kern Delta Basin shall be deemed to be the removal of water that is not Regulated Water.

2.6 Deliveries. Valley shall not be obligated to provide Delivered Water; but shall nevertheless use reasonable efforts to provide quantities of Delivered Water which, after losses pursuant to Article 3 (Operational Losses), shall result in Kern Delta crediting the minimum amounts of Regulated Water specified in Section 5.1 (Put Payments).

ARTICLE 3. OPERATIONAL LOSSES

Transportation losses, evaporation, metering discrepancies and any other losses of water, for purposes of this Agreement are collectively fixed to be eleven percent (11%) of the amount

of Delivered Water provided for the Regulation Program as measured at the Point of Delivery to Kern Delta. These losses are subject to modification in the future with the concurrence of both Parties. Any modifications shall only apply to deliveries made after the date of the modification and Account Balance shall not be adjusted as to previous Delivered Water and Regulated Water.

ARTICLE 4. RETURN OF WATER

4.1 Methods of Return of Regulated Water.

4.1.1 Kern Delta shall only be obligated to return Regulated Water so long as the return does not cause the Account Balance to be less than zero.

4.1.2 Upon request by Valley, Kern Delta shall deliver Regulated Water to Valley at the Point of Delivery to Valley by any one or more of the following methods: (i) an exchange of Regulated Water for SWP water in the California Aqueduct; (ii) an exchange of Regulated Water for other surface supplies, or with Valley's consent, groundwater deliverable to and into the California Aqueduct; (iii) the recovery of Regulated Water and delivery thereof to and into the California Aqueduct via existing or new Kern Delta facilities; or (iv) any other means mutually acceptable to the Parties.

4.1.3 In utilizing the methods specified in Subsection 4.1.2(ii) and (iv) of Section 4.1 (Methods of Return of Regulated Water), Kern Delta may propose to exchange Valley's Regulated Water for an equal amount of water from other sources which Kern Delta elects to make available in the California Aqueduct. Kern Delta will be deemed to have affected such an exchange by delivering such water to Valley at the Point of Delivery to Valley.

4.1.4 Kern Delta, upon request of Valley, and subject to the conditions at Sections 4.2 (Conditions On Return of Regulated Water) through 4.4 (Water Quality), shall

return up to 5,000 acre-feet of Regulated Water per year, subject to Section 4.2.3.

4.2 Conditions on Return of Regulated Water. The return of Regulated Water by Kern Delta to Valley shall be subject to the following terms and conditions:

4.2.1 Except as otherwise provided for in Section 8.1 (Regulation Program), for each acre-foot of Regulated Water held by Kern Delta for Valley, Kern Delta shall ultimately return one acre-foot of water to Valley.

4.2.2 Return of Regulated Water by Kern Delta shall not interfere with Normal and Customary Uses by Kern Delta of its available water supplies. Kern Delta may modify from time to time its service area. Any such modifications shall not interfere with Kern Delta's ability to deliver Regulated Water to Valley unless consented to in writing by Valley.

4.2.3 Notwithstanding any other provision of this Agreement, Kern Delta may temporarily reduce or terminate groundwater pumping for the purpose of returning Regulated Water to Valley to (i) ensure that the groundwater basin underlying Kern Delta is protected (to the maximum extent practicable), (ii) ensure that Valley's Account Balance does not become negative, (iii) ensure that the project facilities are physically capable of returning banked water either through exchange or directly, to the California Aqueduct, and (iv) protect Kern Delta's groundwater basin in regards to an extended drought. However, such reduction or termination shall only be temporary and Kern Delta shall, with Valley's approval, adjust the scheduling of groundwater pumping to mitigate reductions in return of Regulated Water and to the extent practical, in a manner that does not cause additional unreimbursed costs to Kern Delta, Kern Delta shall take measures to change the timing and location of pumping to avoid reduction in or termination of the return of Regulated Water or return other available supplies.

4.2.4 The Regulation Program shall not adversely affect Kern Delta's existing

exchanges with other parties.

4.3 Annual Scheduling of Regulated Water. Valley shall notify Kern Delta of its intent to take delivery of Regulated Water at a Point of Delivery to Valley as early in the Year as possible, but no later than March 15 of the same Year. If such notification is provided after March 15 Kern Delta shall, in good faith, endeavor to comply with the notice to the maximum extent feasible. Kern Delta shall be responsible for all necessary approvals to return the Regulated Water to the Point of Delivery to Valley. Valley shall be responsible for any necessary approvals and costs once the Regulated Water has been returned to the Point of Delivery to Valley, provided that Kern Delta shall cooperate in obtaining such approvals.

4.4 Water Quality.

4.4.1 Based on available data, the parties have concluded that Kern Delta currently can supply Regulated Water at the California Aqueduct which meets existing Safe Drinking Water Act primary and secondary standards. (The foregoing is only a reference to an existing standard and shall not be interpreted as causing Kern Delta to become subject to the Safe Drinking Water Act.) Subject only to Kern Delta obligations under contracts or agreements existing as of Execution Date, Kern Delta shall take no direct action that would knowingly cause the quality of recovered groundwater returned as Regulated Water to not meet the existing or reasonably predictable future Safe Drinking Water primary and secondary standards. Should Kern Delta knowingly take such impermissible direct action which causes the quality of Regulated Water delivered into the California Aqueduct to not meet existing or reasonably predictable future Safe Drinking Water Act primary and secondary standards, Kern Delta shall be responsible for taking additional steps, at Kern Delta's expense, to ensure that such water meets such standards. The preceding sentence shall not apply to delivery of water under Kern

Delta's Normal and Customary Uses or water quality degraded as a result of operating under this Program. In the event that future water quality standards change, or the quality of groundwater from Kern Delta wells or surface water is such that Kern Delta cannot meet acceptable standards for direct pumpback of Regulated Water into the California Aqueduct, Regulated Water shall be returned to Valley by alternative methods satisfactory to Valley. Such alternative methods may include, but are not necessarily limited to: purchases, exchanges with others, and/or by improving Regulated Water quality to acceptable standards for direct pumpback, with the additional costs of any such methods being paid by Valley. Kern Delta's operations and financial situation shall not be adversely impacted as a result of these alternative methods.

4.4.2 Without limiting the foregoing, Kern Delta shall rotate pumping if and to the extent necessary to maximize Regulated Water quality and to use the best quality wells available, to the greatest extent practicable, for Regulated Water return purposes.

ARTICLE 5. COMPENSATION

5.1 Put Payments. Valley shall pay Kern Delta for each acre foot of Delivered Water a Put Payment which shall consist of; (i) a Participation Payment, plus (ii) an amount equal to actual costs per acre foot of operation, maintenance and replacement of Kern Delta Facilities used to regulate Delivered Water determined in accordance with Section 5.5 (OM&R Fees); plus (iii) an amount sufficient to pay all energy costs associated with the delivery, distribution, and recharge of each acre foot of Delivered Water determined in accordance with Section 5.4 (Power & Energy Costs).

5.2 Take Payments. For each acre foot of Regulated Water returned by Kern Delta to Valley, whether by recovery from the Kern Delta Basin or by exchange, Valley shall pay to

Kern Delta a Take Payment equal to the sum of the following components: (i) $47.00 adjusted pursuant to Subsection 5.3 (Adjustment of Rates) from the Effective Date; plus (ii) an amount equal to actual costs per acre foot of operation, maintenance, repair and replacement of Kern Delta Facilities used to provide Regulated Water to Valley calculated as set forth in Section 5.5 (OM&R Fees) below; plus (iii) an amount sufficient to pay all energy costs associated with the delivery of each acre foot of Regulated Water to Valley calculated as set forth in Section 5.4 (Power & Energy Costs) below.

5.3 Adjustment of Rates. The amount payable for a calendar year under Section 5.1 and Section 5.2 shall be adjusted commencing December 1 of each year commencing 2011 for the following year by the fraction of the numerator of which is the Consumer Price Index, All Urban Consumers, All Items Index, Western Cities with populations of 50,000 to 330,000 (the "CPI") for December of the Year immediately preceding the Year with respect to which the adjusted amount is being determined and the denominator of which shall be the CPI for 2010 (based on the 1982-84 index).

5.4 Power & Energy Costs.

5.4.1 The Put Payment component as specified in Section 5.1 to convey Delivered Water from Kern Delta's Point of Delivery to Spreading Facilities or in lieu delivery points shall be an amount sufficient to pay all energy costs associated with the delivery, distribution, and recharge of each acre foot of Delivered Water. Take Payment component specified in Subsection 5.2 shall be determined by calculating the average unit power and energy costs to pump Regulated Water from the Kern Delta Basin for either direct delivery to the California Aqueduct or for entitlement exchange, and to convey Regulated Water through the distribution system and to deliver such water into the California Aqueduct. Said power costs

shall be computed based on the amount of energy consumed to pump, withdraw, transport, and when applicable to convey to the California Aqueduct Valley's Regulated Water in a given Year multiplied by Kern Delta's average actual unit power cost for that period.

5.4.2 The initial calculation of energy costs shall be consistent with the calculation shown in the table included in Exhibit "B-1," (Methodology for Determining Energy Requirements) and incorporated herein by this reference. The Table 2 (Energy Analysis Results) in Exhibit B-1 may be revised from time to time by written consent of the Parties, which consent shall not be unreasonably withheld. The intent of Exhibit B-1 is to provide Kern Delta with sufficient revenue to recover the power costs incurred by Kern Delta for transportation, regulation and withdrawal of Delivered and Regulated Water and to allow Kern Delta flexibility to change the calculation based on experience and the changing electric utility industry and possible changes in its power supply and transmission contracts.

5.5 OM&R Fees. For each acre-foot of Delivered Water or Regulated Water, whether conveyed directly by Kern Delta or by exchange, Valley shall pay to Kern Delta the applicable operation, maintenance and replacement fee ("OM&R fee") based on the following rates which are to approximate Kern Delta's actual OM&R and administrative costs to perform the functions listed. The methodology for determining such costs is included in Exhibit "B-2" (Methodology for Determining O&M Costs and Replacement Cost) attached hereto and incorporated herein by this reference.

5.5.1 Spreading (Either direct recharge or in-lieu or exchange) OM&R Fee of $3.52 per acre-foot of Delivered Water regulated for Valley.

5.5.2 Extraction (Either direct pumping or in-lieu or exchange) OM&R Fee of $8.20 per acre-foot of Regulated Water delivered to Valley upon return of Regulated Water.

5.5.3 Conveyance (Either directly conveyed or exchange) OM&R Fee of $19.88 per acre-foot of Delivered Water (upon delivery into storage), and $12.88 per acre-foot of Regulated Water (upon return of Regulated Water).

5.5.4 Commencing December of the first full year following Execution Date, each OM&R Fee provided for in this Section 5.5 (OM&R Fees) shall be adjusted for the following year by the fraction of the numerator of which is the Consumer Price Index, All Urban Consumers, All Items Index, Western Cities with populations of 50,000 to 330,000 (the "CPI") for December of the Year immediately preceding the Year with respect to which the adjusted amount is being determined and the denominator of which shall be the CPI for 2010 (based on the 1982-84 index). In lieu of the aforesaid adjustment for each of the sixth and subsequent fifth full years ("Methodology Adjustment Years") following Execution Date, each OM&R Fee provided for in this Section 5.5 (OM&R Fees) shall be subject to the Methodology Adjustment, which shall utilize the applicable methodology provided for in Exhibit B-2 (Methodology for Determining O&M Costs and Replacement Costs). For purposes of calculating adjustments in years between Methodology Adjustment Years, the OM&R Fee determined for the previous Methodology Adjustment Year shall be utilized for adjustments until the next succeeding Methodology Adjustment Year.

5.6 State Project Costs. For all Regulated Water returned by Kern Delta pursuant to Subsection 4.1.2 of Section 4.1 (Methods of Return of Regulated Water), Valley shall pay applicable State Water Project costs beyond the Point of Delivery to Valley.

5.7 Payment Schedule. For payment obligations incurred pursuant to Participation Payments; Sections 5.1 (Put Payments); 5.2 (Take Payments); 5.4 (Power & Energy Costs); and 5.5 (OM&R Fees), Kern Delta may only bill Valley for water previously credited or debited to

Account pursuant to this Agreement. In all events, Kern Delta may only bill Valley, no more frequently than monthly for payments under this Agreement which payments shall be due Kern Delta and shall become delinquent thirty (30) days after Valley receives the invoice under the terms of this Agreement. Data supporting the amounts invoiced shall be provided upon the request of Valley. Kern Delta shall correct any erroneous billing promptly upon discovery of the error. If Valley has been underbilled, payment of the underbilled amount, together with interest thereon at the average investment yield of Valley's investments as reported monthly by Valley's Treasurer, shall be due and become delinquent thirty (30) days after Valley receives the corrective invoice and data justifying the change. Correction of overpayments by Valley shall become delinquent unless refunded by Kern Delta to Valley within forty-five days of discovery by either Valley or Kern Delta, together with interest thereon computed from the date the overpayment was made at the average investment yield of Valley's investments as reported monthly by Valley's Treasurer.

5.8 Delinquencies. In addition to other amounts payable, delinquencies shall bear interest at the rate of one percent (1%) per month.

ARTICLE 6. DIVISION OF RISK RESPONSIBILITIES

Kern Delta and Valley agree to cooperate, in reducing, to the greatest extent practicable, the risk from claims arising against any of the Parties from implementation of this Agreement. In the event of claims by third parties relating to this Agreement, the responsibilities of Kern Delta, and Valley shall be divided as follows:

6.1 Kern Delta Responsibilities. Kern Delta shall defend, indemnify and hold harmless Valley and its directors, officers, agents, employees and volunteers against any and all

losses, claims, demands and causes of action (herein collectively referred to as "claims") and shall assume responsibility for payment of any settlements, judgments, costs and attorneys' fees arising from claims concerning the following:

(a) Control, carriage, transportation, handling, use, disposal, or distribution of Delivered, Regulated or Transported Water from the Point of Delivery to Kern Delta and to the Point of Delivery to Valley;

(b) Any contest or dispute by any landowner or water user within the service area of, or otherwise served by, Kern Delta concerning the allocation of benefits among or the assessment of charges to Kern Delta landowners or water users;

(c) Construction, repair, modification, or replacement of any Regulation Program Facilities;

(d) Operation of the Regulation Program or Kern Delta Facilities or the actions of Kern Delta's officers, employees or agents; and

(e) Any other activities under the exclusive control of Kern Delta. If Valley is named in any such action, it may submit its defense to Kern Delta, which shall bear the full cost of defense, except to the extent that Valley utilizes its own counsel for such defense. Notwithstanding the foregoing, the responsibility for any claims challenging the validity, underlying authority or enforceability of the Regulation Program under this Agreement shall be as provided at Section 6.3 (Other Claims). Valley shall not be entitled to any indemnification from Kern Delta except as set forth in this Section 6.1 (Kern Delta Responsibilities).

6.2 Valley Responsibilities. Valley shall defend, indemnify and hold harmless Kern Delta and its respective directors, officers, agents, employees and volunteers, against any and all claims and shall assume responsibility for payment of any settlements, judgments, costs or

attorneys' fees arising from claims concerning the following:

(a) Control, transportation, handling, use, disposal or distribution of Delivered Water to the Point of Delivery to Kern Delta and Regulated Water from the Point of Delivery to Valley;

(b) Any claim by a landowner, resident, public agency or other entity within the service area of, or otherwise served by, Valley challenging the Regulation Program or this Agreement directly or indirectly;

(c) Construction, repair, modification or replacement of any of the facilities of Valley, or the State Water Project;

(d) Operation of the facilities of or the actions of the officers, employees or agents of Valley; and

(e) Any other activities under the exclusive control of Valley.

If Kern Delta is named in any such action, it may submit its defense to Valley involved, in which event Valley shall bear the full cost of defense, except to the extent Kern Delta utilizes its own counsel for such defense. Notwithstanding the foregoing, the responsibility for any claims challenging the validity, underlying authority or enforceability of the Program under this Agreement shall be as provided at Section 6.3 (Other Claims). Kern Delta shall not be entitled to any indemnification from Valley except as set forth in this Section 6.2 (Valley Responsibilities).

6.3 Other Claims. As for any claims by a third party with respect to the Regulation Program which are not otherwise provided for at Sections 6.1 (Kern Delta Responsibilities) or 6.2 (Valley Responsibilities), including any claims challenging the underlying authority for or the validity or enforceability of the Regulation Program under this Agreement, Valley shall be responsible for payment of any settlements it has approved or any judgments with respect to such claims. If Kern Delta is named in any action with respect to such a claim, it may submit its

defense to Valley and Valley shall bear the full cost of defense, except to the extent Kern Delta utilizes its own counsel for such defense. At the request of Valley, Kern Delta shall join in the defense of any claim which is not adverse to Kern Delta's water supply or financial interests, in which case Valley shall reimburse Kern Delta for all of its costs of defense. However, with respect to claims in which one or more of the plaintiffs resides or does business in Kern County challenging the recovery of groundwater under this Agreement, Valley may demand that Kern Delta join in the defense of claims. In such case, Kern Delta must comply with any such demand, the Parties shall jointly manage the litigation, and Kern Delta and Valley shall each pay one-half of the defense costs. In other such cases, Valley shall reimburse Kern Delta for all of its costs of defense.

6.4 Multiple Claims. In the event that payments are made in settlement of a claim, in satisfaction of a judgment or for defense costs where the claim arises from issues applying to both Kern Delta and Valley, payments shall be divided in proportion to the relative liability of each arising from the common claim. If the Parties cannot agree on the proportion, then the share to be paid by each of Kern Delta and Valley shall be submitted to arbitration as provided at Article 7 hereof.

ARTICLE 7. DISPUTE RESOLUTION

7.1 Informal Mediation. In the event of a dispute regarding the interpretation or implementation of this Agreement, or if the parties are unable to agree upon a matter as to which their agreement is provided for hereunder, the Parties will endeavor to resolve the dispute by using the services of a mutually acceptable consultant. The fees and expenses of the consultant shall be shared equally by the Parties.

7.2 Arbitration.

7.2.1 If a consultant cannot be agreed upon, or if the consultant's recommendations are not acceptable to the Parties, and unless the Parties otherwise agree, the matter shall be resolved by arbitration as provided in this Article 7 and in the California Arbitration Act (Part 3 [commencing with § 1280], Tit. 9, Calif. Code Civ. Proc.), including Section 1283.05. The Parties agree to be bound by the majority decision of a three-member panel to be selected as follows: (i) one member shall be selected by Valley; (ii) one member shall be selected by Kern Delta; and (iii) the third member shall be selected by the other two (2) members. If the two (2) members selected by Valley and Kern Delta are unable to agree on the selection of a third member, either Party may petition a court to appoint the third member pursuant to Code of Civil Procedure Section 1281.6. Each Party shall be responsible for any fees and expenses of the member of the panel appointed by that Party, and the fees and expenses of the third member of the panel shall be shared fifty percent (50%) by Kern Delta and fifty percent (50%) by Valley.

7.2.2 If a Party asserts that another Party has breached obligations under this Agreement, it may request that the arbitration panel order the other Party to comply with this Agreement. Upon the panel finding that a Party has in fact breached this Agreement, the panel shall order compliance. The panel may order any other equitable relief permitted by California law, including declaratory or injunctive relief, applicable to the matter before the panel for resolution. If termination is sought by a party pursuant to the terms hereof, the panel may determine the issues of whether a default has occurred or other condition precedent to the termination alleged has been satisfied and, if so, may issue orders implementing that termination. The orders of the panel shall be judicially enforceable. The panel may order that the effective

date of its order be the date of the breach, if appropriate. If Valley has suspended payments as provided in Subsection 9.1.2 of Section 9.1 (Remedies in the Event of Kern Delta's Willful Failure to Perform), it shall reimburse Kern Delta for any monies withheld and then due to Kern Delta as soon as Kern Delta again fully complies with this Agreement unless otherwise ordered by the panel. The panel may not order any damages (including consequential or punitive damages) beyond those provided for or permitted under this Agreement.

ARTICLE 8 TERM OF AGREEMENT

8.1 Regulation Program. Unless the Regulation Program provisions of this Agreement are earlier terminated pursuant to Subsection 9.1.3 of Section 9.1 (Remedies in the Event of Kern Delta's Willful Failure to Perform), Section 9.2 (Remedies in the Event of Valley's Voluntary Failure to Perform), Section 9.3 (Remedies in Event of Failure of Certain Other Remedies), or Section 10.2 (Involuntary Termination), Valley's right to provide Delivered Water pursuant to Section 2.1 (Source of Water) and to receive Regulated Water pursuant to Article 4 (Return of Water) shall terminate at the end of 2035. At the end of 2035, the entire Account Balance shall be debited and the remaining Regulated Water, if any, shall be available for Kern Delta to utilize for its own purposes.

8.2 Agreement Termination. This Agreement shall terminate at the time of termination of both the Regulation Program unless extended pursuant to Section 8.3 (Pending and Late Arising Claims).

8.3 Pending and Late Arising Claims. If a claim arising under or with respect to one or more terms of this Agreement has not been resolved when such term terminates, or if such a claim is brought after this Agreement has terminated but within the period of time for bringing

such a claim under California law ("Late Arising Claim"), the provisions of this Agreement shall continue in full force and effect for such additional period of time as is necessary to resolve such claims and to satisfy the rights and obligations of the Parties hereto with respect thereto.

8.4 Renewals of Agreement. This Agreement may be renewed by mutual agreement of the Parties, which renewal shall, unless otherwise agreed, effect a continuation of both parties' rights and duties under this Agreement.

ARTICLE 9. REMEDIES

9.1 Remedies in the Event of Kern Delta's Willful Failure to Perform.

9.1.1 If Valley alleges that Kern Delta has not substantially performed according to the terms of this Agreement or has willfully failed to perform this Agreement by causing (or, if within Kern Delta's jurisdiction, permitting) other entities or persons to interfere with Regulation Program operation, or by failing to accept or return water as and when required by this Agreement, or if Kern Delta has otherwise breached its obligations under this Agreement and notice has been provided to Kern Delta pursuant to Section 11.4 (Waiver/Cure of Defaults) and Kern Delta has failed to cure the alleged breach within the time provided in Section 11.4 (Waiver/Cure of Defaults), Valley may, at any time thereafter while the default is continuing, advise Kern Delta of the remedy or remedies provided in Article 7 (Dispute Resolution), and Subsections 9.1.2 and 9.1.3 below which Valley intends to pursue with respect to such default. Kern Delta may challenge at any time, through Article 7 (Dispute Resolution), whether in fact there has been a breach of or default under this Agreement by Kern Delta.

9.1.2 In the event of an alleged breach as to which Valley has given notice to Kern Delta pursuant to Section 9.1.1, Valley may elect to suspend any payment obligations it

may have under Article 5 (Compensation) of this Agreement until Kern Delta complies with the terms of this Agreement and cures such breach or default, or is determined, pursuant to Article 7 (Dispute Resolution), not to have violated the Agreement. Notwithstanding such suspension of Valley's payment obligations, this Agreement shall remain in effect unless and until Valley elects to terminate the Agreement under Section 9.1.3 in which case termination shall occur in accordance with and as provided in such provision. Notwithstanding an election by Valley under this Section 9.1.2 to suspend payment obligations, Valley or Kern Delta may thereafter also seek relief under Article 7 (Dispute Resolution).

9.1.3 If Kern Delta willfully fails to recharge or return water for or to Valley under circumstances where such performance or nonperformance is not excused by the terms of this Agreement and Valley elects to terminate this Agreement, Kern Delta shall purchase the amount of Valley's Regulated Water in its Account Balance for an amount equal to Valley's previous payments with respect to such Regulated Water, all adjusted as provided in Section 5.5.2, all payable within one (1) year of said election by Valley to terminate. Once such payment has been fully made, this Agreement shall be fully terminated except for Preamble; Recitals; Articles 1 (Definitions); 7 (Dispute Resolution); 8 (Term of Agreement); 9 (Remedies); and 11 (Miscellaneous Provisions). Upon payment in full by Kern Delta as provided above, Valley's beneficial interest in the amount of Regulated Water in Valley's Account Balance shall vest in Kern Delta free of obligations and Kern Delta shall be entitled to produce and use such water for its own account.

9.2 Remedies in the Event of Valley's Voluntary Failure to Perform. If Valley has not substantially performed according to the terms of this Agreement, and notice has been provided to Valley pursuant to Section 11.4 (Waiver/Cure of Defaults) and Valley has failed to

cure the alleged breach within the time provided in Section 11.4 (Waiver/Cure of Defaults), Kern Delta may at its election, at any time thereafter while the default is continuing, either (i) suspend further performance and thereafter seek relief under Article 7 (Dispute Resolution), recommencing performance once Valley complies with the Agreement, or (ii) terminate this Agreement. If Kern Delta elects to terminate this Agreement, any Regulated Water remaining in Valley's Account shall be transferred to Kern Delta at no cost to Kern Delta. In such event, Kern Delta shall have no further responsibility for repayment of funds advanced by Valley under Article 5 (Compensation). Valley may challenge at any time, through Article 8 (Dispute Resolution), whether in fact there has been a breach of this Agreement by Valley.

9.3 Remedies in Event of Failure of Certain Other Remedies. If: (i) Kern Delta has breached or defaulted in the performance of its obligations under this Agreement, and (ii) Valley has given notice of the breach or default pursuant to Subsection 9.1.1 of Section 9.1 (Remedies in the Event of Kern Delta's Willful Failure to Perform), and (iii) Kern Delta has failed to cure that breach or default within thirty (30) days as required by Section 11.4 (Waiver/Cure of Defaults), and (iv) Valley has elected a remedy for that breach or default pursuant to Subsection 9.1.1 of Section 9.1 (Remedies in the Event of Kern Delta's Willful Failure to Perform), and (v) Kern Delta has agreed to such remedy or, if Kern Delta has not so agreed, Valley has obtained a judgment or court order against Kern Delta (whether based on an order of an arbitration panel under Article 7 (Dispute Resolution) or otherwise) which judgment or court order Kern Delta has failed or refused to perform, *then* Valley may notify Kern Delta that Valley is entitled to and intends to exercise its right to appointment of a successor in place of Kern Delta and, thereafter, Valley may apply to a court of competent jurisdiction for such appointment of a successor who shall be charged with performing the duties pursuant to the

terms of this Agreement. The successor, when appointed, shall be entitled to exercise any and all rights theretofore held by Kern Delta for Valley. Upon the later of (i) receipt by Valley at the California Aqueduct of water in an amount equal to Valley's Account Balance pursuant to the exercise by such successor of its rights, or (ii) expiration of the term specified in Section 8 (Term of Agreement), this Agreement shall be fully terminated unless extended pursuant to Section 8.4 (Pending and Late Arising Claims).

ARTICLE 10. EARLY TERMINATION

10.1 Resignation of Kern Delta. Kern Delta may not resign its duties and obligations under this Agreement for the term of this Agreement except as permitted by Sections 9.2 (Remedies in the Event of Valley's Voluntary Failure to Perform) and 10.2 (Involuntary Termination), and any other attempt by Kern Delta to resign shall be deemed to be a breach of its obligations hereunder.

10.2 Involuntary Termination. Notwithstanding Article 9 (Remedies), in the event that Kern Delta is unable to perform its obligations under this Agreement for reasons beyond its control, the following shall apply ("reasons beyond its control" as used in this sentence shall not include any reasons caused by Kern Delta's breach of its obligations under this Agreement or other failure to comply with any of its legal obligations).

10.2.1 If such inability to perform relates to the Regulation Program, and that inability to perform includes the inability of Kern Delta to return Regulated Water which remains in the Valley Account Balance, Kern Delta shall purchase the Regulated Water which Kern Delta is unable to return for an amount equal to the costs which Kern Delta would have incurred to purchase such water under its contract with the KCWA in the Year such Regulated Water was

delivered to storage. Such payment by Kern Delta to Valley upon involuntary termination under this Section 9.2 (Remedies in the Event of Valley's Voluntary Failure to Perform) shall be financed over time upon terms mutually agreeable to Valley and Kern Delta. If Valley and Kern Delta are unable to agree on such terms in a reasonable period of time, they shall resolve their disagreement pursuant to Article 7 (Dispute Resolution). Once such payments have been fully made, this Agreement shall be fully terminated. If payment is made as provided above, the beneficial interest in the amount of Valley's Regulated Water in Valley's Account Balance which Kern Delta is unable to return shall vest in Kern Delta.

ARTICLE 11. MISCELLANEOUS PROVISIONS

11.1 Successors and Assigns. This Agreement shall bind and inure to the benefit of the successors and assigns of the Parties; provided, however, neither Party shall assign any of their rights or obligations under this Agreement without the prior written consent of the other. Nothing in this Agreement is intended to confer any right or remedy under this Agreement on any person other than the parties to this Agreement and their respective successors and permitted assigns, or to relieve or discharge any obligation or liability of any person to any party to this Agreement, or to give any person any right of subrogation or action over or against any party to this Agreement.

11.2 No Precedent. Kern Delta entering into this Agreement shall not create in Valley any rights beyond those expressly provided by this Agreement, nor shall it establish any precedent for extension or renewal of this Agreement beyond its term. Furthermore, Valley shall not make any claim to continued use of water provided under this Agreement, beyond that expressly provided under this Agreement, including, but not limited to, asserting any right

against Kern Delta to use of water beyond the term of this Agreement under the doctrine of intervening public use.

11.3 No Modification of Existing Contracts. This Agreement shall not be interpreted to modify the terms or conditions of either the water supply contracts between DWR and Valley or the water supply and related agreements between Kern Delta and other parties.

11.4 Waiver/Cure of Defaults. The failure of any Party to enforce against the other a provision of this Agreement shall not constitute a waiver of that Party's right to enforce such a provision at a later time. No Party shall be deemed to be in default of any provision of this Agreement unless the other Party has given written notice specifically stating the alleged default and the Party in default fails to cure the default within thirty (30) days of receipt of such written notice.

11.5 Construction of Agreement. The language in all parts of this Agreement shall be in all cases construed simply according to its fair meaning and not strictly for or against any of the parties hereto and Section 1654 of the Civil Code has no application to interpretation of this Agreement. Headings at the beginning of Sections, paragraphs and subparagraphs of this Agreement are solely for the convenience of the Parties, are not a part of this Agreement and shall not be used in construing it. The preamble, recitals and all exhibits and schedules to this Agreement are part of this Agreement and are incorporated herein by this reference. When required by the context: whenever the singular number is used in this Agreement, the same shall include the plural, and the plural shall include the singular; and the masculine gender shall include the feminine and neuter genders and vice versa. Unless otherwise required by the context (or otherwise provided herein): the words "herein," "hereof" and "hereunder" and similar words shall refer to the Agreement generally and not merely to the provision in which such term

is used; the word "person" shall include individual, partnership, corporation, limited liability company, business trust, joint stock company, trust, unincorporated association, joint venture, governmental authority and other entity of whatever nature; each of the words "Valley" and "Kern Delta" shall include the respective representatives, successors and permitted assigns, if any, of such person; the words "including," "include" or "includes" shall be interpreted in a non-exclusive manner as though the words "but [is] not limited to" or "but without limiting the generality of the foregoing" immediately followed the same; the word "month" shall mean calendar month; and the term "business day" shall mean any day other than a Saturday, Sunday or legal holiday. If the day on which performance of any act or the occurrence of any event hereunder is due is not a business day, the time when such performance or occurrence shall be due shall be the first business day occurring after the day on which performance or occurrence would otherwise be due hereunder. All times provided in this Agreement for the performance of any act will be strictly construed, time being of the essence of this Agreement.

11.6 Entire Agreement. This Agreement and other documents expressly referenced herein constitute the entire agreement between the Parties pertaining to the matters provided for herein and, except as herein provided, supersedes all prior and/or contemporaneous agreements and understanding, whether written or oral, pertaining between the Parties relating to the matters provided for herein. In the event of inconsistency between and among (i) other documents, (ii) Exhibits to this Agreement, and (iii) the remaining provisions of this Agreement, the remaining provisions of this Agreement shall control.

11.7 Severability. In the event that a court of competent jurisdiction or an arbitration panel as provided at Article 7 (Dispute Resolution) determines that a provision included in this Agreement is legally invalid or unenforceable and such decision becomes final, the Parties to this

Agreement shall use their best efforts to (i) within thirty (30) days of the date of such final decision identify by mutual agreement the provisions of this Agreement which must be revised, and (ii) within three (3) months thereafter promptly agree on the appropriate revision(s). The time periods specified above may be extended by mutual agreement of the Parties. Pending the completion of the actions designated above, to the extent it is reasonably practical and can be done without violating any applicable provisions of law, the provisions of this Agreement which were not found to be legally invalid or unenforceable in the final decision shall continue in effect. If the Parties cannot agree on appropriate revisions, this Agreement shall be involuntarily terminated in accordance with Section 9.2 (Remedies in the Event of Valley's Voluntary Failure to Perform).

11.8 Force Majeure. All obligations of the Parties other than monetary or payment obligations shall be suspended for so long as and to the extent the performance thereof is prevented, directly or indirectly, not to exceed one year, by earthquakes, fires, tornadoes, facility failures, floods, strikes, other casualties, acts of God, orders of court or governmental agencies having competent jurisdiction, or other events or causes beyond the control of the Parties. In no event shall any liability accrue against a Party, to its officers, agents or employees, for any damage arising out of or connected with a suspension of performance pursuant to this Section 11.8. All time limits to perform and the term of the Agreement shall be extended by period equivalent to the length of suspension. In event of such an occurrence of duration in excess of one year, Section 10.2 (Involuntary Termination) shall control, unless the Parties otherwise agree.

11.9 Notices. All notices, requests and demands hereunder ("Notices") shall be in writing and shall be deemed to have been duly given when delivered (or, if mailed, postage

prepaid, on the third business day after mailing, if that date is earlier than actual delivery). Notices shall be sent to a Party at the address of that Party set forth below or, if such Party has furnished notice of a change of that address as herein provided, to the address of that Party most recently so furnished. Notices for Kern Delta shall be sent to the Engineer Manager of Kern Delta at 501 Taft Highway, Bakersfield, CA 93307-6247. Notices for Valley shall be sent to the General Manager of Valley at 380 East Vanderbilt Way, San Bernardino 92408. Each Party hereto (a "Recipient") who receives from another Party hereto (a "Sender") by electronic facsimile transmission (telecopier) any writing which appears to be signed by that Sender is authorized to rely and act upon that writing in the same manner as if the original signed writing was in the possession of the Recipient upon oral confirmation of that Sender to the Recipient that the writing was signed by that Sender and is intended by that Sender to be relied upon by the Recipient. Each Party transmitting any writing to any other Party by electronic facsimile transmission agrees to forward immediately to that Recipient, by expedited means (for next day delivery, if possible), or by first class mail if the Recipient so agrees, the signed hard copy of that writing, unless the Recipient expressly agrees to some other disposition of the original by the Sender.

11.10 Regulatory Changes. It is recognized that changes in Kern Delta's actual costs of operating the Regulation Program or changes in other conditions affecting the Regulation Program may occur on or after the date this Agreement is executed as a result of enactments, amendments, changes in implementation or interpretation, or repeal of any federal or state law, rule, regulation or ordinance or changes in contract terms (each, a "Regulatory Change"). If either Party determines that a Regulatory Change has occurred that would result in a material change (upward or downward) in Kern Delta's costs or other conditions relating to regulating,

recovering or transporting water pursuant to the terms of this Agreement, which change is not reflected in the adjustments in the payments due from Valley to Kern Delta pursuant to Article 5 (Compensation) or other provision of this Agreement, such Party shall promptly inform the other Party of the nature and extent of such alleged Regulatory Change and of the reason why that party believes an adjustment pursuant to this Section 11.10 is warranted in the payments due from Valley to Kern Delta or in other terms or conditions. The Parties will thereupon attempt to reach an appropriate amendment of this Agreement in light of the Regulatory Change. If such agreement cannot be reached within forty-five (45) days after either Party has provided the required notice and information, the matter shall be resolved pursuant to Article 7 (Dispute Resolution), the qualified third party or arbitration panel being charged with determining (i) whether a Regulatory Change has occurred (if that is in dispute), (ii) the amount of change, if any, in Kern Delta's costs resulting from the Regulatory Change, and (iii) the manner in which the payments due from Valley to Kern Delta or other terms or conditions which should be modified are to be adjusted to fairly and equitably reflect that change in Kern Delta's costs or other terms and conditions (it being the intent of the Parties that no windfall or unwarranted compensation or benefit should result to any Party as a result of any adjustment made pursuant to this Section 11.10). Any adjustment to the payments due from Valley to Kern Delta or other terms and conditions made pursuant to this Section 11.10 shall be effective as of the first day such Regulatory Change affects Kern Delta operations hereunder unless the Parties otherwise agree and may be reconsidered thereafter at any time, at the request of any Party, if the adjustment is unjustly under-compensating or over-compensating any Party.

11.11 Further Assurances. Each Party hereto, upon the request of the other, agrees to perform such further acts and to execute and deliver such other documents as are reasonably necessary to carry out the provisions of this instrument.

11.12 Counterparts. This Agreement, and any document or instrument entered into, given or made pursuant to this Agreement or authorized hereby, and any amendment or supplement thereto may be executed in two or more counterparts, and by each party on a separate counterpart, each of which, when executed and delivered, shall be an original and all of which together shall constitute one instrument, with the same force and effect as though all signatures appeared on a single document. Any signature page of this Agreement or of such an amendment, supplement, document or instrument may be detached from any counterpart without impairing the legal effect of any signatures thereon, and may be attached to another counterpart identical in form thereto but having attached to it one or more additional signature pages. In proving this Agreement or any such amendment, supplement, document or instrument, it shall not be necessary to produce or account for more than one counterpart thereof signed by the party against whom enforcement is sought.

Executed the day and year first hereinabove written.

THE SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

By:_____
President

APPROVED AS TO FORM:

By:_____

General Counsel

KERN DELTA WATER DISTRICT

By: _____
President

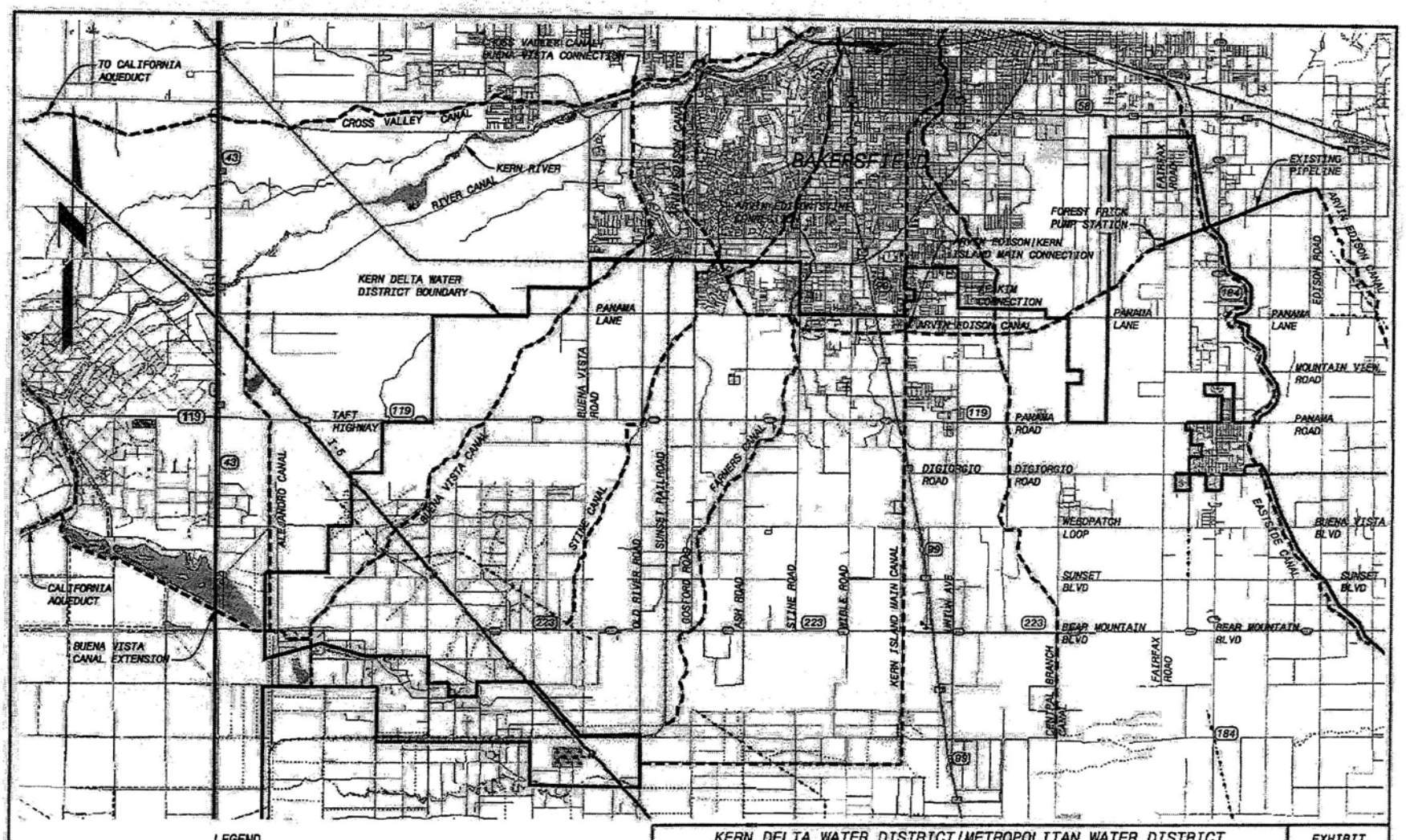
By: _____
Secretary

APPROVED AS TO FORM:

By: _____
General Counsel

Exhibits

A. Map Depicting Kern-Delta Boundaries and Program Facilities
B-1. Methodology for Determining Energy Requirements
B-2. Methodology for Determining O&M Costs and Replacement Cost
C. Certification That Conditions Precedent Have Been Satisfied or Waived
D. Map Depicting Kern Delta Boundaries and Program Facilities



N:\ACAD\Kern Delta\Exihibit F.dwg 11/23/2004 13:22:07

EXHIBIT B-1

BLACK & VEATCH Corporation

METHODOLOGY FOR DETERMINING ENERGY REQUIREMENTS

Kern Delta Water District Water Banking Program
Water Banking Program

B&V Project 99241
B&V File D.2
January 11, 2002

To: L. Mark Mulkay
Project Manager

From: Steven N. Foellmi, P.E.
Technical Manager

Prepared By: Klint Reedy, P.E.
Victor Tsai

EXECUTIVE SUMMARY

PURPOSE

The purpose of this memorandum is to evaluate the energy requirements associated with the facilities required for the Kern Delta Water District Water (KDWD) Banking Program (Kern Delta Project). The estimated energy requirements associated with these facilities are based on Black & Veatch experience and record data from the operation of similar facilities by other local agencies. In addition to estimating the power requirements, a preliminary assessment of the existing local electrical distribution facilities ability to meet potential future operating demands are investigated.

BACKGROUND

As part of the Water Banking Program, five new pump stations (Kern Delta pump stations No.1 through 5) would be built along the new Kern Delta Canal to allow for conveyance of water between the Kern Water Bank Authority (KWBA) Canal and the Arvin-Edison Canal. The pumping plants would take water from a lower canal segment and lift it to the adjacent canal segment. During wet years, the proposed

Kern Delta canal system would allow for the diversion of water from the California Aqueduct to the Kern Delta agricultural canals and spreading basins.

An existing pump within the existing Arvin-Edison Forrest Frick Pump Station would also be used to meet irrigation demands in the eastern section of the Kern Delta service area through the in-lieu (pipeline) facilities. These facilities will allow the use of State Water Project (SWP) water.

The project would also include thirty-two groundwater wells to recover previously stored water in the groundwater basin. The extraction wells would be located near existing water conveyance facilities.

ENERGY ANALYSIS

The facilities requiring energy to operate the water-banking project include of five pumping stations along the proposed canal conveyance facility, thirty-two new groundwater wells which will be utilized to withdraw stored water supplies, and the existing Arvin-Edison Forrest Frick Pump Station will be used to provide SWP supplies to meet irrigation demands in lieu of current groundwater extraction operations. The canal pumping stations and groundwater extraction wells are planned as motor-operated pumps with electricity to be provided from the existing Pacific Gas and Electric Company (PG&E) facilities.

Energy Rate Schedules and Metering Requirements

Energy rate schedules have been obtained from PG&E for evaluation of the power and metering requirements relevant to the operation of the pumping stations and groundwater extraction wells. PG&E recommends using schedule AG-5B, "Large Time-of-Use Agricultural Power for the Water Banking facilities. Schedule AG-5B is used for customers with high annual operation (generally over 1,200 hours) who run 24 hours per day or can minimize electric use on sum weekdays between noon and 6 p.m.

Energy rates for this schedule vary by the summer or winter season and the time of day the energy is consumed. A seasonal demand charge and a maximum-peak-period demand charge, based on peak kW usage, is also exercised. In addition to these base charges, PG&E also has a flat surcharge rate of $0.02953/kWh in

accordance with the "Energy Procurement Surcharge Schedule (EPS)". This surcharge is applied after all other calculations are made and is applicable to all kW-hours consumed. Lastly, the customer's bill includes a customer charge, a meter charge, and a one-time installation and processing charge per meter.

A summary of the AG-5B / EPS rate schedule is provided in Table 1.

TABLE 1

PG&E "AG-5B/ EPS" RATE SCHEDULE

Charges	Summer Season (May – October)	Winter Season (November – April)
Energy Charge (per kWh per month)		
Peak (12 noon–6:00 p.m.) Mon.-Fri.*	$0.14294	-
Partial Peak (8:30 a.m.-12:00 p.m.) & (6:00 p.m.-9:30 p.m.) Mon.-Fri.*	-	$0.04661
Off-Peak	$0.04088	$0.03706
Demand Charges (per kW)		
Seasonal billing demand	$6.55	$4.40
Peak Period Demand	$2.70	-
Surcharges (per kWh)		
EPS Rate for AG-5B Schedule	$0.02953	$0.02953
Monthly Base Service Charges		
Customer Charge per meter	$16.00	$16.00
Meter Charge per month	$6.00	$6.00

* Except Holidays.

Energy Analysis Model Development and Methodology

A preliminary version of the energy model has been created in Microsoft Excel using a single workbook that incorporates several worksheets. The model estimates power requirements of the proposed Water Banking facilities based on user defined operating scenarios. The following input is required by the user to perform a simulation:

1. Number of pumps operating at the five existing canal pumping stations (1 or 2 pumps @ 100 cfs each).
2. Desired flowrate for the "in lieu" element of the program (typically 25 to 30 cfs).
3. Number of groundwater wells operating during withdraw operation in dry years (between 0 to 32 groundwater wells).

4. Define seasonal operating conditions for "storage" and "withdrawal" facilities (daily hours of operation).

The total dynamic lift of each groundwater well is estimated and assumed to be consistent for each well. Electrical horsepower is calculated from the total dynamic lift, flowrate, and the overall efficiency (pump and motor). Currently the overall efficiency is estimated and a single typical value is used. However, it is anticipated that record flow rates and power data will be available and the program will utilize specific efficiencies based on the record data.

The model estimates power requirements for each of the pumping facilities along the proposed canal conveyance facility. The output tabulates the daily, monthly, and yearly facility power requirements.

Model Assumptions

Currently, the following assumptions have been made for the pumping plant facilities:

1. Combined pump and motor efficiency is 75 percent for all pumps at all plants under all conditions.
2. Arvin-Edison Forrest Frick Pumping Station has an assumed 67 percent combined pump and motor efficiency.
3. Proposed canal pumping plants will deliver 100 cfs or 200 cfs. The model currently assumes that when a pump from a pumping station is taken off-line to accommodate decreased flows, a single pump is operating at all the other pumping stations.

The following assumptions have been made for the groundwater extraction wells:

1. Combined pump and motor efficiency is 75 percent for all groundwater pumps.
2. Since the design of the wells is at conceptual levels, the power supply requirements are calculated assuming a "typical" well, and then multiplied by the number of wells.
3. Due to the lack of specific detailed design, the length of well discharge pipeline is estimated in order to calculate losses for the "typical well".
4. Each of the wells will extract groundwater at a rate of 6.25 cfs.

5. Assume negligible groundwater level drop due to extraction.

Some of these assumptions will be modified or quantified after additional data is received.

Energy Analysis Results

Preliminary analysis has been completed assuming the facilities operate at 200 cfs, 24 hours per day, until 55,500 ac-ft is stored into the groundwater basin. The initial results are presented in the following table.

TABLE 2
ENERGY ANALYSIS RESULTS

	Storage Mode [1] [2] 1 cycle = 64,750 Ac-Ft [3]	Withdrawal Mode [4] 1 cycle = 55,500 Ac-Ft
Summer Costs		
$/month	$108,000	$615,000
$/cycle	$648,000	$3,690,000
$/ac-ft	$7	$49
Winter Costs		
$/month	$82,500	$445,000
$/cycle	$495,000	$2,660,000
$ /ac-ft	$5	$35

(1) Assumes canal facilities operate 24 hours per day, 7 days per week for 20 weeks, totaling 55,500 Ac-Ft
(2) Assumes In-Lieu facilities operate during off-peak hours, totaling 9,250 Ac-Ft.
(3) 50,000 Ac-Ft storage + 9,250 Ft In-Lieu
(4) Assumes groundwater facilities operate 24 hours per day, 7 days per week.

The initial analysis estimated the electrical costs associated with operating the water banking program facilities 24 hours per day, 7 days per week. As presented in Table 1, significant savings maybe realized if the facilities were operated in a manner that minimizes peak demand charges.

CONCEPTUAL ELECTRICAL ARRANGEMENT

Based on the electrical demands estimated in the energy evaluation, conceptual one-line diagrams have been prepared for the canal pumping facilities and the groundwater pumping facilities and are attached for reference. An order of magnitude cost estimate was prepared for the new electrical equipment required between the existing PG&E 12 kV distribution power line and the pumping equipment, totaling $80,000 per site. This cost is generally accurate for both the groundwater wells and the canal pumping stations.

Typically, PG&E will install and maintain this equipment and will recover the costs in the monthly billings. Alternatively, the KDWD can install and maintain the facilities between the main distribution power line and the pumping facilities and be eligible for a "voltage discount" within their rate. Upon preliminary investigation, it is recommended that KDWD have PG&E provide, install, and maintain these facilities.

CONCLUSION

A customized spreadsheet has been developed to estimate power requirements for the Kern Delta facilities. Currently, it is assumed that all facilities operate 24 hours per day seven days per week. However, significant savings may be realized if the facilities are operated to avoid peak demand periods. It is recommended that the model presented herein be used to evaluate the potential savings associated with minimizing peak demand charges.

EXHIBIT B-2

BLACK & VEATCH Corporation

METHODOLGY FOR DETERMINING O&M COSTS & REPLACEMENT COST

Kern Delta Water District
Water Banking Program

B&V Project 99241
B&V File D.2
January 9, 2002

To: L. Mark Mulkay
Project Manager

From: Steven N. Foellmi, P.E.
Technical Manager

Prepared By: Klint Reedy, P.E.
Victor Tsai

EXECUTIVE SUMMARY

PURPOSE

The purpose of this memorandum is to evaluate the operations and maintenance (O&M) requirements associated with the Kern Delta Water District Water Banking Program components (Kern Delta Project). The recommended manufacturer O&M requirements and estimated replacement costs associated with operation of the major equipment components have been identified and tabulated. Actual maintenance history from similar facilities, and engineer's experience on similar projects were also utilized to define the O&M schedule for the facilities in the preferred project.

BACKGROUND

As part of the Water Banking Program, five new pump stations (Kern Delta pump stations No.1 through 5) would be built along the new Kern Delta Canal allowing conveyance of water between the Kern Water bank Authority (KWBA) Canal and the Arvin-Edison Canal. The pumping plants would take water from a lower canal segment and lift it to the adjacent canal segment. During wet years, the proposed Kern Delta

canal system would allow for the diversion of water from the California Aqueduct to the Kern Delta agricultural canals and spreading basins.
An existing pump within the existing Arvin-Edison Forrest Frick Pump Station would also be used to meet irrigation demands in the eastern section of the Kern Delta service area through the in-lieu (pipeline) facilities. These facilities will allow the use of SWP water "in-lieu" of local groundwater.

Lastly, the project includes 32 new groundwater wells to recover previously stored water in the groundwater basin. The extraction wells would be located near existing water conveyance facilities.

OPERATION AND MAINTENANCE INVESTIGATION

The water-banking project facilities that require O&M include the five pumping stations along a proposed canal conveyance facility, 32 new groundwater wells to withdraw stored supplies, and the existing pump within the Arvin-Edison Forrest Frick Pump Station.

A maintenance schedule for the preferred project components and a preliminary estimate for the corresponding O&M costs has been included. The schedule includes recommended procedures for operating the canal pump stations, groundwater pumps and motors, and the equipment within the Arvin-Edison Forrest Frick Pump Station. The procedures include placing the equipment in service and operating it under both normal and abnormal conditions.

Operation & Maintenance Schedule

The attached example O&M schedule is based on information and recommendations obtained from the equipment manufacturers, maintenance history from other agencies with similar equipment, and the engineer's experience on similar projects. The attached example schedule is intended to provide a general idea of the O&M procedures required for each of the major equipment components of the Water Banking Project. Prior to startup of these facilities, a more detailed O&M schedule should be developed based on specific manufacturer's manuals and shop drawing information.

Estimated O&M Costs

A preliminary estimate of the O&M costs associated with the recommended maintenance procedures for the proposed Water Banking equipment is summarized in

Table 1.

Table 1
Annual Operation & Maintenance Costs
(2002 Dollars)

Description	Cost
STORAGE MODE	
Annual Power Costs	$1,143,000
Labor (Personnel)	$435,000
Annual Maintenance Costs[1]	$54,000
Total Annual O&M Cost	**$1,632,000**
5 YR Minor overhaul of canal pumps	$25,000
20 YR Major overhaul of canal pumps	$57,000
50 YR Major canal / spreading basin equipment replacement	$2,400,000
Present Worth of Maintenance Costs [4]	**$716,817**
Cost per AC-FT of Stored Water	**$14**
WITHDRAWAL MODE	
Annual Power Costs	$6,350,000
Labor (Personnel)	$492,000
Annual Maintenance Costs[2]	$67,000
Total Annual O&M Cost	**$6,909,000**
5 YR Minor Overhaul of GW Pumps	$55,000
20 YR Major Overhaul of GW Pumps	$124,000
50 YR Major groundwater pump equipment replacement	$2,200,000
Present Worth of Maintenance Costs [3]	**$842,741**
Cost per AC-FT of Recovered Water	**$53**

[1] Maintenance costs for storage mode include idle maintenance costs for the groundwater facilities.
[2] Maintenance costs for withdrawal mode include idle maintenance costs for the canal pumps.
[3] Assumes 3% inflation & 6% discount factor.

The power costs presented in Table 1 are based on the results presented in the KDWD Water Banking Program "Energy Requirements" Technical Memorandum. Personnel costs associated with operating and maintaining the Water Banking facilities are based on 5 additional staff positions during the storage model and 6 positions during the withdrawal mode. It may be possible to utilize existing staff to assist with the operation of these facilities and minimize the total number of additional staff required. The estimated annual maintenance and overhaul costs are based on typical maintenance costs for similar facilities. Table 2 summarizes O&M costs by component.

Table 2
Operation & Maintenance Cost Summary By Component
(2002 Dollars)

Description	Annual Cost	
	In-Service	Idle
Canal Pumping Facilities		
Labor (Personnel) Costs	$210,496	$103,904
Routine Maintenance Costs	$21,000	$4,000
Annualized Major Equipment Overhaul & Replacement Costs	$57,345	-
Total O&M Costs ($ / AC-FT)	**$4**	
Energy Costs per AC-FT [1] [2]	$5	
Total Energy + O&M Costs per AC-FT	**$9**	
Spreading Basins		
Labor (Personnel)	$170,880	$33,600
Routine Maintenance Costs	$9,000	$2,000
Annualized Major Equipment Overhaul & Replacement Costs	$0	-
Total O&M Costs ($ / AC-FT)	**$3**	-
Energy Costs per AC-FT	-	
Total Energy + O&M Costs per AC-FT	**$3**	
In-lieu Facilities		
Labor (Personnel)	$5,824	$1,400
Routine Maintenance Costs	$8,000	$2,000
Annualized Major Equipment Overhaul & Replacement Costs	$5,735	-
Total O&M Costs per AC-FT	**$2.1**	-
Energy Costs per AC-FT [1] [3]	$6	
Total Energy + O&M Costs per AC-FT	**$8**	
Well Field Facilities		
Labor (Personnel)	$342,400	$40,960
Routine Maintenance Costs	$46,000	$9,000
Annualized Major Equipment Overhaul & Replacement Costs	$93,774	-
Total O&M Costs per AC-FT	**$7**	-
Energy Costs per AC-FT [1] [4]	$35	
Total Energy + O&M Costs per AC-FT	**$42**	
Canal / Pipeline Facilities		
Labor (Personnel) Costs	$23,720	$4,016
Routine Maintenance Costs	$18,000	$3,000
Annualized Major Equipment Overhaul & Replacement Costs	$7,335	-
Total O&M Costs ($ / AC-FT)	**$6.3**	

(1) Reference Kern Delta Water Banking Project Energy Requirements Memorandum, dated February 27, 2002.
(2) Assumes winter demand charges, if operated in summer months additional $5/AC-FT will be realized.
(3) Assumes winter demand charges, if operated in summer months additional $6/AC-FT will be realized.
(4) Assumes winter demand charges, if operated in summer months additional $35/AC-FT will be realized.

Exhibit C

CERTIFICATION THAT CONDITIONS PRECEDENT HAVE BEEN SATISFIED OR WAIVED

Kern Delta Water District and The San Bernardino Valley Municipal Water District hereby jointly certify that:

1) All conditions precedent set forth in Sections 8.1 of the Agreement titled _____, dated _____, have been satisfied or waived.
2) No Event of Default exists under the Agreement.

Capitalized terms used herein and not otherwise defined are as defined in the Agreement

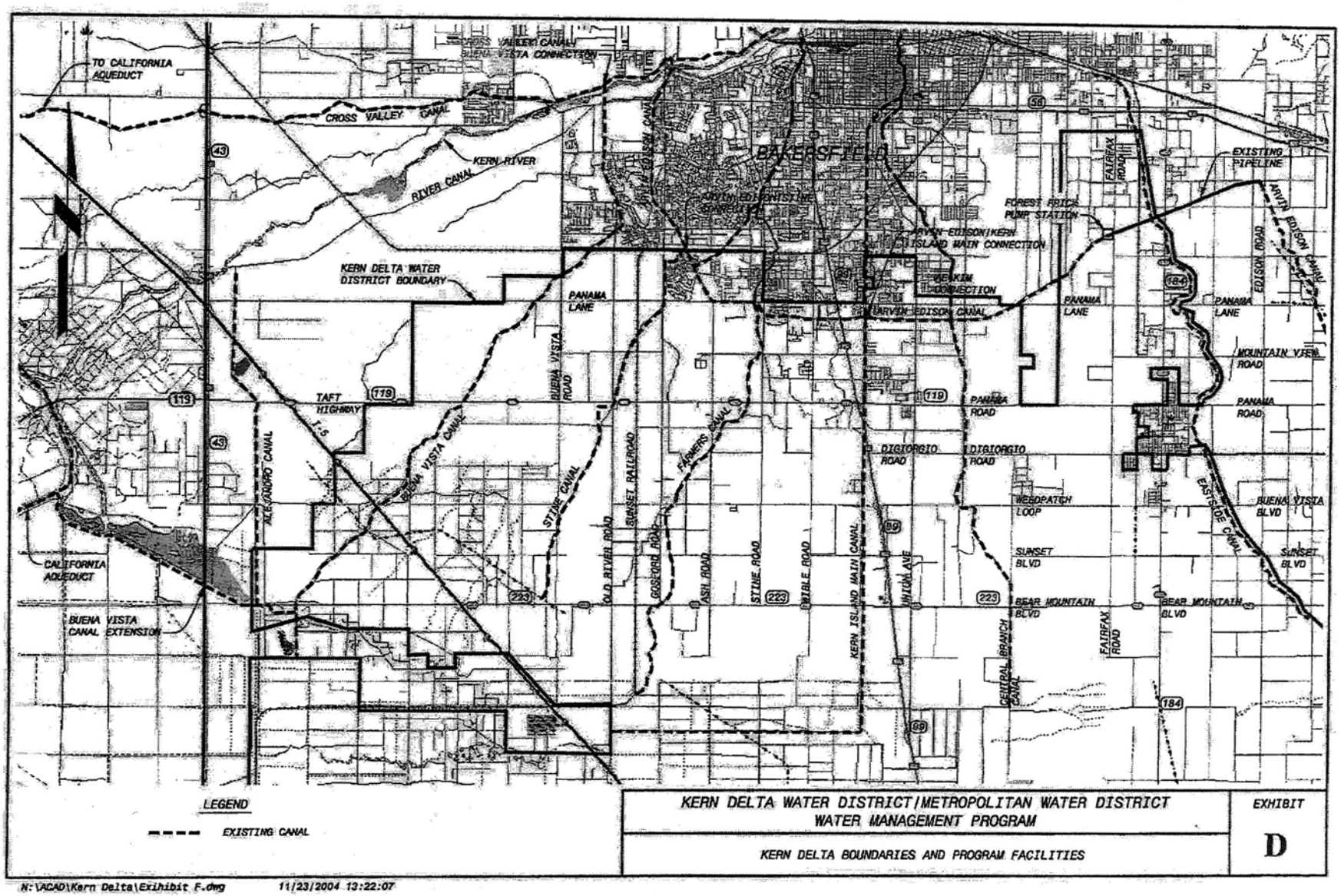
Dated: _____, 2011

Kern Delta Water District

_____

The San Bernardino Valley Municipal Water District

_____


TO CALIFORNIA AQUEDUCT
CROSS VALLEY CANAL
BUENA VISTA CONNECTION
CROSS VALLEY CANAL
KERN RIVER
RIVER CANAL
BAKERSFIELD
ARVIN-EDISON/STINE CANAL
ARVIN-EDISON/KERN ISLAND MAIN CONNECTION
FOREST FRICK PUMP STATION
EXISTING PIPELINE
ARVIN EDISON CANAL
EDISON ROAD
FAIRFAX ROAD
KERN DELTA WATER DISTRICT BOUNDARY
PANAMA LANE
BUENA VISTA ROAD
ARVIN-EDISON CONNECTION
ARVIN EDISON CANAL
MOUNTAIN VIEW ROAD
TAFT HIGHWAY
I-5
ALLGOOD CANAL
BUENA VISTA CANAL
STINE CANAL
OLD RIVER ROAD
SUNSET RAILROAD
GOSFORD ROAD
FARMERS CANAL
ASIL ROAD
STINE ROAD
ORTIBLE ROAD
KERN ISLAND MAIN CANAL
UNION AVE
DIGIORGIO ROAD
WEEDPATCH LOOP
SUNSET BLVD
BEAR MOUNTAIN BLVD
CENTRAL BRANCH CANAL
EASTSIDE CANAL
BUENA VISTA BLVD
CALIFORNIA AQUEDUCT
BUENA VISTA CANAL EXTENSION
LEGEND
EXISTING CANAL
KERN DELTA WATER DISTRICT/METROPOLITAN WATER DISTRICT
WATER MANAGEMENT PROGRAM
KERN DELTA BOUNDARIES AND PROGRAM FACILITIES
EXHIBIT
D
N:\ACAD\Kern Delta\Exihibit F.dwg
11/23/2004 13:22:07

Kern Delta Water Storage Program

Invoice Review

INVOICED COSTS:

Cost	Agreement	June 18, 2012 Invoice
Participation Payment	$40/acre-ft	$40/acre-ft
Energy costs	Pay all energy costs	CVC Power (pass through)
Operational losses	11%	11%
OM&R Fee (spreading)	$3.52/acre-ft	$3.51/acre-ft
OM&R Fee (conveyance)	$19.88/acre-ft	$19.88/acre-ft
Exchange Cost (Rosedale)	§ 4.1.2, 5.4.1	Pass through
Exchange Cost (BVWSD)	§ 4.1.2, 5.4.1	Pass through

INVOICE AMOUNT:

	Staff Estimate	June 18, 2012
Put Cost	$2,400,000	$2,329,862.77

17,800 af

$130.89/af

RMT, 7/2/2012

Kern Delta Water District

501 TAFT HIGHWAY
BAKERSFIELD, CALIFORNIA 93307-6247
TELEPHONE (661) 834-4656
FAX (661) 836-1705

BOARD OF DIRECTORS

Rodney Palla, *President*
David L. Kaiser, *Vice President*
David C. Cosyns, *Secretary*
Kevin Antongiovanni, *Treasurer*
Donald Collins
Howard Frick
Fred Garone
Richard Tillema
Philip J. Cerro

OFFICERS & STAFF

L. Mark Mulkay
General Manager

Dirk W. Reed
Deputy General Manager

Bryan C. Duncan
Controller

McMurtrey, Hartsock & Worth
Attorneys-at-Law

June 18, 2012

Doug Headrick
General Manager
San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, Ca 92408

Re: Invoice for 2011 Storage of Regulated Water (**Invoice # WBP2012-04)**

Dear Mr. Headrick,

Pursuant to the *Agreement Between Kern Delta Water District and The San Bernardino Valley Municipal Water District for a Water Management Program,* dated October 26, 2011; please accept this letter as an invoice.

Agreement Section	Title	Rate ($/af)	Delivered Water (af)	Cost ($)
1.20	Participation Payment	40.00	30,000	$1,200,000.00
5.5.1	OM&R Spreading	3.51	30,000	$105,300.00
5.5.3	OM&R Delivery Canal	19.88	30,000	$596,400.00
5.4.1	CVC Power (variable)*	Pass Through		$232,976.36
5.4.1	Exchange Cost (Rosedale)*	Pass Through		$66,227.92
5.4.1	Exchange Cost (BVWSD)*	Pass Through		$128,967.48
			Total Due	**$2,329,862.77**

* See attachment 1 for detailed cost breakdown

APPROVE FOR PAYMENT
Initials DDH
Date 6/12/12
Project Name _____
Project Number _____
Invoice to be billed to other Entity ☐
Entity Name _____
% split or EBX Reach # _____

After this invoice, the summary of Regulated Water is as follows:

Deliveries	Regulated Water	Returned Water	Remaining Water
30,000 af	26,700 af	0 af	26,700 af

Please remit payment to:

Kern Delta Water District
501 Taft Highway
Bakersfield, Ca 93307

Thank you for your help in this matter. If you have any questions please call me at (661) 834-4656.

Sincerely,

L. Mark Mulkay

L. Mark Mulkay
General Manager
Kern Delta Water District

Enclosure(s)

Melded CVC cost (acft)	Total 2011 CVC Cost	MWD Portion of CVC Cost	Valley District Portion of CVC Cost
Acre-feet	90,139	60,139	30,000
KCWA CVC Cost	$699,981.50	$467,014.14	$232,967.36
Rosedale/ID4	$198,990.63	$132,762.71	$66,227.92
BVWSD Exchange Cost	$387,500.00	$258,532.52	$128,967.48

KCWA -- CVC Conveyance Cost		
Invoice Number	acft	dollars
24249	1632	$22,039.25
24291	1503	$6,581.25
24487 &24466	4887	$109,370.25
24810 & 24805	3959	$93,655.75
24924 & 24969	1552	$26,491.00
25021 & 25023	3998	$45,822.00
25088 & 25085	3858	$59,841.75
25191 & 25193	12530	$202,161.00
25328 & 25331	6536	$109,299.75
25429&25445	2868	$24,719.50
	43323	$699,981.50

ID#4 Exchange Cost	
acft	dollars
926	$19,298.00
817	$15,874.00
803	$7,395.75
1681	$22,263.75
4227	$64,831.50

Rosedale Exchange Cost		
Invoice Number	acft	dollars
1003	763	$4,959.50
1013	542	$6,168.00
1014	2541	$17,205.50
1015/1016	6801	$38,300.13
1017/1018	9308	$67,526.00
	19955	$134,159.13

Kern Delta Water District's Use of Improvement District No. 4's CVC Capacity

September 2011 through February 2012

	Kern Delta Wheeling through ID4 Capacity in CVC Pools 1-6*							
	Sep-11	Oct-11	Oct - 11**	Nov-11	Dec-11	Jan-12	Feb-12	Total
Pump Plant 1	926	394	423	803	1,681	-	-	4,227
Pump Plant 2	926	394	423	803	1,681	-	-	4,227
Pump Plant 3	926	258	423	447	1,410	-	-	3,464
Pump Plant 4	926	258	423	447	1,410	-	-	3,464
Pump Plant 5	926	258	423	447	1,410	-	-	3,464

	KDWD Wheeling Amount through CVC Extension***							
	Sep-11	Oct-11	Oct - 11**	Nov-11	Dec-11	Jan-12	Feb-12	Total
Pump Plant 6	526	128	423	340	1,306	4,858	6,386	13,967
AEWSD TO	*392*	*24*		*74*	*513*	*-*	*4,776*	*5,779*
KDWD to CVC Extension	**134**	**104**	**423**	**266**	**793**	**4,858**	**1,610**	**8,188**
Unlined Losses	*10*	*16*	*34*	*29*	*67*		*337*	*493*
RTO3	*124*	*88*	*388*	*237*	*-*		*-*	*837*
Pump Plant 7	-	-	-	-	726	4,858	1,273	6,857
Unlined Losses					*66*	*766*	*307*	*832*
RTO4	-	-	-	-	*660*	*4,092*	*966*	*5,718*
KCWA Power Invoice No.	24839	24991	pending	25125	25126	NA	NA	
Power Amount Billed	$19,298.00	$6,168.00	$9,706.00	$7,395.75	$22,263.75	$0.00	$0.00	

*Pursuant to the Letter Agreement between Improvement District No. 4 and Kern Delta Water District dated September 21, 2011.

**Pending invoice correction from CVC.

***Pursuant to the Agreement between Improvement District No. w and Kern Delta Water District dated February 25, 2004.

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
12/14/2011	1/13/2012

INVOICE NO. 24839

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0034-1310
450B-5131

INVOICE

IMPROVEMENT DISTRICT NO. 4

Estimated Power Costs for Kern Delta Water District's Use of
Improvement District No. 4's Cross Valley Canal Capacity
Pursuant to the Letter Agreement between Improvement District No. 4 and Kern Delta Water District dated September 21, 2011.

Canal Reach	Pumping Plant	Delivered *af*	Rate *$/af*	Total Charges
1	1	926	$3.25	$3,009.50
1	2	926	$3.25	$3,009.50
2	3	926	$3.25	$3,009.50
2	4	926	$3.25	$3,009.50
2	5	926	$5.00	$4,630.00
3	6	526	$5.00	$2,630.00
		3,704		$19,298.00

TOTAL AMOUNT DUE **$19,298.00**

CRS

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
1/11/2012	2/10/2012

INVOICE NO. 24991

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0034-1310
450B-5131

INVOICE

IMPROVEMENT DISTRICT NO. 4

Estimated Power Costs for Kern Delta Water District's Use of
Improvement District No. 4's Cross Valley Canal Capacity
Pursuant to the Letter Agreement between Improvement District No. 4 and Kern Delta Water District dated September 21, 2011.

Canal Reach	Pumping Plant	Delivered *af*	Rate *$/af*	Total Charges
1	1	394	$3.25	$1,280.50
1	2	394	$3.25	$1,280.50
2	3	258	$3.25	$838.50
2	4	258	$3.25	$838.50
2	5	258	$5.00	$1,290.00
3	6	128	$5.00	$640.00
				$6,168.00

TOTAL AMOUNT DUE **$6,168.00**

D. SEMAR 1·11·12

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☒ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
2/15/2012	3/16/2012

INVOICE NO. 25125

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0034-1310
450B-4610

INVOICE

IMPROVEMENT DISTRICT NO. 4

Estimated Power Costs for Kern Delta Water District's Use of
Improvement District No. 4's Cross Valley Canal Capacity during November 2011
Pursuant to the Letter Agreement between Improvement District No. 4 and Kern Delta Water District dated September 21, 2011.

Canal Reach	Pumping Plant	Delivered *af*	Rate *$/af*	Total Charges
1	1	803	$2.25	$1,806.75
1	2	803	$2.25	$1,806.75
2	3	447	$2.25	$1,005.75
2	4	447	$2.25	$1,005.75
2	5	447	$2.25	$1,005.75
3	6	340	$2.25	$765.00
				$7,395.75

TOTAL AMOUNT DUE **$7,395.75**

D. SOMAE 2.15.12 | Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☒ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
2/15/2012	3/16/2012

INVOICE NO. 25126

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0034-1310
450B-4610

INVOICE

IMPROVEMENT DISTRICT NO. 4

Estimated Power Costs for Kern Delta Water District's Use of
Improvement District No. 4's Cross Valley Canal Capacity during December 2011
Pursuant to the Letter Agreement between Improvement District No. 4 and Kern Delta Water District dated September 21, 2011.

Canal Reach	Pumping Plant	Delivered *af*	Rate *$/af*	Total Charges
1	1	1,681	$2.25	$3,782.25
1	2	1,681	$2.25	$3,782.25
2	3	1,681	$2.25	$3,782.25
2	4	1,410	$2.25	$3,172.50
2	5	1,410	$2.25	$3,172.50
3	6	1,306	$2.25	$2,938.50
Extension	7	726	$2.25	$1,633.50
				$22,263.75

TOTAL AMOUNT DUE **$22,263.75**

D. Semas 2.15.12 DRB

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☒ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
09/22/2011	10/24/2011

INVOICE NO. 24291

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
561B-4402

Cross Valley Canal
April 2011

Estimated power costs for deliveries of Kern Delta Water District Metropolitan Water District SWP supplies delivered to the N-2 Siphon as part of an operational exchange for deliveries of Kern County Water Agency Member Unit (KCWA M/U) Federal Section 215 deliveries to the Arvin-Edison Turnout on the CVC as well as deliveries to the P-11 Turnout as part of an operational exchange with KCWA M/U's for Federal Section 215 supplies delivered off the Friant-Kern Canal delivered to the Arvin-Edison Intake Canal; adjust for lined losses.

Canal Reach	Pumping Plant	SWP MWD Volume AF	Rate $/AF	Pumping Costs $
1	1	1,503	2.25	3,381.75
1	2	1,422	2.25	3,199.50
2	3	0	2.25	0.00
2	4	0	2.25	0.00
2	5	0	2.25	0.00
3	6	0	2.25	0.00
Extension	7	0	2.25	0.00

TOTAL AMOUNT DUE **$6,581.25**

Requested By	Prepared By	Approved By	Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
08/31/2011	09/30/2011

INVOICE NO. 24249

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
WATER B.P.

VENDOR	K0241
INVOICE #	24249
P.O. #	DWR
DATE	8-31-
AMOUNT	22,039.25
ACCT. CODE	40540

10/12/11

Cross Valley Canal
March 2011

Estimated power costs for deliveries of Kern Delta Water District SWP Article 21 supplies, Metropolitan Water District SWP supplies delivered to the Arvin-Edison Turnout as well as an operational exchange of Article 21 deliveries to the North and South Strand Ranch Turnouts for a like amount of Federal supplies delivered to River Turnout No. 2; adjust for lined losses.

Canal Reach	Pumping Plant	SWP Article 21 Volume AF	SWP MWD Volume AF	Rate $/AF	Pumping Costs $
1	1	999	1,632	2.25	5,919.75
1	2	998	1,631	2.25	5,915.25
2	3	762	1,630	2.25	5,382.00
2	4	182	1,629	2.25	4,074.75
2	5	77	1,626	2.25	3,831.75
3	6	8	1,617	2.25	3,656.25
Extension	7	0	0	2.25	0.00

TOTAL AMOUNT DUE **$28,779.75**

OF THE $28,779.75 K.D.W.D. PAID $6,740.50
BANKING PAID $22,039.25

Requested By	Prepared By	Approved By	Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
11/22/2011	12/22/2011

INVOICE NO. 24487

RECEIVED
NOV 28 2011

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0055-1100
580B-4430
020A-5103
0102-1100

Cross Valley Canal
August 2011

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of Metropoitan WD State Water Project supplies to Arvin-Edison WSD and Rosedale Rio-Bravo WSD as well as an operational exchange of Kern County Water Agency Member Units' Lower River water supplies; adjusted for lined losses. Kern Delta Water District State Water Project Table A supplies were delivered to the Section 4 Turnout as part of an operational exchange with Semitropic WSD Lower River supplies of the Kern River Channel.

Reach	KDWD SWP Volume AF	MWD SWP Volume AF	Kern River Operational Exchange Volume AF	Total $/AF [1]	Conveyance Costs Total $
1	208	4,887	0	1.00	5,095.00
2	208	4,880	750	1.00	5,838.00
3	0	2,817		1.00	2,817.00

Total Amount Due 13,750.00

TOTAL AMOUNT DUE $ 13,750.00

[1] Conveyance Fee $1.00 per Reach.

46.98%
VENDOR K0341
INVOICE # 24487
P.O. # DWR
DATE 11-28-11
AMOUNT 13,188.00
ACCT. CODE 40530
562.00 - 54600
13,188.00 - 40530
DWR
WATER B.P.
12/1/11

Requested By ☑ ORIGINAL ☐ REMITTANCE ☐ FILE
Prepared By
Approved By ☐ ACCOUNTING
Approved By ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
12/12/2011	01/11/2012

INVOICE NO. 24810

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0055-1100
580B-4430
020A-5103
0102-1100

Cross Valley Canal
September 2011

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of Metropoitan WD State Water Project supplies to Arvin-Edison WSD and Rosedale Rio-Bravo WSD as well as an operational exchange of Kern County Water Agency Member Units' Lower River water supplies; adjusted for lined losses. Kern Delta Water District State Water Project Table A supplies were delivered to the Section 4 Turnout as part of an operational exchange with Semitropic WSD Lower River supplies of the Kern River Channel.

Reach	MWD SWP Volume AF	Total $/AF [1]	Conveyance Costs Total $
1	3,959	1.00	3,959.00
2	3,952	1.00	3,952.00
3	3,280	1.00	3,280.00
		Total Amount Due	11,191.00

TOTAL AMOUNT DUE **$ 11,191.00**

[1] Conveyance Fee $1.00 per Reach.

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

December 12, 2011

Mr. Mark Mulkay
Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

Re: Estimated power and conveyance invoices for September 2011; Cross Valley Canal Water Balance Summaries for September 2011

Dear Mr. Mulkay:

Enclosed are the above referenced documents for your records and remittance. If you have any questions or require further information, please call me at (661) 634-1491.

Sincerely,

Trent Taylor
Water Resources Planner
Kern County Water Agency

Enclosures

(661) 634-1400

Mailing Address
P.O. Box 58
Bakersfield, CA 93302-0058

Street Address
3200 Rio Mirada Dr.
Bakersfield, CA 93308

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
11/22/2011	12/22/2011

INVOICE NO. 24466

RECEIVED
NOV 28 2011

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
561B-4402

Cross Valley Canal
August 2011

Estimated power costs for deliveries of Kern Delta Water District Metropolitan Water District SWP supplies delivered to Rosedale Rio-Bravo WSD and Arvin-Edison WSD as well as an operational exchange delivery with Kern County Water Agency Member Units' (750 af) delivered to the Section 4 Turnout; adjust for lined losses. Kern Delta WD also delivered their own SWP Table A supplies (303 af) to River Turnout No. 1 as part of an operational exchange with Semitropic WSD for Semitropic WSD Lower River supplies delivered to Kern Delta WD off the Kern River Channel.

Canal Reach	Pumping Plant	MWD SWP Volume AF	KDWD SWP Volume AF	Rate $/AF	Pumping Costs $
			5091		
1	1	4,883	208	3.25	16,545.75
1	2	4,880	208	3.25	16,536.00
2	3	4,877	208	3.25	16,526.25
2	4	4,357	208	3.25	14,836.25
2	5	4,354	0	5.00	21,770.00
3	6	2,813	0	5.00	14,065.00
Extension	7	0	0	5.00	0.00

4%

TOTAL AMOUNT DUE **$100,279.25**

DWR

4,097.00 — 54600
96,182.25 — 40540

VENDOR K0841
INVOICE # 24466
P.O. # DWR
DATE 11-22-11
AMOUNT 96,182.25
ACCT. CODE

WATER B.P.

12/14/11

Requested By ☑ ORIGINAL ☐ REMITTANCE | Prepared By ☐ FILE | Approved By ☐ ACCOUNTING | Approved By ☐ NUMERICAL CONTROL

Cross Valley Canal

August 2011 Deliveries - Gross AF

	Points of Entry				
	Tupman T/O SWP (AF)	CVC/Friant-Kern Intertie CVP (AF)	Pionner Inlet KR (AF)	KCWA Armco Reverse SWP Exch. (AF)	CVC Total (AF)
Deliveries by Turnout:					
N-2 Siphon	1,204	-	-	-	1,204
Rosedale Rio Bravo Turnout No. 1	5,066	-	-	-	5,066
Strand Siphons	2,287	-	-	-	2,287
North Strand Ranch Turnout	2,507	-	-	-	2,507
South Strand Ranch Turnout	742	-	-	-	742
Kern Water Bank P-11 Turnout	2,420	-	-	-	2,420
Nord Siphons	339	-	-	-	339
Section 4 Turnout	5,514	-	-	-	5,514
River Turnout No. 1	3,136	-	-	-	3,136
Rosedale Rio Bravo Turnout No. 2	2,237	750	-	-	2,987
River Turnout No. 2	1,277	-	-	-	1,277
Arvin-Edison Turnout	18,754	-	-	-	18,754
Lined Losses - Pools 1-6	126	-	-	-	126
Unlined Losses - Pool 7	355	-	-	-	355
River Turnout No. 4 to River	5,121	-	-	-	5,121
Calloway Turnout	2,747	-	-	-	2,747
Henry C. Garnett Treatment Plant	-	-	-	3,959	3,959
Cawelo Pump Station 'A'	742	-	-	-	742
Unlined Losses - Pool 8	292	-	-	-	292
Total	54,866	750	-	3,959	59,575
Deliveries by Turnout/Owner:					
N-2 Siphon					
Improvement District No. 4	35	-	-	-	35
Kern County Water Agency	271	-	-	-	271
Kern-Tulare WD - KCWA M/U	564	-	-	-	564
Lower Tule River ID - KCWA M/U	21	-	-	-	21
Pixley ID - KCWA M/U	313	-	-	-	313
Rosedale-Rio Bravo Turnout No. 1					
Rosedale-Rio Bravo WSD - AEWSD	4,303	-	-	-	4,303
Rosedale-Rio Bravo WSD - KDWD	763	-	-	-	763
Strand Siphons					
Improvement District No. 4	86	-	-	-	86
Kern County Water Agency	503	-			503
Kern-Tulare WD - KCWA M/U	1,057	-	-	-	1,057
Lower Tule River ID - KCWA M/U	52	-	-	-	52
Pixley ID - KCWA M/U	589	-	-	-	589
Nouth Strand Turnout					
Kern County Water Agency	531	-	-	-	531
Kern-Tulare WD - KCWA M/U	1,248	-	-	-	1,248
Pixley ID - KCWA M/U	728	-	-	-	728
South Strand Turnout					
Kern County Water Agency	165	-	-	-	165
Kern-Tulare WD - KCWA M/U	371	-	-	-	371
Pixley ID - KCWA M/U	206	-	-	-	206
Kern Water Bank P-11 Turnout					
Improvement District No. 4	473	-	-	-	473
Kern County Water Agency	359	-	-	-	359
Kern-Tulare WD - KCWA M/U	822	-	-	-	822
Lower Tule River ID - KCWA M/U	290	-	-	-	290
Pixley ID - KCWA M/U	476	-	-	-	476
Nord Siphons					
Improvement District No. 4	211	-	-	-	211
Lower Tule River ID - KCWA M/U	128	-	-	-	128
Section 4 Turnout					
Improvement District No. 4	147	-	-	-	147
Kern County Water Agency	1,031	-	-	-	1,031
Kern Delta Water District	516				516
Kern-Tulare WD - KCWA M/U	2,360	-	-	-	2,360
Lower Tule River ID - KCWA M/U	89	-	-	-	89
Pixley ID - KCWA M/U	1,371	-	-	-	1,371
River Turnout No. 1					
Improvement District No. 4	173	-	-	-	173
Kern County Water Agency	539	-	-	-	539
Kern Delta Water District	208	-	-	-	208
Kern-Tulare WD - KCWA M/U	1,316	-	-	-	1,316
Lower Tule River ID - KCWA M/U	105	-	-	-	105
Pixley ID - KCWA M/U	795	-	-	-	795
Rosedale Rio Bravo Turnout No. 2					
Kern County Water Agency	191	-	-	-	191
Kern Delta Water District	1,537	750	-	-	2,287
Kern-Tulare WD - KCWA M/U	332	-	-	-	332
Pixley ID - KCWA M/U	177	-	-	-	177
River Turnout No. 2					
Kern County Water Agency	299	-	-	-	299
Kern-Tulare WD - KCWA M/U	640	-	-	-	640
Pixley ID - KCWA M/U	338	-	-	-	338
Arvin-Edison Turnout					
Arvin-Edison WSD (Existing)	887	-	-	-	887
Arvin-Edison WSD (New)	1,936	-	-	-	1,936
Cawelo WD - AEWSD	2,694	-	-	-	2,694
County of Fresno - AEWSD	726	-	-	-	726
County of Tulare - AEWSD	726	-	-	-	726
Hills Valley ID - AEWSD	518	-	-	-	518
Improvement District No. 4	4,244	-	-	-	4,244
Kern County Water Agency	442	-	-	-	442
Kern Delta Water District	2,813	-	-	-	2,813
Kern-Tulare WD - KCWA M/U	607	-	-	-	607
Lower Tule River ID - KCWA M/U	2,601	-	-	-	2,601
Pixley ID - KCWA M/U	323	-	-	-	323
Tri-Valley WD - AEWSD	237	-	-	-	237
Lined Losses - Pools 1-6					
Arvin-Edison WSD (New)	48	-	-	-	48
Cawelo WD - AEWSD	11	-	-	-	11
Improvement District No. 4	17	-	-	-	17
Kern County Water Agency	29	-	-	-	29
Kern Delta Water District	21	-	-	-	21
Unlined Losses - Pools 7					
Improvement District No. 4	355	-	-	-	355
River Turnout No. 4					
Improvement District No. 4	5,121	-	-	-	5,121
Calloway Turnout					
Cawelo WD	2,747	-	-	-	2,747
Cawelo Pump Station 'A'					
Cawelo WD	742	-	-	-	742
Henry C. Garnett Treatment Plant:					
Improvement District No. 4	-	-	-	3,959	3,959
Unlined Losses - Pools 8					
Improvement District No. 4	292	-	-	-	292
Total	54,866	750	-	3,959	59,575
Existing Participant Deliveries	*19,890*	-	-	*3,959*	*14,693*
New Participant Deliveries	34,976	750	-	-	44,882
	54,866	750	-	3,959	59,575

Shading denotes forward flow deliveries based on each point of entry into the CVC: _ / _ denotes pools / pump plants utilized (for forward flow).

Kern County Water Agency

Cross Valley Canal - Tupman Turnout Water Balance

State Water Project Deliveries

Month of August 2011

Subject to Adjustment

November 22, 2011
2:09 PM

Reach 1: Pool 1 (CVC Losses), Pool 2 (N-2 Siphon, CVC Losses); Reach 2: Pool 3 (RRB 1 Turnout – CVC Losses), Pool 4 (Nord Siphons, Section 4 Pump), Pool 5 (CVC Losses – CVC Losses); Reach 3: Pool 6 (RRB 2 Turnout, RTO 2 Turnout), Pool 7 (CVC Losses – Unlined Losses); Extension: Pool 8 (RTO 3 River – Cawelo PSA)

Date	CVC Losses SWP	N-2 Siphon SWP	CVC Losses SWP	RRB 1 Turnout SWP	Strand Siphons SWP	North Strand Turnout SWP	South Strand Turnout SWP	KWB P-11 Turnout SWP	CVC Losses SWP	Nord Siphons SWP	Section 4 Pump SWP	CVC Losses SWP	RTO 1 Turnout SWP	CVC Losses SWP	RRB 2 Turnout SWP	RTO 2 Turnout SWP	CVC Losses SWP	AEWSD T.O. SWP	KTWD Siphons SWP	Unlined Losses SWP	RTO 3 River SWP	RTO 4 Turnout SWP	Unlined Losses SWP	Calloway Turnout SWP	Cawelo PSA SWP	T/O Total SWP
1	1	0	0	30	25	58	21	25	0	0	90	1	220	0	100	0	0	62	0	7	0	100	6	115	0	861
2	0	0	1	31	0	60	21	0	0	0	90	0	224	0	105	0	1	109	0	7	0	99	6	121	9	884
3	1	0	0	30	0	55	19	0	1	0	90	0	230	1	103	0	0	109	0	7	0	93	6	125	25	895
4	0	0	0	63	0	46	17	0	0	0	90	1	197	0	48	0	0	207	0	6	0	73	5	125	25	903
5	1	0	1	87	0	46	18	0	0	0	90	0	122	0	0	0	1	283	0	6	0	57	5	123	25	865
6	0	0	0	90	0	48	19	0	0	0	90	0	121	1	0	0	0	287	0	6	0	55	5	126	25	873
7	1	0	0	90	0	55	19	0	1	0	90	1	105	0	0	0	1	299	0	6	0	55	5	125	25	878
8	0	0	0	90	0	57	20	0	0	0	90	0	105	0	0	0	0	297	0	6	0	55	5	123	25	873
9	0	0	1	90	0	58	19	0	0	0	90	0	109	1	0	0	1	296	0	6	0	55	5	122	25	878
10	1	0	0	90	0	55	20	0	0	0	90	1	103	0	0	0	0	301	0	6	0	54	5	121	25	872
11	0	0	0	90	0	58	20	0	1	0	90	0	45	0	7	0	0	307	0	6	0	54	5	119	25	827
12	1	0	1	90	0	52	18	63	0	0	90	0	0	1	20	0	1	357	0	6	0	85	5	40	22	852
13	0	31	0	90	46	52	18	71	0	0	90	1	0	0	21	0	0	345	0	6	0	100	5	0	22	898
14	1	50	0	90	60	56	20	71	0	0	90	0	0	0	10	0	1	326	0	6	0	102	5	0	22	910
15	0	51	0	86	60	54	20	43	1	0	90	0	0	1	0	0	0	379	0	6	0	101	5	0	21	918
16	1	49	1	77	61	56	20	36	0	0	90	1	0	0	7	0	0	400	0	6	0	89	5	0	22	921
17	0	49	0	79	61	56	20	32	0	0	89	0	0	0	12	0	1	400	0	6	0	70	5	0	22	902
18	0	48	0	86	61	58	17	30	0	0	90	0	0	1	15	0	0	395	0	6	0	71	5	0	9	892
19	1	49	1	90	60	68	10	30	1	0	90	1	0	0	24	0	0	400	0	6	0	69	5	0	0	905
20	0	14	0	90	61	70	10	29	0	0	89	0	0	0	48	0	1	397	0	6	0	70	5	0	0	890
21	0	0	0	90	62	28	8	40	0	0	89	0	0	1	55	37	0	376	0	6	0	100	4	0	0	896
22	1	0	0	90	61	0	0	52	0	0	89	1	0	0	55	62	1	399	0	5	0	110	4	0	0	930
23	0	0	1	91	61	0	0	52	1	0	89	0	0	0	55	61	0	386	0	5	0	88	4	0	0	894
24	1	0	0	91	61	0	0	52	0	0	90	0	0	1	56	62	0	375	0	5	0	95	4	0	0	893
25	0	0	0	91	60	10	0	65	0	0	89	1	0	0	55	61	1	347	0	5	0	116	4	0	0	905
26	0	33	1	91	60	18	0	56	0	14	90	0	0	0	55	61	0	327	0	5	0	115	4	0	0	930
27	1	51	0	90	59	18	0	63	1	31	90	0	0	1	56	59	0	291	0	5	0	94	4	0	0	914
28	0	46	0	90	59	19	0	101	0	31	89	1	0	0	55	58	1	255	0	5	0	89	4	0	0	903
29	0	45	0	91	59	18	0	106	0	31	89	0	0	0	55	60	0	237	0	5	0	88	4	0	0	888
30	1	46	1	90	58	18	0	101	0	31	89	0	0	1	56	62	1	258	0	5	0	90	4	0	0	912
31	0	45	0	90	58	17	0	102	1	33	89	1	0	0	55	61	0	248	0	5	0	90	4	0	0	899
CFS	13	607	9	2,554	1,153	1,264	374	1,220	8	171	2,780	11	1,581	10	1,128	644	12	9,455	0	179	0	2,582	147	1,385	374	27,661
AF	26	1,204	18	5,066	2,287	2,507	742	2,420	16	339	5,514	22	3,136	20	2,237	1,277	24	18,754	0	355	0	5,121	292	2,747	742	54,866

	CVC Losses	N-2 Siphon	CVC Losses	RRB 1 Turnout	Strand Siphons	North Strand Turnout	South Strand Turnout	KWB P-11 Turnout	CVC Losses	Nord Siphons	Section 4 Pump	CVC Losses	RTO 1 Turnout	CVC Losses	RRB 2 Turnout	RTO 2 Turnout	CVC Losses	AEWSD T.O.	KTWD Siphons	Unlined Losses	RTO 3 River	RTO 4 Turnout	Unlined Losses	Calloway Turnout	Cawelo PSA	T/O Total
Lower Tule River Irrigation District - KCWA M/U [1]																										
Improvement District No. 4		21			52			290		128	86		105					2,601								3,286
Pixley Irrigation District - KCWA M/U [1]	[illegible]																									
Belridge WSD	[illegible]																									[illegible]
Belridge WSD (BVWSD) [4]	[illegible]																									[illegible]
Berrenda Mesa WD	[illegible]																									[illegible]
Berrenda Mesa WD (BVWSD) [4]	[illegible]																									[illegible]
Buena Vista WSD	[illegible]																									[illegible]
Kern Delta WD	[illegible]																									[illegible]
Kern Delta WD [2]	[illegible]																									[illegible]
Kern Delta WD [3]	[illegible]																									[illegible]
Lost Hills WD	[illegible]																									[illegible]
Lost Hills WD (BVWSD) [4]	[illegible]																									[illegible]
Semitropic WSD	[illegible]																									[illegible]
Semitropic WSD (BVWSD) [4]	[illegible]																									[illegible]
Semitropic WSD [5]	[illegible]																									[illegible]
Wheeler Ridge - Maricopa WSD	[illegible]																									[illegible]
Wheeler Ridge - Maricopa WSD (BVWSD) [4]	[illegible]																									[illegible]
County of Fresno - Arvin-Edison WSD																		726								726
County of Tulare - Arvin-Edison WSD																		726								726
[illegible] - Arvin-Edison WSD																		[illegible]								518
[illegible] WD - Arvin-Edison WSD																		[illegible]								297
Arvin-Edison WSD - Existing																		887								887
Arvin-Edison WSD - New	8		6						5			8		9			12	1,936								1,984
Kern-Tulare Water District - KCWA M/U [1]																										
Belridge WSD		149			266			105			555		503			74										1,652
Belridge WSD (BVWSD) [4]						101	147																			248
Berrenda Mesa WD		41			67			62			231		71			389										861
Berrenda Mesa WD (BVWSD) [4]						77	193																			270
Buena Vista WSD						117																				117
Kern Delta WD															332			607								939
Kern Delta WD [2]											111															111
Kern Delta WD [3]													45													45
Lost Hills WD		139			277			100			220		28			60										824
Lost Hills WD (BVWSD) [4]						14	31																			45
Semitropic WSD		38			109			378			608		669													1,802
Semitropic WSD (BVWSD) [4]						711																				711
Semitropic WSD [5]											321															321
Wheeler Ridge - Maricopa WSD		197			338			177			314					117										1,143
Wheeler Ridge - Maricopa WSD (BVWSD) [4]						228																				228
Rosedale Rio Bravo WSD																										
Arvin-Edison WSD				4,303																						4,303
Kern Delta WD				763																						763
Improvement District No. 4	3	35	2		86			473	2	211	147	3	173	3			4	4,244		355		5,121	292			11,154
Cawelo WD	2		1						1			2		2			3							2,747	742	3,500
Arvin-Edison WSD	[illegible]																	2,694								2,894
Kern Delta WD	4		3						3			4		3	1,537		4	2,813								4,371
Kern Delta WD (2)											516															516
Kern Delta WD (3)													208													208
Kern County Water Agency	[illegible]																									
Belridge WSD	[illegible]																									[illegible]
Belridge WSD (BVWSD) [4]	[illegible]																									[illegible]
Berrenda Mesa WD	[illegible]																									[illegible]
Berrenda Mesa WD (BVWSD) [4]	[illegible]																									[illegible]
Buena Vista WSD	[illegible]																									[illegible]
Cawelo WD - Arvin-Edison WSD	[illegible]																									[illegible]
Kern Delta WD	[illegible]																									[illegible]
Kern Delta WD [2]	[illegible]																									[illegible]
Kern Delta WD [3]	[illegible]																									[illegible]
Lost Hills WD	[illegible]																									[illegible]
Lost Hills WD (BVWSD) [4]	[illegible]																									[illegible]
Semitropic WSD	[illegible]																									[illegible]
Semitropic WSD (BVWSD) [4]	[illegible]																									[illegible]
Semitropic WSD [5]	[illegible]																									[illegible]
Wheeler Ridge - Maricopa WSD	[illegible]																									[illegible]
Wheeler Ridge - Maricopa WSD (BVWSD) [4]	[illegible]																									[illegible]
Total	26	1,204	18	5,066	2,287	2,507	742	2,420	16	339	5,514	22	3,136	20	2,237	1,277	24	18,754	0	355	0	5,121	292	2,747	742	54,866

NOTES:

[1] Kern County Water Agency Member Units' made deliveries of Federal Section 215 supplies utilizing Lower-Tule River Irrigation District, Pixley Irrigation District and Kern-Tulare Water District capacities per long-term agreements which allow for KCWA M/U's to utilize unused capacities.
[2] Deliveries of Kern Delta WD Metropiltan SWP supplies (750 af) to the Section 4 Turnout were made to the Kern County Water Agency Member Units as part of an operational exchange of KCWA M/U Lower River supplies CVC Pool 5 through the Pioneer Inlet (which was then delivered by Kern Delta WD to Rosedale Turnout No. 2).
[3] Deliveries of Kern Delta WD SWP Table A supplies (303 af) to the River Turnout No. 1 were made to Semitropic WSD as part of an operational exchange of Semitropic WSD Lower River supplies delivered to Kern Delta WD off the Kern River Channel in August 2011.
[4] Deliveries of KCWA MU water to Buena Vista WSD at the North and South Strand Ranch Turnout (3,015 af) were part of an operational exchange with Buena Vista WSD Kern River supplies delivered to the Berrenda Mesa and Pioneer Projects off the Kern River Channel.
[5] Deliveries by Semitropic WSD to the Section 4 Turnout (645 af) were part of an operational exchange with KCWA M/U Lower River water delivered off the Kern River Channel to the Pioneer Project (645 af).

	CVC Losses	N-2 Siphon	CVC Losses	RRB 1 Turnout	Strand Siphons	Strand Turnout	Strand Turnout	KWB P-11 Turnout	CVC Losses	Nord Siphons	Section 4 Pump	CVC Losses	RTO 1 Turnout	CVC Losses	RRB 2 Turnout	RTO 2 Turnout	CVC Losses	AEWSD T.O.	KTWD Siphons	Unlined Losses	RTO 3 River	RTO 4 Turnout	Unlined Losses	Calloway Turnout	Cawelo PSA	T/O Total
Arvin Edison WSD	6		6	4,303					5			8		9			12	7,817								12,168
Belridge WSD	3	300	2		536	210	296	212	2		1,117	2	1,012	1		149										3,842
Berrenda Mesa WD	1	82			132	151	381	123			455		140			766	1									2,232
Buena Vista WSD						234																				234
Cawelo WD	2		1						1			2		2			3							2,747	742	3,500
Improvement District No. 4	3	56	2		138			763	2	339	238	3	278	3			4	6,845		355		5,121	292			14,440
Kern Delta WD	4		3	763					3		750	4	303	3	2,237		4	4,092								8,166
Lost Hills WD		297			589	30	65	212			467		60			128										1,848
Semitropic WSD	4	76	3		218	1,427		758	2		1,864	2	1,343	2												5,699
Wheel Ridge - Maricopa WSD	1	393	1		674	455		352	1		625	1				234										2,737
Total	26	1,204	18	5,066	2,287	2,507	742	2,420	16	339	5,514	22	3,136	20	2,237	1,277	24	18,754	0	355	0	5,121	292	2,747	742	54,866

Kern County Water Agency

Cross Valley Canal - Pioneer Canal Inlet Water Balance

Kern River Deliveries

Month of August 2011

Subject to Adjustment

November 22, 2011
9:06 AM

		Reach 1			Reach 2										Reach 3							
		Pool 1	Pool 2		Pool 3					Pool 4			Pool 5			Pool 6		Pool 7	Pool 8			
Date	California Aqueduct KR	CVC Losses	CVC Losses	RRB 1	Strand Siphons	North Strand Turnout	South Strand Turnout	KWB P-11 Turnout	CVC Losses	Section 4 Turnout	Nord Siphons	CVC Losses	CVC Losses	Pioneer Inlet	RRB 2	CVC Losses	AEWSD Turnout	Unlined Losses	Unlined Losses	Calloway Turnout	ID4 WTP	System Loss/ Storage
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	29	29	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	35	35	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	34	34	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	45	45	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	58	58	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	48	48	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	43	43	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	43	43	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	35	35	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFS	0	0	0	0	0	0	0	0	0	0	0	0	0	378	378	0	0	0	0	0	0	0
AF	0	0	0	0	0	0	0	0	0	0	0	0	0	750	750	0	0	0	0	0	0	0
KCWA M/U Lower River Supplies [1]														750	750							
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	750	750	0	0	0	0	0	0	0

NOTES:

[1] Deliveries of Kern County Water Agency Lower River supplies in CVC Pool 5 to Kern Delta WD are part of an operational exchange of KCWA M/U Lower River supplies for Kern Delta WD SWP supplies delivered in forward flow to the Section 4 Turnout.

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
12/12/2011	01/11/2012

INVOICE NO. 24805

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
561B-4402

Cross Valley Canal
September 2011

Estimated power costs for deliveries of Kern Delta Water District Metropolitan Water District SWP supplies delivered to River Turnout No. 2 and 3, Rosedale Rio-Bravo WSD and Arvin-Edison WSD; adjust for lined losses.

Canal Reach	Pumping Plant	MWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	3,955	3.25	12,853.75
1	2	3,952	3.25	12,844.00
2	3	3,950	3.25	12,837.50
2	4	3,946	3.25	12,824.50
2	5	3,940	5.00	19,700.00
3	6	2,281	5.00	11,405.00
Extension	7	0	5.00	0.00

TOTAL AMOUNT DUE **$82,464.75**

Requested By	Prepared By	Approved By	Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Cross Valley Canal

September 2011 Deliveries - Gross AF

	Points of Entry				
	Tupman T/O SWP (AF)	CVC/Friant-Kern Intertie CVP (AF)	Pionner Inlet KR (AF)	KCWA Armco Reverse SWP Exch. (AF)	CVC Total (AF)
Deliveries by Turnout:					
N-2 Siphon	2,366	-	-	-	2,366
Rosedale Rio Bravo Turnout No. 1	5,109	-	-	-	5,109
Strand Siphons	3,142	-	-	-	3,142
North Strand Ranch Turnout	1,666	-	-	-	1,666
Kern Water Bank P-11 Turnout	3,759	-	-	-	3,759
Nord Siphons	1,825	-	-	-	1,825
Section 4 Turnout	5,100	-	-	-	5,100
River Turnout No. 1	8,257	-	-	-	8,257
Rosedale Rio Bravo Turnout No. 2	2,148	-	-	-	2,148
River Turnout No. 2	5,288	-	-	-	5,288
Arvin-Edison Turnout	10,332	-	-	-	10,332
Lined Losses - Pools 1-6	124	-	-	-	124
River Turnout No. 3 to River	1,212	-	-	-	1,212
Unlined Losses - Pool 7	121	-	-	-	121
Henry C. Garnett Treatment Plant	-	-	-	3,709	3,709
Total	50,449	-	-	3,709	54,158
Deliveries by Turnout/Owner:					
N-2 Siphon					
Cawelo WD	67	-	-	-	67
Improvement District No. 4	71	-	-	-	71
Kern County Water Agency	370	-	-	-	370
Kern-Tulare WD - KCWA M/U	917	-	-	-	917
Lower Tule River ID - KCWA M/U	439	-	-	-	439
Pixley ID - KCWA M/U	502	-	-	-	502
Rosedale-Rio Bravo Turnout No. 1					
Kern County Water Agency	34	-	-	-	34
Kern-Tulare WD - KCWA M/U	74	-	-	-	74
Lower Tule River ID - KCWA M/U	38	-	-	-	38
Pixley ID - KCWA M/U	22	-	-	-	22
Rosedale-Rio Bravo WSD	3,021	-	-	-	3,021
Rosedale-Rio Bravo WSD - AEWSD	1,608	-	-	-	1,608
Rosedale-Rio Bravo WSD - KDWD	312	-	-	-	312
Strand Siphons					
Improvement District No. 4	206	-	-	-	206
Kern County Water Agency	480	-	-	-	480
Kern-Tulare WD - KCWA M/U	1,182	-	-	-	1,182
Lower Tule River ID - KCWA M/U	628	-	-	-	628
Pixley ID - KCWA M/U	646	-	-	-	646
Nouth Strand Turnout					
Kern County Water Agency	226	-	-	-	226
Kern-Tulare WD - KCWA M/U	629	-	-	-	629
Lower Tule River ID - KCWA M/U	320	-	-	-	320
Pixley ID - KCWA M/U	342	-	-	-	342
Rosedale-Rio Bravo WSD	149	-	-	-	149
Kern Water Bank P-11 Turnout					
Cawelo WD	69	-	-	-	69
Improvement District No. 4	759	-	-	-	759
Kern County Water Agency	372	-	-	-	372
Kern-Tulare WD - KCWA M/U	1,052	-	-	-	1,052
Lower Tule River ID - KCWA M/U	878	-	-	-	878
Pixley ID - KCWA M/U	629	-	-	-	629
Nord Siphons					
Improvement District No. 4	425	-	-	-	425
Kern County Water Agency	196	-	-	-	196
Kern-Tulare WD - KCWA M/U	494	-	-	-	494
Lower Tule River ID - KCWA M/U	438	-	-	-	438
Pixley ID - KCWA M/U	272	-	-	-	272
Section 4 Turnout					
Improvement District No. 4	131	-	-	-	131
Kern County Water Agency	679	-	-	-	679
Kern-Tulare WD - KCWA M/U	1,706	-	-	-	1,706
Lower Tule River ID - KCWA M/U	811	-	-	-	811
Pixley ID - KCWA M/U	936	-	-	-	936
Rosedale-Rio Bravo WSD	837	-	-	-	837
River Turnout No. 1					
Cawelo WD	3,477	-	-	-	3,477
Cawelo WD - AEWSD	856	-	-	-	856
Improvement District No. 4	637	-	-	-	637
Improvement District No. 4 - AEWSD	6	-	-	-	6
Kern County Water Agency	530	-	-	-	530
Kern-Tulare WD - KCWA M/U	1,216	-	-	-	1,216
Lower Tule River ID - KCWA M/U	870	-	-	-	870
Pixley ID - KCWA M/U	665	-	-	-	665
Rosedale Rio Bravo Turnout No. 2					
Cawelo WD - AEWSD	771	-	-	-	771
Improvement District No. 4 - AEWSD	6	-	-	-	6
Improvement District No. 4 - KDWSD	184	-	-	-	184
Kern County Water Agency	89	-	-	-	89
Kern Delta Water District	660	-	-	-	660
Kern-Tulare WD - KCWA M/U	136	-	-	-	136
Pixley ID - KCWA M/U	72	-	-	-	72
Rosedale-Rio Bravo WSD - KDWD	230	-	-	-	230
River Turnout No. 2					
Cawelo WD - AEWSD	174	-	-	-	174
Improvement District No. 4 - KDWSD	216	-	-	-	216
Kern County Water Agency	682	-	-	-	682
Kern Delta Water District	991	-	-	-	991
Kern-Tulare WD - KCWA M/U	1,682	-	-	-	1,682
Lower Tule River ID - KCWA M/U	620	-	-	-	620
Pixley ID - KCWA M/U	923	-	-	-	923
Arvin-Edison Turnout					
Arvin-Edison WSD (Existing)	887	-	-	-	887
Arvin-Edison WSD (New)	1,945	-	-	-	1,945
Cawelo WD - AEWSD	2,049	-	-	-	2,049
County of Fresno - AEWSD	726	-	-	-	726
County of Tulare - AEWSD	726	-	-	-	726
Hills Valley ID - AEWSD	518	-	-	-	518
Improvement District No. 4 - AEWSD	50	-	-	-	50
Improvement District No. 4 - KDWSD	392	-	-	-	392
Kern County Water Agency	463	-	-	-	463
Kern Delta Water District	1,895	-	-	-	1,895
Kern-Tulare WD - KCWA M/U	290	-	-	-	290
Pixley ID - KCWA M/U	154	-	-	-	154
Tri-Valley WD - AEWSD	237	-	-	-	237
Lined Losses - Pools 1-6					
Arvin-Edison WSD (New)	39	-	-	-	39
Cawelo WD - AEWSD	12	-	-	-	12
Improvement District No. 4	9	-	-	-	9
Kern County Water Agency	33	-	-	-	33
Kern Delta Water District	27	-	-	-	27
Rosedale-Rio Bravo WSD	4	-	-	-	4
Unlined Losses - Pools 7					
Improvement District No. 4	46	-	-	-	46
Kern Delta Water District	75	-	-	-	75
River Turnout No. 3					
Improvement District No. 4	627	-	-	-	627
Kern Delta Water District	585	-	-	-	585
Henry C. Garnett Treatment Plant:					
Improvement District No. 4	-	-	-	3,709	3,709
Total	50,449	-	-	3,709	54,158
Existing Participant Deliveries	*40,078*	-	-	*3,709*	*43,787*
New Participant Deliveries	10,371	-	-	-	10,371
	50,449	-	-	3,709	54,158

Shading denotes forward flow deliveries based on each point of entry into the CVC; _/_ denotes pools / pump plants utilized (for forward flow).

Cross Valley Canal - Tupman Turnout Water Balance

State Water Project Deliveries

Month of September 2011

Subject to Adjustment

December 12, 2011
11:18 AM

	Reach 1				Reach 2											Reach 3						Extension				
	Pool 1	Pool 2			Pool 3					Pool 4			Pool 5			Pool 6		Pool 7				Pool 8				
Date	CVC Losses SWP	N-2 Siphon SWP	CVC Losses SWP	RRB 1 Turnout SWP	Strand Siphons SWP	North Strand Turnout SWP	South Strand Turnout SWP	KWB P-11 Turnout SWP	CVC Losses SWP	Nord Siphons SWP	Section 4 Pump SWP	CVC Losses SWP	RTO 1 Turnout SWP	CVC Losses SWP	RRB 2 Turnout SWP	RTO 2 Turnout SWP	CVC Losses SWP	AEWSD T.O. SWP	KTWD Siphons SWP	Unlined Losses SWP	RTO 3 River SWP	RTO 4 Turnout SWP	Unlined Losses SWP	Calloway Turnout SWP	Cawelo PSA SWP	T/O Total SWP
1	1	46	1	90	59	18	0	92	0	33	89	0	0	1	55	39	1	253	0	5	33	0	0	0	0	816
2	0	47	0	90	58	18	0	92	0	33	88	0	0	0	55	63	0	234	0	5	82	0	0	0	0	865
3	1	46	0	90	58	17	0	92	1	33	88	1	0	0	55	66	0	240	0	5	82	0	0	0	0	875
4	0	46	1	89	59	18	0	92	0	34	88	0	0	1	55	66	1	241	0	5	82	0	0	0	0	878
5	1	45	0	89	58	17	0	92	0	33	88	0	94	0	31	66	0	231	0	3	37	0	0	0	0	885
6	0	47	0	90	58	18	0	88	0	34	88	1	128	0	0	89	1	225	0	0	0	0	0	0	0	867
7	1	47	0	90	59	19	0	83	1	34	88	0	134	1	0	106	0	216	0	0	0	0	0	0	0	879
8	0	46	1	89	59	18	0	83	0	33	88	0	150	0	0	106	1	211	0	0	0	0	0	0	0	885
9	0	47	0	90	59	18	0	83	0	34	85	1	150	0	0	110	0	210	0	0	0	0	0	0	0	887
10	1	46	0	87	24	17	0	27	0	33	80	0	150	1	0	114	0	210	0	0	0	0	0	0	0	790
11	0	46	1	89	0	23	0	0	1	32	83	0	145	0	0	118	1	211	0	0	0	0	0	0	0	750
12	1	46	0	89	32	25	0	37	0	32	88	1	141	1	0	115	0	208	0	0	0	0	0	0	0	816
13	0	45	0	90	61	25	0	83	0	32	87	0	142	0	0	111	1	205	0	0	0	0	0	0	0	882
14	1	46	0	90	60	27	0	83	0	31	89	0	148	0	0	110	0	205	0	0	0	0	0	0	0	890
15	0	46	1	90	60	29	0	83	1	31	90	1	154	1	0	108	0	207	0	0	0	0	0	0	0	902
16	1	46	0	91	60	29	0	83	0	31	90	0	191	0	0	110	1	183	0	0	0	0	0	0	0	896
17	0	47	0	91	61	35	0	85	0	31	89	0	216	0	0	114	0	143	0	0	0	0	0	0	0	892
18	0	46	1	91	60	40	0	55	0	31	90	1	216	1	0	115	0	147	0	0	0	0	0	0	0	894
19	1	47	0	91	61	41	0	56	1	31	90	0	223	0	0	113	1	148	0	0	0	0	0	0	0	904
20	0	47	0	91	60	42	0	56	0	31	90	0	223	0	0	112	0	148	0	0	0	0	0	0	0	900
21	0	47	0	91	61	40	0	56	0	31	90	1	216	1	0	108	1	148	0	0	0	0	0	0	0	691
22	1	50	1	92	60	41	0	55	0	31	90	0	221	0	0	108	0	128	0	0	0	0	0	0	0	878
23	0	23	0	38	29	18	0	18	1	15	59	0	140	1	42	81	0	84	0	0	0	0	0	0	0	559
24	1	37	0	15	35	20	0	15	0	17	51	1	73	0	95	60	1	88	0	0	0	0	0	0	0	509
25	0	57	1	91	77	45	0	56	0	39	86	0	139	1	95	60	0	122	0	0	0	0	0	0	0	669
26	0	20	0	90	59	32	0	54	0	31	84	0	185	0	95	60	0	117	0	13	30	0	0	0	0	870
27	1	0	0	91	58	32	0	53	1	32	84	1	185	0	96	60	1	118	0	7	86	0	0	0	0	906
28	0	0	0	90	59	33	0	52	0	32	85	0	172	1	95	59	0	118	0	6	59	0	0	0	0	861
29	0	0	1	91	58	36	0	51	0	32	91	0	150	0	111	59	1	100	0	6	59	0	0	0	0	848
30	1	34	0	90	22	49	0	60	0	13	95	1	77	0	203	60	0	120	0	6	61	0	0	0	0	892
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFS	13	1,193	9	2,576	1,584	840	0	1,895	7	920	2,571	10	4,163	11	1,083	2,666	12	5,209	0	61	611	0	0	0	0	25,434
AF	26	2,366	18	5,109	3,142	1,666	0	3,759	14	1,825	5,100	20	8,257	22	2,148	5,288	24	10,332	0	121	1,212	0	0	0	0	50,449

Pixley Irrigation District - KCWA M/U [1]																										
Belridge WSD		118			152			66			166		104			7										685
Berrenda Mesa WD		34									107		77			398										616
Buena Vista WSD						318																				318
Improvement District No. 4		40			117			433		242	75		363							17	228					1,515
Lost Hills WD		115			186			66			151		99			67										684
Rosedale Rio-Bravo WSD				38		2					11															51
Semitropic WSD		34			73			232		186	135		161													831
Wheeler Ridge - Maricopa WSD		97			118			81			166		66			78										607
Pixley Irrigation District - KCWA M/U [1]																										
Belridge WSD		155			200			85			1216		135			102										893
Berrenda Mesa WD		148									948		108			550										852
Buena Vista WSD						342																				342
Kern Delta WD [2]															72	102		154			32					364
Lost Hills WD		157			228			143			207		138			92										963
Rosedale Rio-Bravo WSD				22							16															38
Semitropic WSD		46			101			323		273	187		223													1,151
Wheeler Ridge - Maricopa WSD		96			117			79			162		95			77										596
County of Fresno - Arvin-Edison WSD																		726								726
County of Tulare - Arvin-Edison WSD																		728								728
Improvement District No. 4																		518								518
Kern Valley WD - Arvin-Edison WSD																		237								237
Arvin-Edison WSD - Existing																		887								887
Arvin-Edison WSD - KCWA M/U [1]																		645								645
Kern-Tulare Water District - KCWA M/U [1]																										
Belridge WSD		297			384			165			415		259			194										1,714
Berrenda Mesa WD		86									271		194			1,008										1,559
Buena Vista WSD						625																				625
Kern Delta WD [2]															136	182		290		14	64					686
Lost Hills WD		284			411			164			375		244			165										1,643
Rosedale Rio-Bravo WSD				74		4					20															98
Semitropic WSD		84			184			585		494	341		406													2,094
Wheeler Ridge - Maricopa WSD		168			203			138			284		113			133										1,037
Rosedale Rio-Bravo WSD	2			3,021		149					837															4,011
Arvin-Edison WSD				1,608																						1,608
Kern Delta WD [2]				312											230											542
Improvement District No. 4	2	71	2		206			759	2	425	131	1	637	1			1			29	399					2,666
Arvin-Edison WSD													6		6			50								62
Kern Delta WD [2]															184	218		392		10	124					926
Cawelo WD - [3]																										
Arvin-Edison WSD [3]													656		77	74		2,049								3,850
Cawelo WD - Belridge WSD [3]	2							22				2	477	6	680	991	8	1,895		44	342					3,510
Kern Delta WD [2]	4											4		6	680	991	8	1,895		44	342					3,959
Kern County Water Agency																										
Belridge WSD	2	116			149			64			181		161			175										672
Berrenda Mesa WD	1	34			5						108	2	77			400	2									631
Buena Vista WSD	1						224																			226
Cawelo WD - Arvin-Edison WSD [3]													43		36	9		350								438
Kern Delta WD [2]															53	74		113		3	23					266
Lost Hills WD	2	114			165			15			151		98			166										615
Rosedale Rio-Bravo WSD				34		2																				36
Semitropic WSD	9	34	3		78			233	2	196	136	2	162													844
Wheeler Ridge - Maricopa WSD	1	72			88			60			123	1	49			58										452
Total	26	2,366	18	5,109	3,142	1,666	0	3,759	14	1,825	5,100	20	8,257	22	2,148	5,288	24	10,332	0	121	1,212	0	0	0	0	50,449

NOTES:

[1] Kern County Water Agency Member Units' made deliveries of Federal Section 215 supplies utilizing Lower-Tule River Irrigation District, Pixley Irrigation District and Kern-Tulare Water District capacities per long-term agreements which allow for KCWA M/U's to utilize unused capacities.

[2] Deliveries of Arvin-Edison WSD and Kern Delta WD MWD SWP Table A supplies to River Turnout No. 1 and 2 were delivered to the City of Bakersfield in lieu of Rosedale Rio-Bravo WSD as part of an exchange to accommodate the City of Bakersfield Westside Parkway Project impacts to Rosedale Rio-Bravo WSD conveyance facilities. These deliveries will be paid back by the City ro Rosedale Rio-Bravo WSD.

[3] Deliveries of Cawelo WD SWP Table A supplies delivered to the KWB were transferred to Belridge WSD as part of an exchange of 4,000 af of Belridge WSD Federal supplies delivered off the Friant-Kern Canal to Cawelo WD.

	CVC Losses	N-2 Siphon	CVC Losses	RRB 1 Turnout	Strand Siphons	Strand Turnout	Strand Turnout	KWB P-11 Turnout	CVC Losses	Nord Siphons	Section 4 Pump	CVC Losses	RTO 1 Turnout	CVC Losses	RRB 2 Turnout	RTO 2 Turnout	CVC Losses	AEWSD T.O.	KTWD Siphons	Unlined Losses	RTO 3 River	RTO 4 Turnout	Unlined Losses	Calloway Turnout	Cawelo PSA	T/O Total
Arvin Edison WSD	6	0	4	1,608	0	0	0	0	3	0	0	6	905	9	813	183	11	7,488	0	0	0	0	0	0	0	11,036
Belridge WSD	2	667	1	0	866	0	0	360	0	0	956	0	568	0	0	448	3	0	0	0	0	0	0	0	0	3,994
Berrenda Mesa WD	1	202	1	0	5	0	0	0	1	0	634	2	454	0	0	2,356	2	0	0	0	0	0	0	0	0	3,658
Buena Vista WSD	5	0	0	0	0	1,509	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,511
Cawelo WD	2	67	1	0	0	0	0	69	1	0	0	2	3,477	6	0	0	0	0	0	0	0	0	0	0	0	3,625
Improvement District No. 4	2	111	2	0	323	0	0	182	2	867	208	4	1,000	6	0	0	0	0	0	46	827	0	0	0	0	4,181
Kern Delta WD	4	0	3	312	0	0	0	0	2	0	0	4	0	6	1,335	1,565	8	2,844	0	75	585	0	0	0	0	6,743
Lost Hills WD	5	670	3	0	670	0	0	386	1	0	884	4	677	0	0	0	0	390	0	0	0	0	0	0	0	3,985
Rosedale Rio-Bravo WSD	2	0	1	3,189	0	157	0	0	1	0	884	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,234
Semitropic WSD	10	198	3	0	431	0	0	1,372	2	1,458	765	12	652	0	0	0	0	0	0	0	0	0	0	0	0	4,920
Wheel Ridge - Maricopa WSD	1	431	0	0	527	0	0	358	0	0	735	1	293	0	0	346	0	0	0	0	0	0	0	0	0	2,692
Total	26	2,366	18	5,109	3,142	1,666	0	3,759	14	1,825	5,100	20	8,257	22	2,148	5,288	24	10,332	0	121	1,212	0	0	0	0	50,449

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
01/06/2012	02/06/2012

INVOICE NO. 24924

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
561B-4402

Cross Valley Canal
October 2011

Estimated power costs for deliveries of Kern Delta Water District Metropolitan Water District SWP supplies delivered to River Turnout No. 2 and 3, Rosedale Rio-Bravo WSD and Arvin-Edison WSD; adjust for lined losses.

Canal Reach	Pumping Plant	MWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	1,551	3.25	5,040.75
1	2	1,550	3.25	5,037.50
2	3	978	3.25	3,178.50
2	4	977	3.25	3,175.25
2	5	976	5.00	4,880.00
3	6	441	5.00	2,205.00
Extension	7	0	5.00	0.00

TOTAL AMOUNT DUE **$23,517.00**

Requested By	Prepared By	Approved By	Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
01/06/2012	02/06/2012

INVOICE NO. 24969

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0055-1100
580B-4430
020A-5103
0102-1100

Cross Valley Canal
October 2011

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of Metropoitan WD State Water Project supplies to Arvin-Edison WSD and Rosedale Rio-Bravo WSD; adjusted for lined losses.

Reach	MWD SWP Volume AF	Total $/AF [1]	Conveyance Costs Total $
1	1,552	1.00	1,552.00
2	979	1.00	979.00
3	443	1.00	443.00
		Total Amount Due	2,974.00

TOTAL AMOUNT DUE **$ 2,974.00**

[1] Conveyance Fee $1.00 per Reach.

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Cross Valley Canal

October 2011 Deliveries - Gross AF

	Points of Entry				
	Tupman T/O SWP (AF)	CVC Dewatering Deliveries (AF)	Pionner Inlet KR (AF)	KCWA Armco Reverse SWP Exch. (AF)	CVC Total (AF)
Deliveries by Turnout:					
N-2 Siphon	597	-	-	-	597
Rosedale Rio Bravo Turnout No. 1	2,918	232	-	-	3,150
North Strand Ranch Turnout	1,726	-	-	-	1,726
South Strand Ranch Turnout	276	-	-	-	276
Kern Water Bank P-11 Turnout	1,224	-	-	-	1,224
Section 4 Turnout	2,741	-	-	-	2,741
River Turnout No. 1	4,491	81	-	-	4,572
Rosedale Rio Bravo Turnout No. 2	7,053	-	-	-	7,053
River Turnout No. 2	1,252	52	-	-	1,304
Arvin-Edison Turnout	2,698	-	-	-	2,698
Refill	365	-	-	-	365
Lined Losses - Pools 1-6	80	-	-	-	80
River Turnout No. 3 to River	797	-	-	-	797
Unlined Losses - Pool 7	125	-	-	-	125
Henry C. Garnett Treatment Plant	-	-	-	3,709	3,709
Total	26,343	365	-	3,709	30,417
Deliveries by Turnout/Owner:					
N-2 Siphon					
Cawelo WD	597	-	-	-	597
Rosedale-Rio Bravo Turnout No. 1					
Cawelo WD - AEWSD	193	-	-	-	193
Improvement District No. 4 - KDWSD	136	-	-	-	136
Kern County Water Agency	89	-	-	-	89
Kern Delta Water District	571	-	-	-	571
Kern-Tulare WD - KCWA M/U	162	-	-	-	162
Lower Tule River ID - KCWA M/U	276	-	-	-	276
Pixley ID - KCWA M/U	276	-	-	-	276
Rosedale-Rio Bravo WSD	1,215	232	-	-	1,447
Nouth Strand Turnout					
Kern County Water Agency	153	-	-	-	153
Kern-Tulare WD - KCWA M/U	252	-	-	-	252
Rosedale-Rio Bravo WSD	1,321	-	-	-	1,321
South Strand Turnout					
Kern County Water Agency	12	-	-	-	12
Kern-Tulare WD - KCWA M/U	20	-	-	-	20
Rosedale-Rio Bravo WSD	244	-	-	-	244
Kern Water Bank P-11 Turnout					
Cawelo WD	808	-	-	-	808
Kern County Water Agency	298	-	-	-	298
Kern-Tulare WD - KCWA M/U	118	-	-	-	118
Section 4 Turnout					
Improvement District No. 4	46	-	-	-	46
Improvement District No. 4 - KCWA	565	-	-	-	565
Kern County Water Agency	653	-	-	-	653
Kern-Tulare WD - KCWA M/U	1,477	-	-	-	1,477
River Turnout No. 1					
Cawelo WD	775	14	-	-	789
Improvement District No. 4	19	-	-	-	19
Improvement District No. 4 - KCWA	1,935	35	-	-	1,970
Kern County Water Agency	557	32	-	-	589
Kern-Tulare WD - KCWA M/U	1,205	-	-	-	1,205
Rosedale Rio Bravo Turnout No. 2					
Cawelo WD - AEWSD	1,460	-	-	-	1,460
Improvement District No. 4	627	-	-	-	627
Improvement District No. 4 - KDWD	130	-	-	-	130
Kern County Water Agency	30	-	-	-	30
Kern Delta Water District	533	-	-	-	533
Kern-Tulare WD - KCWA M/U	59	-	-	-	59
Lower Tule River ID - KCWA M/U	2,107	-	-	-	2,107
Pixley ID - KCWA M/U	2,107	-	-	-	2,107
Rosedale-Rio Bravo WSD	-	52	-	-	52
River Turnout No. 2					
Kern County Water Agency	396	-	-	-	396
Kern-Tulare WD - KCWA M/U	856	-	-	-	856
Arvin-Edison Turnout					
Arvin-Edison WSD (Existing)	315	-	-	-	315
Arvin-Edison WSD (New)	975	-	-	-	975
Cawelo WD - AEWSD	266	-	-	-	266
County of Fresno - AEWSD	225	-	-	-	225
County of Tulare - AEWSD	225	-	-	-	225
Hills Valley ID - AEWSD	168	-	-	-	168
Improvement District No. 4 - AEWSD	189	-	-	-	189
Improvement District No. 4 - KDWD	24	-	-	-	24
Kern County Water Agency	117	-	-	-	117
Kern Delta Water District	99	-	-	-	99
Kern-Tulare WD - KCWA M/U	11	-	-	-	11
Tri-Valley WD - AEWSD	84	-	-	-	84
Lined Losses - Pools 1-6					
Arvin-Edison WSD (New)	35	-	-	-	35
Cawelo WD	10	-	-	-	10
Improvement District No. 4	6	-	-	-	6
Improvement District No. 4 - KCWA	12	-	-	-	12
Kern County Water Agency	4	-	-	-	4
Kern Delta Water District	7	-	-	-	7
Kern Tulare Water District	2	-	-	-	2
Rosedale-Rio Bravo WSD	4	-	-	-	4
Refill					
Cawelo WD	14	-	-	-	14
Improvement District No. 4 - KCWA	35	-	-	-	35
Kern County Water Agency	32	-	-	-	32
Rosedale-Rio Bravo WSD	284	-	-	-	284
Unlined Losses - Pools 7					
Improvement District No. 4	50	-	-	-	50
Kern County Water Agency	3	-	-	-	3
Kern Delta Water District	65	-	-	-	65
Kern Tulare Water District	7	-	-	-	7
River Turnout No. 3					
Improvement District No. 4	476	-	-	-	476
Kern County Water Agency	13	-	-	-	13
Kern Delta Water District	277	-	-	-	277
Kern Tulare Water District	31	-	-	-	31
Henry C. Garnett Treatment Plant:					
Improvement District No. 4	-	-	-	3,709	3,709
Total	26,343	365	-	3,709	30,417
Existing Participant Deliveries	*21,459*	*333*	-	*3,709*	*19,219*
New Participant Deliveries	4,884	32	-	-	11,198
	26,343	365	-	3,709	30,417

Shading denotes forward flow deliveries based on each point of entry into the CVC; _ / _ denotes pools / pump plants utilized (for forward flow).

Kern County Water Agency
Cross Valley Canal - Tupman Turnout Water Balance
State Water Project Deliveries
Month of October 2011
Subject to Adjustment

January 5, 2012
10:27 AM

	Reach 1					Pool 3						Reach 2						Reach 3								Extension			
	Pool 1	Pool 2										Pool 4				Pool 5			Pool 6			Pool 7				Pool 8			
Date	CVC Losses SWP	CVC Refill SWP	N-2 Siphon SWP	CVC Losses SWP	RRB 1 Turnout SWP	Strand Siphons SWP	North Strand Turnout SWP	South Strand Turnout SWP	KWB P-11 Turnout SWP	CVC Losses SWP	CVC Refill SWP	Nord Siphons SWP	Section 4 Pump SWP	CVC Losses SWP	CVC Refill SWP	RTO 1 Turnout SWP	CVC Losses SWP	CVC Refill SWP	RRB 2 Turnout SWP	RTO 2 Turnout SWP	CVC Losses SWP	CVC Refill SWP	AEWSD T.O. SWP	KTWD Siphons SWP	Unlined Losses SWP	RTO 3 River SWP	RTO 4 Turnout SWP	Unlined Losses SWP	Calloway Turnout SWP	Cawelo PSA SWP	T/O Total SWP
1	0	0	48	1	90	0	51	0	68	0	0	0	94	0	0	27	1	0	230	38	0	0	145	0	5	60	0	0	0	0	858
2	1	0	49	0	90	0	50	0	68	0	0	0	94	1	0	27	0	0	242	60	1	0	139	0	5	60	0	0	0	0	887
3	0	0	49	0	90	0	51	0	69	1	0	0	94	0	0	26	0	0	247	59	0	0	135	0	5	61	0	0	0	0	887
4	1	0	48	1	90	0	55	0	67	0	0	0	93	1	0	113	1	0	247	60	1	0	89	0	2	25	0	0	0	0	894
5	0	0	48	0	90	0	59	0	66	0	0	0	91	0	0	175	0	0	248	60	0	0	56	0	0	0	0	0	0	0	893
6	1	0	49	0	90	0	61	0	59	1	0	0	90	0	0	219	1	0	249	23	1	0	53	0	0	0	0	0	0	0	897
7	0	0	10	0	90	0	65	0	51	0	0	0	89	1	0	276	0	0	248	0	0	0	51	0	0	0	0	0	0	0	881
8	0	0	0	0	90	0	64	0	52	0	0	0	89	0	0	295	1	0	248	0	1	0	51	0	0	0	0	0	0	0	891
9	0	0	0	0	90	0	55	0	44	1	0	0	91	0	0	295	0	0	181	0	0	0	20	0	0	0	0	0	0	0	777
10	0	0	0	0	38	0	20	0	15	0	0	0	34	1	0	123	0	0	54	0	0	0	0	0	0	0	0	0	0	0	285
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	1	74	0	0	33	0	21	0	22	0	28	0	29	0	26	20	0	29	42	13	0	26	0	0	0	0	0	0	0	0	181
25	0	0	0	1	84	0	36	0	36	1	0	0	63	1	0	53	0	0	177	43	1	0	30	0	15	19	0	0	0	0	560
26	1	0	0	0	63	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
27	0	0	0	0	83	0	41	17	0	0	0	0	57	0	0	78	1	0	146	35	1	0	71	0	7	17	0	0	0	0	554
28	1	0	0	1	90	0	61	30	0	1	0	0	94	1	0	136	0	0	249	60	0	0	132	0	6	40	0	0	0	0	902
29	0	0	0	0	90	0	59	31	0	0	0	0	94	0	0	131	1	0	250	60	1	0	129	0	6	40	0	0	0	0	892
30	1	0	0	0	90	0	56	30	0	0	0	0	93	1	0	132	0	0	249	60	0	0	129	0	6	40	0	0	0	0	887
31	0	0	0	1	90	0	57	31	0	1	0	0	93	0	0	138	1	0	248	60	1	0	130	0	6	40	0	0	0	0	697
CFS	7	74	301	5	1,471	0	870	139	617	6	28	0	1,382	7	26	2,264	7	29	3,556	631	8	26	1,360	0	63	402	0	0	0	0	13,279
AF	14	147	597	10	2,918	0	1,726	276	1,224	12	56	0	2,741	14	52	4,491	14	58	7,053	1,252	16	52	2,698	0	125	797	0	0	0	0	26,343

Buena Vista Water Storage District - AEWSD Turnout																														
Cross Valley Canal																														
Cross Valley Canal - Refill																														
Cross Valley Canal - Refill - Rosedale WSD																														
Cross Valley Canal - Refill - KCWA M/U's																														
Arvin-Edison WSD - Existing																							315							315
Arvin-Edison WSD - Federal																														
Kern Delta Water District - KCWA M/U's [1]																														
Arvin-Edison WSD												498				223														
Belridge Water Storage District												70																		
Berrenda Mesa Water District												140																		
Buena Vista Water Storage District																														
Kern Delta WD																														
Lost Hills WD												455				282														
Rosedale-Rio Bravo WSD					99		108	70																						
Semitropic WSD								18				151				640														
Tejon-Castac Water District																														
Improvement District No. 4	1			1					1			46	1			19	1		627		1				34	388				1,120
Arvin-Edison WSD																							189							189
Improvement District No. 4 / KCWA	3			2					2			565	3	8	1,935		2	27												2,547
Kern Delta WD					136														130				24		16	88				394
Lost Hills WD																														
Rosedale-Rio Bravo WSD																														
Kern Delta WD																														
Lost Hills WD																														
Rosedale-Rio Bravo WSD																														
Semitropic WSD																														
Tejon-Castac Water District																														
Total	14	147	597	10	2,918	0	1,726	276	1,224	12	56	0	2,741	14	52	4,491	14	58	7,053	1,252	16	52	2,698	0	125	797	0	0	0	0	26,343

NOTES:

[1] Arvin-Edison Water Storage District made deliveries of Metropolitan Water District State Water Project Table A supplies utilizing Lower-Tule River Irrigation District and Pixley Irrigation District capacities per a short-term agreement with North Kern WSD (per the Agreement for the Management of Conveyance Capacity in the Cross Valley Canal Capacity).

[2] Kern County Water Agency Member Units' made deliveries of State Water Project Table A supplies utilizing Lower-Tule River Irrigation District, Pixley Irrigation District and Kern-Tulare Water District capacities per long-term agreements which allow for KCWA M/U's to utilize unused capacities.

[3] Deliveries of Cross Valley Canal refill water by Rosedale Rio-Bravo WSD and the Kern County Water Agency M/U's with their 2011 State Water Project Table A supply were made persuant to the Refill/Dewatering Policy Guidelines. Rosedale Rio-Bravo and the KCWA Member Units' received dewatering supplies in October 2011 (see attached delivery summary) and were subsquently responsible for refilling the Cross Valley Canal based upon the total dewatered supplies received.

[4] In the month of October 2011, Arvin-Edison WSD delivered 632 af of Arvin-Edison WSD Federal supplies to the AEWSD Turnout as part of an operational exchange for 632 af of MWD State Water Project Table A supplies at Rosedale Rio-Bravo Turnout No. 2.

Kern County Water Agency
Cross Valley Canal
Dewatering for Maintenance Deliveries
Month of October 2011
Subject to Adjustment

January 10, 2012
2:09 PM

	Reach 1				Reach 2										Reach 3		Extension								
	Pool 1	Pool 2			Pool 3					Pool 4			Pool 5		Pool 6		Pool 7		Pool 8						
Date	CVC Losses SWP	N-2 Siphon SWP	CVC Losses SWP	RRB 1 Turnout SWP	Strand Siphons SWP	North Strand Turnout SWP	South Strand Turnout SWP	KWB P-11 Turnout SWP	CVC Losses SWP	Nord Siphons SWP	Section 4 Pump SWP	CVC Losses SWP	RTO 1 Turnout SWP	CVC Losses SWP	RRB 2 Turnout SWP	RTO 2 Turnout SWP	CVC Losses SWP	AEWSD T.O. SWP	KTWD Siphons SWP	Unlined Losses SWP	RTO 3 River SWP	RTO 4 Turnout SWP	Unlined Losses SWP	Calloway Turnout SWP	Cawelo PSA SWP	T/O Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	39	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	53
11	0	0	0	31	0	0	0	0	0	0	0	0	9	0	12	0	0	0	0	0	0	0	0	0	0	52
12	0	0	0	26	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	33
13	0	0	0	21	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	26
14	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
15	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
16	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
17	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFS	0	0	0	117	0	0	0	0	0	0	0	0	41	0	26	0	0	0	0	0	0	0	0	0	0	184
AF	0	0	0	232	0	0	0	0	0	0	0	0	81	0	52	0	0	0	0	0	0	0	0	0	0	365
Total	0	0	0	232	0	0	0	0	0	0	0	0	81	0	52	0	0	0	0	0	0	0	0	0	0	365

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
01/18/2012	02/17/2012

INVOICE NO. 25021

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
561B-4402

Cross Valley Canal
November 2011

Estimated power costs for deliveries of Kern Delta Water District Metropolitan Water District SWP supplies delivered to River Turnout No. 1, 2 and 3, Rosedale Rio-Bravo WSD and Arvin-Edison WSD; adjust for lined losses.

Canal Reach	Pumping Plant	MWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	3,995	2.25	8,988.75
1	2	3,993	2.25	8,984.25
2	3	2,256	2.25	5,076.00
2	4	2,254	2.25	5,071.50
2	5	2,252	2.25	5,067.00
3	6	1,730	2.25	3,892.50
Extension	7	0	2.25	0.00
		TOTAL AMOUNT DUE		**$37,080.00**

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
01/18/2012	02/17/2012

INVOICE NO. 25023

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0055-1100
580B-4430
020A-5103
0102-1100

Cross Valley Canal
November 2011

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of Metropoitan WD State Water Project supplies to Arvin-Edison WSD and Rosedale Rio-Bravo WSD; adjusted for lined losses.

Reach	MWD SWP Volume AF	Total $/AF [1]	Conveyance Costs Total $
1	3,998	1.00	3,998.00
2	3,012	1.00	3,012.00
3	1,732	1.00	1,732.00
		Total Amount Due	8,742.00

TOTAL AMOUNT DUE **$ 8,742.00**

[1] Conveyance Fee $1.00 per Reach.

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
02/13/2012	03/14/2012

INVOICE NO. 25088

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0055-1100
580B-4430
020A-5103
0102-1100

Cross Valley Canal
December 2011

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of San Bernardino Valley MWD State Water Project supplies to Arvin-Edison WSD and Rosedale Rio-Bravo WSD; adjusted for lined losses.

Reach	MWD SWP Volume AF	Total $/AF [1]	Conveyance Costs Total $
1	3,858	1.00	3,858.00
2	3,395	1.00	3,395.00
3	3,010	1.00	3,010.00
		Total Amount Due	10,263.00

TOTAL AMOUNT DUE **$ 10,263.00**

[1] Conveyance Fee $1.00 per Reach.

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Cross Valley Canal

December 2011 Deliveries - Gross AF

Deliveries by Turnout:	Points of Entry				
	Tupman T/O SWP (AF)	Tupman T/O FK Recirculation (AF)	Pionner Inlet KR (AF)	KCWA Armco Reverse SWP Exch. (AF)	CVC Total (AF)
N-2 Siphon	302	-	-	-	302
Rosedale Rio Bravo Turnout No. 1	3,404	-	-	-	3,404
North Strand Ranch Turnout	3,090	-	-	-	3,090
South Strand Ranch Turnout	686	-	-	-	686
Kern Water Bank P-11 Turnout	292	-	-	-	292
Section 4 Turnout	905	141	-	-	1,046
River Turnout No. 1	8,287	2,196	-	-	10,483
Rosedale Rio Bravo Turnout No. 2	13,755	-	-	-	13,755
River Turnout No. 2	3,423	861	-	-	4,284
Arvin-Edison Turnout	7,357	-	-	-	7,357
Lined Losses - Pools 1-6	120	13	-	-	133
River Turnout No. 3 to River	127	-	-	-	127
Unlined Losses - Pool 7	737	-	-	-	737
River Turnout No. 4 to River	7,030	-	-	-	7,030
Henry C. Garnett Treatment Plant	-	-	-	3,247	3,247
Unlined Losses - Pool 8	716	-	-	-	716
Total	50,231	3,211	-	3,247	56,689
Deliveries by Turnout/Participant:					
N-2 Siphon					
Tehachapi-Cummings CWD	302	-	-	-	302
Rosedale-Rio Bravo Turnout No. 1					
Arvin-Edison WSD	643	-	-	-	643
Kern Delta Water District	2,761	-	-	-	2,761
Nouth Strand Turnout					
Buena Vista WSD	32	-	-	-	32
Kern Delta Water District	3,058	-	-	-	3,058
South Strand Turnout					
Kern Delta Water District	686	-	-	-	686
Kern Water Bank P-11 Turnout					
Tehachapi-Cummings CWD	292	-	-	-	292
Section 4 Turnout					
Belridge WSD	85	61	-	-	146
Berrenda Mesa WD	85	20	-	-	105
Improvement District No. 4	48	-	-	-	48
Lost Hills WD	74	60	-	-	134
Rosedale-Rio Bravo WSD	534	-	-	-	534
Semitropic WSD	71	-	-	-	71
Tejon Castaic WD	8	-	-	-	8
River Turnout No. 1					
Belridge WSD	978	941	-	-	1,919
Berrenda Mesa WD	495	315	-	-	810
Improvement District No. 4	1,338	-	-	-	1,338
Lost Hills WD	1,050	940	-	-	1,990
Rosedale-Rio Bravo WSD	1,018	-	-	-	1,018
Semitropic WSD	3,078	-	-	-	3,078
Tehachapi-Cummings CWD	301	-	-	-	301
Tejon Castaic WD	29	-	-	-	29
Rosedale Rio Bravo Turnout No. 2					
Arvin-Edison WSD	12,967	-	-	-	12,967
Improvement District No. 4	88	-	-	-	88
Kern Delta Water District	700	-	-	-	700
River Turnout No. 2					
Belridge WSD	703	335	-	-	1,038
Berrenda Mesa WD	1,720	216	-	-	1,936
Lost Hills WD	599	310	-	-	909
Rosedale-Rio Bravo WSD	373	-	-	-	373
Semitropic WSD	28	-	-	-	28
Arvin-Edison Turnout					
Arvin-Edison WSD	5,482	-	-	-	5,482
Kern Delta Water District	1,875	-	-	-	1,875
Lined Losses - Pools 1-6					
Arvin-Edison WSD	53	-	-	-	53
Belridge WSD	-	6	-	-	6
Berrenda Mesa WD	4	2	-	-	6
Improvement District No. 4	20	-	-	-	20
Kern Delta Water District	28	-	-	-	28
Lost Hills WD	-	5	-	-	5
Rosedale-Rio Bravo WSD	5	-	-	-	5
Semitropic WSD	10	-	-	-	10
River Turnout No. 3					
Improvement District No. 4	127	-	-	-	127
Unlined Losses - Pools 7					
Improvement District No. 4	492	-	-	-	492
Kern Delta Water District	245	-	-	-	245
River Turnout No. 4					
Improvement District No. 4	4,618	-	-	-	4,618
Kern Delta Water District	2,412	-	-	-	2,412
Henry C. Garnett Treatment Plant:					
Improvement District No. 4	-	-	-	3,247	3,247
Unlined Losses - Pools 8					
Improvement District No. 4	475	-	-	-	475
Kern Delta Water District	241	-	-	-	241
Total	50,231	3,211	-	3,247	56,689
Existing Participant Deliveries	*28,281*	-	-	*3,247*	*31,528*
New Participant Deliveries	21,950	3,211	-	-	25,161
	50,231	3,211	-	3,247	56,689

Shading denotes forward flow deliveries based on each point of entry into the CVC; _/_ denotes pools / pump plants utilized (for forward flow).

Kern County Water Agency

Cross Valley Canal - Tupman Turnout Water Balance

State Water Project Deliveries

Month of December 2011

Subject to Adjustment

February 10, 2012
11:50 AM

	Reach 1				Reach 2											Reach 3				Extension					
	Pool 1	Pool 2			Pool 3					Pool 4			Pool 5		Pool 6			Pool 7				Pool 8		
Date	CVC Losses SWP	N-2 Siphon SWP	CVC Losses SWP	RRB 1 Turnout SWP	Strand Siphons SWP	North Strand Turnout SWP	South Strand Turnout SWP	KWB P-11 Turnout SWP	CVC Losses SWP	Nord Siphons SWP	Section 4 Pump SWP	CVC Losses SWP	RTO 1 Turnout SWP	CVC Losses SWP	RRB 2 Turnout SWP	RTO 2 Turnout SWP	CVC Losses SWP	AEWSD T.O. SWP	KTWD Siphons SWP	Unlined Losses SWP	RTO 3 River SWP	Unlined Losses SWP	RTO 4 Turnout SWP	Calloway Turnout SWP	Cawelo PSA SWP	T/O Total SWP
1	0	0	1	63	0	77	12	0	1	0	93	0	117	1	250	77	1	100	0	12	0	15	76	0	0	896
2	1	0	0	62	0	76	11	0	0	0	90	1	105	0	251	76	0	98	0	12	0	15	73	0	0	871
3	0	0	0	63	0	74	11	0	0	0	85	0	113	0	250	75	0	91	0	12	0	15	73	0	0	862
4	1	0	1	62	0	76	11	0	1	0	79	0	126	1	250	77	1	91	0	12	0	15	73	0	0	877
5	0	0	0	63	0	78	11	0	0	0	34	1	177	0	250	80	0	91	0	12	0	12	73	0	0	882
6	1	0	0	63	0	73	11	0	0	0	0	0	191	0	252	80	1	112	0	12	0	12	73	0	0	881
7	0	0	0	62	0	65	11	0	0	0	0	0	185	1	251	80	0	133	0	12	0	12	74	0	0	886
8	1	0	1	60	0	65	11	0	1	0	0	1	196	0	250	80	1	133	0	12	0	12	74	0	0	898
9	0	0	0	60	0	64	12	0	0	0	0	0	162	0	251	68	0	145	0	12	0	11	97	0	0	882
10	0	0	0	60	0	64	12	0	0	0	0	0	196	1	250	57	0	118	0	12	0	11	114	0	0	895
11	1	0	1	60	0	60	12	0	0	0	0	1	199	0	250	56	1	94	0	12	0	11	119	0	0	877
12	0	0	0	60	0	62	12	0	1	0	0	0	201	1	250	55	0	94	0	12	0	11	119	0	0	878
13	1	0	0	60	0	62	12	0	0	0	0	0	179	0	252	55	1	117	0	12	0	11	117	0	0	879
14	0	0	0	60	0	61	12	0	0	0	0	1	182	0	252	56	0	136	0	12	0	11	115	0	0	898
15	1	0	1	60	0	60	12	0	0	0	0	0	158	1	249	56	0	135	0	12	0	11	115	0	0	871
16	0	0	0	54	0	52	12	0	1	0	0	0	174	0	250	56	1	136	0	12	0	11	132	0	0	891
17	1	0	0	52	0	46	12	0	0	0	0	1	182	0	250	56	0	136	0	12	0	11	152	0	0	911
18	0	0	1	52	0	41	12	0	0	0	0	0	170	1	250	55	0	145	0	12	0	11	152	0	0	902
19	0	0	0	52	0	42	13	0	0	0	0	0	134	0	250	57	1	181	0	12	0	11	149	0	0	902
20	1	0	0	51	0	42	13	0	1	0	0	1	142	0	221	67	0	184	0	12	0	11	150	0	0	896
21	0	0	0	50	0	35	11	0	0	0	0	0	59	1	200	56	1	144	0	12	0	11	152	0	0	732
22	0	0	1	37	0	28	8	0	0	0	0	0	31	0	202	32	0	132	0	12	4	11	99	0	0	595
23	1	0	0	50	0	27	9	0	0	0	0	1	93	1	200	51	0	149	0	12	8	11	143	0	0	756
24	0	0	0	50	0	28	11	0	0	0	0	0	93	0	200	53	1	154	0	12	8	11	140	0	0	761
25	0	0	1	50	0	28	10	0	0	0	0	0	93	1	200	35	0	170	0	12	8	11	140	0	0	759
26	0	0	0	50	0	28	11	0	0	0	0	1	93	0	201	23	0	185	0	12	8	11	140	0	0	763
27	0	0	0	50	0	28	10	0	0	0	0	0	93	0	200	41	1	165	0	12	8	11	140	0	0	759
28	1	30	0	50	0	28	10	29	1	0	0	0	153	0	138	28	0	108	0	12	8	11	140	0	0	747
29	0	52	0	50	0	27	10	50	0	0	0	0	173	0	129	28	1	32	0	12	8	11	140	0	0	723
30	0	52	0	50	0	27	10	50	0	0	29	0	8	1	141	35	0	0	0	12	4	11	110	0	0	540
31	0	18	1	50	0	36	11	18	1	0	46	0	0	0	145	25	0	0	0	12	0	11	80	0	0	454
CFS	11	152	9	1,716	0	1,558	346	147	8	0	456	9	4,178	11	6,935	1,726	12	3,709	0	372	64	361	3,544	0	0	25,324
AF	22	302	18	3,404	0	3,090	686	292	16	0	905	18	8,287	22	13,755	3,423	24	7,357	0	737	127	716	7,030	0	0	50,231

	CVC Losses	N-2 Siphon	CVC Losses	RRB 1 Turnout	Strand Siphons	Strand Turnout	Strand Turnout	KWB P-11 Turnout	CVC Losses	Nord Siphons	Section 4 Pump	CVC Losses	RTO 1 Turnout	CVC Losses	RRB 2 Turnout	RTO 2 Turnout	CVC Losses	AEWSD T.O.	KTWD Siphons	Unlined Losses	RTO 3 River	Unlined Losses	RTO 4 Turnout	Calloway Turnout	Cawelo PSA	T/O Total
Arvin Edison WSD	8	0	7	643	0	0	0	0	6	0	0	8	0	10	12,967	0	14	5,482	0	0	0	0	0	0	0	19,145
Belridge WSD	0	0	0	0	0	0	0	0	0	0	85	0	978	0	0	703	0	0	0	0	0	0	0	0	0	1,766
Berrenda Mesa WD	1	0	0	0	0	0	0	0	0	0	85	1	495	1	0	1,720	1	0	0	0	0	0	0	0	0	2,304
Buena Vista WSD	0	0	0	0	0	32	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32
Improvement District No. 4	4	0	2	0	0	0	0	0	2	0	44	3	1,338	4	88	0	5	0	0	492	127	475	4,618	0	0	7,206
Kern Delta WD	6	0	6	2,761	0	3,058	686	0	5	0	0	3	0	4	700	0	4	1,875	0	245	0	241	2,412	0	0	12,006
Lost Hills WD	0	0	0	0	0	0	0	0	0	0	74	0	1,050	0	0	599	0	0	0	0	0	0	0	0	0	1,723
Rosedale Rio-Bravo WSD	1	0	1	0	0	0	0	0	1	0	534	1	1,018	0	0	373	0	0	0	0	0	0	0	0	0	1,930
Semitropic WSD	2	0	2	0	0	0	0	0	2	0	71	2	3,078	2	0	28	0	0	0	0	0	0	0	0	0	3,187
Tehachapi-Cummings CWD	0	302	0	0	0	0	0	292	0	0	0	0	301	0	0	0	0	0	0	0	0	0	0	0	0	895
Tejon Castaic WD	0	0	0	0	0	0	0	0	0	0	8	0	29	0	0	0	0	0	0	0	0	0	0	0	0	37
Total	22	302	18	3,404	0	3,090	686	292	16	0	905	18	8,287	22	13,755	3,423	24	7,357	0	737	127	716	7,030	0	0	50,231

NOTES:

[1] Arvin-Edison Water Storage District made deliveries of Metropolitan Water District State Water Project Table A supplies utilizing Lower-Tule River Irrigation District and Pixley Irrigation District capacities per a short-term agreement with North Kern WSD (per the Agreement for the Management of Conveyance Capacity in the Cross Valley Canal Capacity).

[2] Kern County Water Agency Member Units' made deliveries of State Water Project Table A supplies utilizing Kern-Tulare Water District capacities per long-term agreements which allow for KCWA M/U's to utilize unused capacities.

[3] Arvin-Edison WSD delivered a total of 620 af of AEWSD/MWD SWP supplies at Rosedale Turnout No. 2 as part of an operational exchange for 620 af of Arvin-Edison WSD Friant-Kern supplies delivered to the Arvin-Edison Intake Canal.

[4] Kern Delta Water District delivered a total of 206 af to Arvin-Edison WSD at Rosedale Turnout No. 2 as part of an operational exchange for 206 af of Arvin-Edison WSD Friant-Kern supplies at the Arvin-Edison Intake Canal off the Friant-Kern Canal.

[5] Kern Delta Water District delivered a total of 3,940 af of Metropolitan WD SWP supplies in December 2011.

[6] Kern Delta Water District delivered a total of 8,066 af of San Bernardino Valley Municipal Water District SWP supplies in December 2011.

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
02/13/2012	03/14/2012

INVOICE NO. 25085

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
561B-4402

Cross Valley Canal
December 2011

Estimated power costs for deliveries of Kern Delta Water District San Bernardino Valley Municipal Water District SWP supplies delivered to River Turnout No. 1, 2 and 4, Rosedale Rio-Bravo WSD and Arvin-Edison WSD; adjust for lined losses.

Canal Reach	Pumping Plant	SBVMWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	3,853	2.25	8,669.25
1	2	3,849	2.25	8,660.25
2	3	3,221	2.25	7,247.25
2	4	3,219	2.25	7,242.75
2	5	3,216	2.25	7,236.00
3	6	3,006	2.25	6,763.50
Extension	7	1,671	2.25	3,759.75

TOTAL AMOUNT DUE **$49,578.75**

Requested By	Prepared By	Approved By	Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
03/08/2012	04/09/2012

INVOICE NO. 25191

RECEIVED
MAR 1 2 2012

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1330(PWR)
561B-4402

Cross Valley Canal
January 2012

Estimated power costs for deliveries of Kern Delta Water District San Bernardino Valley Municipal Water District SWP supplies delivered to River Turnout No. 1, 2 and 4, Rosedale Rio-Bravo WSD and Arvin-Edison WSD; adjust for lined losses.

Canal Reach	Pumping Plant	SBVMWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	12,515	2.25	28,158.75
1	2	12,502	2.25	28,129.50
2	3	11,881	2.25	26,732.25
2	4	11,867	2.25	26,700.75
2	5	11,849	2.25	26,660.25
3	6	9,360	2.25	21,060.00
Extension	7	4,858	2.25	10,930.50

TOTAL AMOUNT DUE $168,372.00

VENDOR K0241
INVOICE # 25191
P.O. # DWR
DATE 3-8-12
AMOUNT 168372.00
ACCT. CODE 40540

PWR
40540
WATER B.P.

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Cross Valley Canal

January 2012 Deliveries - Gross AF

	Points of Entry				
	Tupman T/O SWP (AF)	Tupman T/O CVP (AF)	CVC / Friant-Kern Intertie KR (AF)	KCWA Armco Reverse SWP Exch. (AF)	CVC Total (AF)
Deliveries by Turnout:					
N-2 Siphon	-	-	-	-	-
Rosedale Rio Bravo Turnout No. 1	1,244	1,706	-	-	2,950
North Strand Ranch Turnout	282	-	-	-	282
South Strand Ranch Turnout	93	-	-	-	93
Kern Water Bank P-11 Turnout	-	-	-	-	-
Section 4 Turnout	121	659	-	-	780
River Turnout No. 1	-	1,759	-	-	1,759
Rosedale Rio Bravo Turnout No. 2	2,471	1,204	3,524	-	7,199
River Turnout No. 2	159	585	-	-	744
Arvin-Edison Turnout	3,612	55	-	-	3,667
Lined Losses - Pools 1-6	92	40	6	-	138
River Turnout No. 3 to River	-	-	-	-	-
Unlined Losses - Pool 7	890	-	-	-	890
River Turnout No. 4 to River	4,092	-	-	-	4,092
Henry C. Garnett Treatment Plant	-	-	-	3,374	3,374
Unlined Losses - Pool 8	766	-	-	-	766
Total	13,822	6,008	3,530	3,374	26,734
Deliveries by Turnout/Participant:					
Rosedale-Rio Bravo Turnout No. 1					
Arvin-Edison WSD	-	1,398	-	-	1,398
Kern Delta Water District	610	-	-	-	610
Kern-Tulare Water District	-	308	-	-	308
Rosedale-Rio Bravo WSD	634	-	-	-	634
Nouth Strand Turnout					
Rosedale-Rio Bravo WSD	282	-	-	-	282
South Strand Turnout					
Rosedale-Rio Bravo WSD	93	-	-	-	93
Section 4 Turnout					
Belridge WSD	-	227	-	-	227
Berrenda Mesa WD	-	214	-	-	214
Lost Hills WD	-	218	-	-	218
Rosedale-Rio Bravo WSD	121	-	-	-	121
River Turnout No. 1					
Belridge WSD	-	608	-	-	608
Berrenda Mesa WD	-	568	-	-	568
Lost Hills WD	-	583	-	-	583
Rosedale Rio Bravo Turnout No. 2					
Arvin-Edison WSD	-	932	2,225	-	3,157
Kern Delta Water District	2,471	-	-	-	2,471
Kern-Tulare Water District	-	272	1,299	-	1,571
River Turnout No. 2					
Belridge WSD	159	204	-	-	363
Berrenda Mesa WD	-	190	-	-	190
Lost Hills WD	-	191	-	-	191
Arvin-Edison Turnout					
Arvin-Edison WSD	-	55	-	-	55
Kern Delta Water District	3,612	-	-	-	3,612
Lined Losses - Pools 1-6					
Arvin-Edison WSD	-	15	4	-	19
Belridge WSD	-	9	-	-	9
Berrenda Mesa WD	-	8	-	-	8
Kern Delta Water District	89	-	-	-	89
Kern-Tulare Water District	-	-	2	-	2
Lost Hills WD	-	8	-	-	8
Rosedale-Rio Bravo WSD	3	-	-	-	3
Unlined Losses - Pools 7					
Kern Delta Water District	890	-	-	-	890
River Turnout No. 4					
Kern Delta Water District	4,092	-	-	-	4,092
Henry C. Garnett Treatment Plant:					
Improvement District No. 4	-	-	-	3,374	3,374
Unlined Losses - Pools 8					
Kern Delta Water District	766	-	-	-	766
Total	13,822	6,008	3,530	3,374	26,734
Existing Participant Deliveries	*1,133*	*2,980*	*3,530*	*3,374*	*8,006*
New Participant Deliveries	12,689	3,028	-	-	18,728
	13,822	6,008	3,530	3,374	26,734

Shading denotes forward flow deliveries based on each point of entry into the CVC; _ / _ denotes pools / pump plants utilized (for forward flow).

Kern County Water Agency
Cross Valley Canal - Tupman Turnout Water Balance
State Water Project Deliveries
Month of January 2012
Subject to Adjustment

March 8, 2012
10:29 AM

	Reach 1				Reach 2											Reach 3				Extension						
	Pool 1	Pool 2	Pool 3							Pool 4		Pool 5			Pool 6			Pool 7		Pool 8					
Date	CVC Losses SWP	N-2 Siphon SWP	CVC Losses SWP	RRB 1 Turnout SWP	Strand Siphons SWP	North Strand Turnout SWP	South Strand Turnout SWP	KWB P-11 Turnout SWP	CVC Losses SWP	Nord Siphons SWP	Section 4 Pump SWP	CVC Losses SWP	RTO 1 Turnout SWP	CVC Losses SWP	RRB 2 Turnout SWP	RTO 2 Turnout SWP	CVC Losses SWP	AEWSD T.O. SWP	KTWD Siphons SWP	Unlined Losses SWP	RTO 3 River SWP	Unlined Losses SWP	RTO 4 Turnout SWP	Calloway Turnout SWP	Cawelo PSA SWP	T/O Total SWP
1	0	0	0	50	0	32	10	0	0	0	13	1	0	0	104	20	0	0	0	14	0	12	80	0	0	336
2	1	0	0	50	0	32	10	0	1	0	13	0	0	1	65	20	0	0	0	15	0	13	81	0	0	302
3	0	0	0	50	0	32	12	0	0	0	13	0	0	0	65	20	1	0	0	14	0	12	80	0	0	299
4	0	0	1	50	0	32	11	0	0	0	13	0	0	0	64	20	0	0	0	15	0	13	80	0	0	299
5	0	0	0	50	0	14	4	0	0	0	9	0	0	1	53	0	0	0	0	14	0	12	81	0	0	238
6	1	0	0	52	0	0	0	0	0	0	0	0	0	0	46	0	0	27	0	15	0	13	80	0	0	234
7	0	0	0	49	0	0	0	0	0	0	0	1	0	0	41	0	0	21	0	14	0	12	80	0	0	218
8	1	0	0	50	0	0	0	0	0	0	0	0	0	1	39	0	0	0	0	15	0	13	80	0	0	199
9	0	0	0	50	0	0	0	0	1	0	0	0	0	0	57	0	0	0	0	14	0	12	83	0	0	217
10	0	0	0	22	0	0	0	0	0	0	0	0	0	0	87	0	1	0	0	15	0	13	81	0	0	219
11	0	0	1	0	0	0	0	0	0	0	0	0	0	0	108	0	0	0	0	14	0	12	81	0	0	216
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	0	0	0	0	15	0	13	82	0	0	235
13	1	0	0	0	0	0	0	0	1	0	0	1	0	1	18	0	0	0	0	14	0	12	65	0	0	113
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	0	15	0	13	59	0	0	144
15	1	0	1	0	0	0	0	0	0	0	0	0	0	0	30	0	1	101	0	14	0	12	56	0	0	216
16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	30	0	0	104	0	15	0	13	57	0	0	220
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	1	102	0	14	0	12	56	0	0	215
18	0	0	1	0	0	0	0	0	0	0	0	0	0	0	30	0	0	104	0	15	0	13	60	0	0	223
19	0	0	0	0	0	0	0	0	0	0	0	1	0	0	14	0	0	116	0	14	0	12	57	0	0	214
20	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	127	0	15	0	13	57	0	0	215
21	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11	0	0	120	0	14	0	12	57	0	0	215
22	0	0	0	0	0	0	0	0	0	0	0	1	0	0	40	0	0	90	0	15	0	13	58	0	0	217
23	0	0	0	23	0	0	0	0	1	0	0	0	0	1	40	0	0	72	0	14	0	12	57	0	0	220
24	0	0	0	40	0	0	0	0	0	0	0	0	0	0	40	0	1	49	0	15	0	13	57	0	0	215
25	1	0	1	40	0	0	0	0	0	0	0	0	0	0	40	0	0	49	0	14	0	12	58	0	0	215
26	0	0	0	40	0	0	0	0	0	0	0	0	0	1	40	0	0	93	0	15	0	13	57	0	0	259
27	0	0	0	11	0	0	0	0	0	0	0	0	0	0	29	0	1	89	0	14	0	12	57	0	0	213
28	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	95	0	15	0	13	58	0	0	183
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	127	0	14	0	12	56	0	0	210
30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	135	0	15	0	12	56	0	0	219
31	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	143	0	14	0	12	56	0	0	230
CFS	8	0	7	627	0	142	47	0	6	0	61	7	0	9	1,246	80	9	1,821	0	449	0	386	2,063	0	0	6,968
AF	16	0	14	1,244	0	282	93	0	12	0	121	14	0	18	2,471	159	18	3,612	0	890	0	766	4,092	0	0	13,822
Berrenda Mesa WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159	0	0	0	0	0	0	0	0	0	159
Kern Delta WD	15	0	13	610	0	0	0	0	11	0	0	14	0	18	2,471	0	18	3,612	0	890	0	766	4,092	0	0	12,630
Rosedale Rio-Bravo WSD	1	0	1	634	0	282	93	0	1	0	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,133
Total	16	0	14	1,244	0	282	93	0	12	0	121	14	0	18	2,471	159	18	3,612	0	890	0	766	4,092	0	0	13,822

NOTES:
[1] As part of an operational exchange, Kern Delta WD delivered San Bernardino Valley Municipal Water District SWP supplies to Arvin-Edison WSD at Rosedale Turnout No. 1 and 2 (total of 1,655 af) in exchange for Arvin-Edison WSD Friant-Kern supplies delivered to Kern Delta at the Arvin-Edison Intake Canal (1,655 af).
[2] As part of an operational exchange, Kern Delta WD delivered San Bernardino Valley Municipal Water District SWP supplies to Kern-Tulare WD at Rosedale Turnout No. 1 and 2 (total of 1,426 af) in exchange for Kern-Tulare WD Friant-Kern supplies delivered to Kern Delta at the Arvin-Edison Intake Canal (1,426 af).

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
03/08/2012	04/09/2012

INVOICE NO. 25193

RECEIVED
MAR 12 2012
0055-1100
580B-4430

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

Cross Valley Canal
January 2012

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of San Bernardino Valley MWD State Water Project supplies to Arvin-Edison WSD and River Turnout No. 4 as well as operational exchange deliveries to Rosedale Turnout No. 1 and 2; adjusted for lined losses.

Reach	SBVMWD SWP Volume AF	Total $/AF [1]	Conveyance Costs Total $
1	12,530	1.00	12,530.00
2	11,881	1.00	11,881.00
3	9,378	1.00	9,378.00
		Total Amount Due	33,789.00

TOTAL AMOUNT DUE $ 33,789.00

[1] Conveyance Fee $1.00 per Reach.

DR 40540

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
05/01/2012	05/31/2012

INVOICE NO. 25328

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1310
561B-4402

Cross Valley Canal
February 2012

Estimated power costs for deliveries of Kern Delta Water District San Bernardino Valley Municipal Water District SWP supplies delivered to River Turnout No. 4 and Arvin-Edison WSD; adjust for lined losses.

Canal Reach	Pumping Plant	SBVMWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	6,496	2.25	14,616.00
1	2	6,478	2.25	14,575.50
2	3	6,458	2.25	14,530.50
2	4	6,438	2.25	14,485.50
2	5	6,414	2.25	14,431.50
3	6	6,386	2.25	14,368.50
Extension	7	1,273	2.25	2,864.25

TOTAL AMOUNT DUE **$89,871.75**

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
05/01/2012	05/31/2012

INVOICE NO. 25331

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0055-1100
580B-4430

Cross Valley Canal
February 2012

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of San Bernardino Valley MWD State Water Project supplies to Arvin-Edison WSD and River Turnout No. 4; adjusted for lined and unlined losses.

Reach	SBVMWD SWP Volume AF	Total $/AF [1]	Conveyance Costs Total $
1	6,536	1.00	6,536.00
2	6,478	1.00	6,478.00
3	6,414	1.00	6,414.00
		Total Amount Due	19,428.00

TOTAL AMOUNT DUE **$ 19,428.00**

[1] Conveyance Fee $1.00 per Reach.

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
05/29/2012	06/28/2012

INVOICE NO. 25429

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0053-1310
561B-4402

Cross Valley Canal
March 2012

Estimated power costs for deliveries of Kern County Water District Member Units' groundwater via an operational exchange with Kern Delta Water District San Bernardino Valley Municipal Water District SWP supplies on the California Aqueduct, delivered to the Arvin-Edison WSD Turnout; adjust for lined losses.

Canal Reach	Pumping Plant	SBVMWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	0	2.25	0.00
1	2	0	2.25	0.00
2	3	0	2.25	0.00
2	4	2,850	2.25	6,412.50
2	5	2,821	2.25	6,347.25
3	6	2,787	2.25	6,270.75
Extension	7	0	2.25	0.00

TOTAL AMOUNT DUE **$19,030.50**

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

May 29, 2012

Mr. Mark Mulkay
Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

Re: Estimated power and conveyance invoices for March 2012; Cross Valley Canal Water Balance Summaries for March 2012

Dear Mr. Mulkay:

Enclosed are the above referenced documents for your records and remittance. If you have any questions or require further information, please call me at (661) 634-1491.

Sincerely,

Trent Taylor
Water Resources Planner
Kern County Water Agency

Enclosures

(661) 634-1400

Mailing Address
P.O. Box 58
Bakersfield, CA 93302-0058

Street Address
3200 Rio Mirada Dr.
Bakersfield, CA 93308

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
05/29/2012	06/28/2012

INVOICE NO. 25445

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307

0055-1310
580B-4430

Cross Valley Canal
March 2012

Early implementation conveyance fees in the Cross Valley Canal for delivery of Kern Delta Water District deliveries of San Bernardino Valley MWD State Water Project supplies, delivered via an operational exchange with Kern County Water Agency Member Units' groundwater supplies, to the Arvin-Edison WSD Turnout; adjusted for lined.

Reach	SBVMWD SWP Volume AF	Total $/AF [1]	Conveyance Costs Total $
1		1.00	-
2	2,868	1.00	2,868.00
3	2,821	1.00	2,821.00
		Total Amount Due	5,689.00

TOTAL AMOUNT DUE **$ 5,689.00**

[1] Conveyance Fee $1.00 per Reach.

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Cross Valley Canal

March 2012 Deliveries - Gross AF

	Points of Entry				
	Tupman T/O Groundwater (AF)	Tupman T/O CVP (AF)	CVC / Friant-Kern Intertie KR (AF)	KCWA Armco Reverse SWP Exch. (AF)	CVC Total (AF)
Deliveries by Turnout:					
Reverse - Calif. Aqueduct	7,085	-	-	-	7,085
Rosedale Rio Bravo Turnout No. 1	-	-	-	-	-
North Strand Ranch Turnout	-	-	-	-	-
South Strand Ranch Turnout	-	-	-	-	-
Kern Water Bank P-11 Turnout	-	-	-	-	-
Section 4 Turnout	-	-	-	-	-
River Turnout No. 1	-	-	-	-	-
Rosedale Rio Bravo Turnout No. 2	-	-	-	-	-
River Turnout No. 2	-	-	-	-	-
Arvin-Edison Turnout	3,027	-	-	-	3,027
CVC / FK Intertie	526	-	-	-	526
Lined Losses - Pools 1-6	275	-	-	-	275
River Turnout No. 3 to River	-	-	-	-	-
Unlined Losses - Pool 7	156	-	-	-	156
River Turnout No. 4 to River	-	-	-	-	-
Henry C. Garnett Treatment Plant	135	-	-	2,983	3,118
Unlined Losses - Pool 8	162	-	-	-	162
Total	11,366	-	-	2,983	14,349
Deliveries by Turnout/Participant:					
Reverse - Calif. Aqueduct					
Belridge WSD	791	-	-	-	791
Berrenda Mesa WD	1,096	-	-	-	1,096
Dudley Ridge WD	762	-	-	-	762
Lost Hills WD	985	-	-	-	985
Semitropic WSD	282	-	-	-	282
Westside Mutual WC	890	-	-	-	890
Wheeler Ridge Maricopa WSD	2,279	-	-	-	2,279
Arvin-Edison Turnout					
Kern Delta Water District	2,787 GS	-	-	-	2,787
Kern Tulare WD / ID4 / AEWSD Exch.	240 GS	-	-	-	240
CVC / FK Intertie					
Kern Tulare Water District	526 GS	-	-	-	526
Lined Losses - Pools 1-6					
Belridge WSD	19	-	-	-	19
Berrenda Mesa WD	31	-	-	-	31
Dudley Ridge WD	7	-	-	-	7
Improvement District No. 4	18	-	-	-	18
Kern Delta Water District	81	-	-	-	81
Kern-Tulare Water District	35	-	-	-	35
Lost Hills WD	25	-	-	-	25
Semitropic WSD	3	-	-	-	3
Westside Mutual WC	9	-	-	-	9
Wheeler Ridge Maricopa WSD	47	-	-	-	47
Unlined Losses - Pools 7					
Improvement District No. 4	156 /7/6	-	-	-	156
Henry C. Garnett Treatment Plant:					
Improvement District No. 4	135 /GT/	-	-	2,983	3,118
Unlined Losses - Pools 8					
Improvement District No. 4	162 /8/7/	-	-	-	162
Total	11,366	-	-	2,983	14,349
Existing Participant Deliveries	*1,272*	-	-	*2,983*	*5,945*
New Participant Deliveries	10,094	-	-	-	8,404
	11,366	-	-	2,983	14,349

Shading denotes forward flow deliveries based on each point of entry into the CVC: _ / _ denotes pools / pump plants utilized (for forward flow).

Invoice

Rosedale-Rio Bravo Water Storage District

PO Box 20820
Bakersfield, CA 93390-0820

Phone # 661-589-6045
Fax # 661-589-1867

Date	Invoice #
4/13/2012	1018

Bill To

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307-6247

Terms
Net 30

Description	Amount
Pioneer Wheeling Charges - December 2011	17,090.00

DWR
40130
4/20/12

Please remit to above address.

Total $17,090.00

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
02/15/12	03/16/12

INVOICE NO. 25112

0102-1310	0
0075-1310	17,090
761B-4430	8,737
761B-4401	6,145
741A-4499	307
761B-4402	1,901
020A-4430	0

Rosedale-Rio Bravo WSD
PO Box 867
Bakersfield, CA 93302-0867

Pioneer Project
Estimated Billing
December 2011

December 2011:
SWP to Pioneer

Transportation via Section 4 Pump (RRB)	418 af	@	0.00 $/af	0
Transportation via Section 4 Pump (KCWA)	41 af	@	8.75 $/af	359
Transportation via Section 4 Pump (KT)	75 af	@	8.75 $/af	656
Transportation via Section 4 Pump (PG&E)	534 af	@	3.56 $/af	1,901
Transportation via RTO 1 (RRB):	796 af	@	0.00 $/af	0
Transportation via RTO 1 (Agency):	79 af	@	11.00 $/af	869
Transportation via RTO 1 (KT):	143 af	@	11.00 $/af	1,573
Transportation via RTO 2 (RRB):	292 af	@	0.00 $/af	0
Transportation via RTO 2 (Agency):	28 af	@	14.25 $/af	399
Transportation via RTO 2 (KT):	53 af	@	14.25 $/af	755
Transportation via River Channel	47 af	@	0.00 $/af	0
Transportation via 2800 Acres:	649 af	@	5.36 $/af	3,479
Transportation via Basins 1, 9 & 10:	695 af	@	0.93 $/af	646
O&M:	1,229 af	@	5.00 $/af	6,145
Facility Replacement:	1,229 af	@	0.25 $/af	307
Subtotal				$ 17,090

TOTAL AMOUNT DUE/(REFUNDED) **$17,090**

1,925 AF DELIVERED.

PASS THRU TO KDWD

Pd 3-13-12 ck# 7422

Requested By | Prepared By | Approved By | Approved By

☐ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Invoice

Rosedale-Rio Bravo Water Storage District

PO Box 20820
Bakersfield, CA 93390-0820

Phone # 661-589-6045
FAX # 661-589-1867

Date	Invoice #
4/13/2012	1016

Bill To

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307-6247

Terms
Net 30

Description	Amount
Pioneer Wheeling Charges - November 2011	11,198.88

DWR
40130
4/20/12

Please remit to above address.

Total $11,198.88

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
01/25/12	02/24/12

INVOICE NO. 25032

0102-1310	0
0075-1310	14,787
761B-4430	2,314
761B-4401	6,690
741A-4499	335
761B-4402	5,448
020A-4430	0

Rosedale-Rio Bravo WSD
PO Box 867
Bakersfield, CA 93302-0867

Pioneer Project
Estimated Billing
November 2011

November 2011:
SWP to Pioneer

Transportation via Section 4 Pump (RRB)	1,065 af	@	0.00 $/af	0
Transportation via Section 4 Pump (KCWA)	54 af	@	8.75 $/af	473
Transportation via Section 4 Pump (KT)	74 af	@	8.75 $/af	648
Transportation via Section 4 Pump (PG&E)	1,193 af	@	2.84 $/af	3,388
Transportation via RTO 1 (RRB):	252 af	@	0.00 $/af	0
Transportation via RTO 1 (Agency):	13 af	@	11.00 $/af	143
Transportation via RTO 1 (KT):	17 af	@	11.00 $/af	187
Transportation via River Channel	1 af	@	0.00 $/af	0
Transportation via 2800 Acres:	136 af	@	5.36 $/af	729
Transportation via Basins 1, 9 & 10:	145 af	@	0.93 $/af	135
O&M:	1,338 af	@	5.00 $/af	6,690
Facility Replacement:	1,338 af	@	0.25 $/af	335
Subtotal				$ 12,726

Additional Charges:

Transportation via Section 4 Pump (April 2011 - PG&E	1,392 af	@	1.48 $/af	$ 2,060

TOTAL AMOUNT DUE/(REFUNDED) **$14,787**

1,475 AF DELIVERED

AEWSD 12% = $1,527.12
KDWD 88% = $11,198.88

Pd 2/14/12
ck# 7370

Requested By	Prepared By	Approved By	Approved By

☐ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Invoice

Rosedale-Rio Bravo Water
Storage District

PO Box 20820
Bakersfield, CA 93390-0820

Phone # 661-589-6045
Fax # 661-589-1867

Date	Invoice #
4/13/2012	1013

Bill To

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307-6247

Terms
Net 30

Description	Amount
Cross Valley Canal Pumping Costs - September 2011 Pumping Plant No. 1 - $1761.50 Pumping Plant No. 2 - $1761.50 Pumping Plant No. 3 - $747.50 Pumping Plant No. 4 - $747.50 Pumping Plant No. 5 - $1150.00	6,168.00

DWR
40540
4/20/12

Please remit to above address.

Total $6,168.00

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

CROSS VALLEY CANAL PUMPING COSTS

KERN DELTA WATER DISTRICT - SEPTEMBER 2011

Deliveries and Pumping Plant Usage			
Description	Volume (AF)	Rate ($/AF)	Pumping Cost ($)
Pumping Plant No. 1	542	3.25	1,761.50
Pumping Plant No. 2	542	3.25	1,761.50
Pumping Plant No. 3	230	3.25	747.50
Pumping Plant No. 4	230	3.25	747.50
Pumping Plant No. 5	230	5.00	1,150.00
		TOTAL >	**6,168.00**

Delivery Accounting	
Turnout	AF
Rosedale No. 1 (West)	312
Strand Ranch	0
Rosedale No. 2 (East)	230
CVC Losses	0
TOTAL >	**542**

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
12/12/2011	01/11/2012

INVOICE NO. 24801

Rosedale-Rio Bravo WSD
PO Box 20820
Bakersfield, CA 93390-0820

0053-1330(PWR)
561B-4402

Cross Valley Canal
September 2011

Estimated power costs for deliveries of Rosedale Rio-Bravo WSD SWP Table A supplies as well as Arvin-Edison WSD and Kern Delta WD use of RRBWSD capacity to convey Metropolitan WD SWP supplies to Rosedale Turnout No. 1 and 2; adjusted for lined losses.

Canal Reach	Pumping Plant	RRBWSD SWP Volume AF	AEWSD SWP Volume AF	KDWD SWP Total AF	Rate $/AF	Pumping Costs $
1	1	4,009	1,608	542	3.25	20,016.75
1	2	4,008	1,608	542	3.25	20,013.50
2	3	837	0	230	3.25	3,467.75
2	4	0	0	230	3.25	747.50
2	5	0	0	230	5.00	1,150.00
3	6	0	0	0	5.00	0.00
Extension	7	0	0	0	5.00	0.00

TOTAL AMOUNT DUE **$45,395.50**

Requested By	Prepared By	Approved By	Approved By

☑ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Invoice

Rosedale-Rio Bravo Water Storage District

PO Box 20820
Bakersfield, CA 93390-0820

Phone # 661-589-6045
Fax # 661-589-1867

Date	Invoice #
4/13/2012	1014

Bill To

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307-6247

Terms
Net 30

Description	Amount
Cross Valley Canal Pumping Costs - November 2011 Pumping Plant No. 1 - $8258.25 Pumping Plant No. 2 - $8255.00 Pumping Plant No. 3 - $263.25 Pumping Plant No. 4 - $169.00 Pumping Plant No. 5 - $260.00	17,205.50

DWR
40540
4/20/12

Please remit to above address.

Total $17,205.50

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

CROSS VALLEY CANAL PUMPING COSTS

KERN DELTA WATER DISTRICT - OCTOBER 2011

Deliveries and Pumping Plant Usage			
Description	Volume (AF)	Rate ($/AF)	Pumping Cost ($)
Pumping Plant No. 1	2,541	3.25	8,258.25
Pumping Plant No. 2	2,540	3.25	8,255.00
Pumping Plant No. 3	81	3.25	263.25
Pumping Plant No. 4	52	3.25	169.00
Pumping Plant No. 5	52	5.00	260.00
		TOTAL >	**17,205.50**

Delivery Accounting	
Turnout	AF
Rosedale No. 1 (West)	1,373
Strand Ranch	1,116
Rosedale No. 2 (East)	52
CVC Losses	0
TOTAL >	**2,541**

✓

AMOUNT OF WATER RECLASSIFIED AS KDWD.

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
01/06/2012	02/06/2012

INVOICE NO. 24922

Rosedale-Rio Bravo WSD
PO Box 20820
Bakersfield, CA 93390-0820

0053-1330(PWR)
561B-4402

Cross Valley Canal
October 2011

Estimated power costs for deliveries of Rosedale Rio-Bravo WSD SWP Table A supplies to Rosedale Turnout No. 1 and 2 as well as refill deliveries per the Refill/Dewatering Policy Guidelines; adjusted for lined losses.

Canal Reach	Pumping Plant	RRBWSD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	2,919	3.25	9,486.75
1	2	2,918	3.25	9,483.50
2	3	81	3.25	263.25
2	4	52	3.25	169.00
2	5	52	5.00	260.00
3	6	0	5.00	0.00
Extension	7	0	5.00	0.00

TOTAL AMOUNT DUE **$19,662.50**

Requested By	Prepared By	Approved By	Approved By
☑ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL			

Invoice

Rosedale-Rio Bravo Water
Storage District

PO Box 20820
Bakersfield, CA 93390-0820

Phone # 661-589-6045
Fax # 661-589-1867

Date	Invoice #
4/13/2012	1015

Bill To

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307-6247

Terms
Net 30

Description	Amount
Cross Valley Canal Power Costs - November 2011	27,101.25

DWR
40540
4/20/12

Please remit to above address.

Total $27,101.25

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

CROSS VALLEY CANAL PUMPING COSTS

KERN DELTA WATER DISTRICT - NOVEMBER 2011

Deliveries and Pumping Plant Usage			
Description	Volume (AF)	Rate ($/AF)	Pumping Cost ($)
Pumping Plant No. 1	5,326	2.25	11,983.50
Pumping Plant No. 2	5,324	2.25	11,979.00
Pumping Plant No. 3	0	2.25	0.00
Pumping Plant No. 4	0	2.25	0.00
Pumping Plant No. 5	0	2.25	0.00
		SUB-TOTAL >	**23,962.50**

Delivery Accounting	
Turnout	AF
Rosedale No. 1 (West)	1,845
Strand Ranch	3,481
Rosedale No. 2 (East)	0
CVC Losses	0
TOTAL >	**5,326**

✓

Pumping Plant Usage[1]			
Description	Volume (AF)	Rate ($/AF)	Pumping Cost ($)
Pumping Plant No. 1	0	2.25	0.00
Pumping Plant No. 2	0	2.25	0.00
Pumping Plant No. 3	1,230	2.25	2,767.50
Pumping Plant No. 4	165	2.25	371.25
Pumping Plant No. 5	0	2.25	0.00
		SUB-TOTAL >	**3,138.75**

TOTAL > **27,101.25**

[1] CVC Power cost to move RRB water to Pioneer. KDWD agreed to move this water to Pioneer to free capacity in RRB spreading areas.

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
01/18/2012	02/17/2012

INVOICE NO. 25017

Rosedale-Rio Bravo WSD
PO Box 20820
Bakersfield, CA 93390-0820

0053-1330(PWR)
561B-4402

Cross Valley Canal
November 2011

Estimated power costs for deliveries of Rosedale Rio-Bravo WSD SWP Table A supplies to the Pioneer Project utilizing the Section 4 Turnout and River Turnout No. 1. Deliveries of Kern Delta WD at Rosedale Turnout No. 1 and 2 and the North and South Turnouts were made with Kern Delta WD MWD supplies; adjusted for lined losses.

Canal Reach	Pumping Plant	RRBWSD SWP Volume AF	KDWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	1,318	5,326	2.25	14,949.00
1	2	1,318	5,324	2.25	14,944.50
2	3	1,318	0	2.25	2,965.50
2	4	252	0	2.25	567.00
2	5	0	0	2.25	0.00
3	6	0	0	2.25	0.00
Extension	7	0	0	2.25	0.00

TOTAL AMOUNT DUE **$33,426.00**

Requested By	Prepared By	Approved By	Approved By

☑ ORIGINAL ☐ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Invoice

Rosedale-Rio Bravo Water Storage District

PO Box 20820
Bakersfield, CA 93390-0820

Phone # 661-589-6045
Fax # 661-589-1867

Date	Invoice #
4/13/2012	1017

Bill To

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307-6247

Terms
Net 30

Description	Amount
Cross Valley Canal Pumping Costs - December 2011	50,436.00

DWR
40540
4/20/12

Please remit to above address.

Total $50,436.00

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT
CROSS VALLEY CANAL PUMPING COSTS
KERN DELTA WATER DISTRICT - DECEMBER 2011

Deliveries and Pumping Plant Usage			
Description	Volume (AF)	Rate ($/AF)	Pumping Cost ($)
Pumping Plant No. 1	5,873	2.25	13,214.25
Pumping Plant No. 2	5,872	2.25	13,212.00
Pumping Plant No. 3	4,056	2.25	9,126.00
Pumping Plant No. 4	354	2.25	796.50
Pumping Plant No. 5	353	2.25	794.25
		SUB-TOTAL >	**37,143.00**

Delivery Accounting	
Turnout	AF
Rosedale No. 1 (West)	2,761
Strand Ranch	2,759
Rosedale No. 2 (East)	353
CVC Losses	0
TOTAL >	**5,873**

Pumping Plant Usage[1]			
Description	Volume (AF)	Rate ($/AF)	Pumping Cost ($)
Pumping Plant No. 1	1,510	2.25	3,397.50
Pumping Plant No. 2	1,509	2.25	3,395.25
Pumping Plant No. 3	1,508	2.25	3,393.00
Pumping Plant No. 4	1,089	2.25	2,450.25
Pumping Plant No. 5	292	2.25	657.00
		SUB-TOTAL >	**13,293.00**

TOTAL > **50,436.00**

[1] CVC Power cost to move RRB water to Pioneer. KDWD agreed to move this water to Pioneer to free capacity in RRB spreading areas.

KERN COUNTY WATER AGENCY
P.O. BOX 58
BAKERSFIELD, CA 93302-0058
PHONE: 661/634-1400 FAX: 661/634-1428

INVOICE DATE	DUE DATE
02/13/2012	03/14/2012

INVOICE NO. 25082

Rosedale-Rio Bravo WSD
PO Box 20820
Bakersfield, CA 93390-0820

0053-1330(PWR)
561B-4402

Cross Valley Canal
December 2011

Estimated power costs for deliveries of Rosedale Rio-Bravo WSD SWP Table A supplies to the Pioneer Project utilizing the Section 4 Turnout and River Turnout No. 1. Deliveries of Kern Delta WD at Rosedale Turnout No. 1 and 2 and the North and South Turnouts were made with Kern Delta WD MWD and SBVMWD supplies; adjusted for lined losses.

Canal Reach	Pumping Plant	RRBWSD SWP Volume AF	KDWD MWD SWP Volume AF	KDWD SBVMWD SWP Volume AF	Rate $/AF	Pumping Costs $
1	1	1,510	3,940	1,933	2.25	16,611.75
1	2	1,509	3,939	1,933	2.25	16,607.25
2	3	1,508	3,937	119	2.25	12,519.00
2	4	1,089	236	118	2.25	3,246.75
2	5	292	236	117	2.25	1,451.25
3	6	0	0	0	2.25	0.00
Extension	7	0	0	0	2.25	0.00

TOTAL AMOUNT DUE **$50,436.00**

Requested By	Prepared By	Approved By	Approved By

☐ ORIGINAL ☑ REMITTANCE ☐ FILE ☐ ACCOUNTING ☐ NUMERICAL CONTROL

Invoice

Rosedale-Rio Bravo Water Storage District
PO Box 20820
Bakersfield, CA 93390-0820

Phone # 661-589-6045
Fax # 661-589-1867

Date	Invoice #
12/5/2011	1009

RECEIVED
DEC - 6 2011

Bill To

Kern Delta Water District
501 Taft Highway
Bakersfield, CA 93307-6247

Terms
Net 30

Description	Amount
CVC Pumping Costs August 2011 see attached statement	4,959.50

DWR
40540

VENDOR	Ro400
INVOICE #	1009
P.O. #	DWR
DATE	12-5-11
AMOUNT	4959.50
ACCT. CODE	40540

12/14/11

Please remit to above address.

Total $4,959.50

WATER B.P.

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

CROSS VALLEY CANAL PUMPING COSTS

KERN DELTA WATER DISTRICT - AUGUST 2011

Deliveries and Pumping Plant Usage			
Description	Volume (AF)	Rate ($/AF)	Pumping Cost ($)
Pumping Plant No. 1	763	3.25	2,479.75
Pumping Plant No. 2	763	3.25	2,479.75
Pumping Plant No. 3	0	3.25	0.00
Pumping Plant No. 4	0	3.25	0.00
Pumping Plant No. 5	0	3.25	0.00
		TOTAL >	**4,959.50**

Delivery Accounting	
Turnout	AF
Rosedale No. 1 (West)	763
Strand Ranch	0
Rosedale No. 2 (East)	0
CVC Losses	0
TOTAL >	**763**

RECEIVED
DEC 19 2011

Invoice

Buena Vista Water Storage District
P.O. Box 756
Buttonwillow, CA 93206

Telephone: 661-324-1101

Invoice No.	2669
Customer No.	0780

Bill To	Ship To
Kern Delta Water District 501 Taft Highway Bakersfield, CA 93307 USA	Kern Delta Water District 501 Taft Highway Bakersfield, CA 93307 USA

Invoice Date	Order Date	SO Number	Ordered By	Customer PO Number	Payment Method
12/16/2011	12/1/2011				Net 30 Days

Warehouse	Ship Via	F.O.B.	Salesperson	Resale Number
MAIN				

Order Quantity	Ship Quantity	Tax	Item Number / Description	Unit Price	Extended Price
25,000.00	25,000.00	N	KDEX Kern Delta Exchange 2011 EXHANGE FEES PURSUANT TO MEMO OF UNDERSTANDING - THIS EXCHANGE IS IN ADDITION TO THE ANNUAL LONG-TERM WATER EXCHANGE AGREEMENT NO. 2 Exchange in place of cvc cost.	15.50	387,500.00

DWR
~~3110~~
30110

VENDOR Bo300
INVOICE # 2669
P.O. # DWR
DATE 12-16-11
AMOUNT 387,500.00
ACCT. CODE

1/9/12

MET

Print Date	12/16/11	**Total Paid**	0.00	**Subtotal**	387,500.00
Print Time	10:29:05 AM	**Balance Due**	387,500.00	**Freight**	0.00
Page No.	1	**Due Date**	01/15/12	**Invoice Total**	387,500.00

Printed By: Marinelle

1/4/12

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:

SAN BERNARDINO VALLEY WATER
CONSERVATION DISTRICT
1630 West Redlands Boulevard, Suite A
Redlands, CA 92373-8032
Attention: General Manager

SPACE ABOVE THIS LINE FOR RECORDER'S USE

EXEMPT GOVERNMENT AGENCY Per Government Code Sec. 6103

By_____
District Secretary, San Bernardino Valley Water Conservation District

AGREEMENT TO DEVELOP AND OPERATE ENHANCED RECHARGE FACILITIES

This Agreement to Develop and Operate Enhanced Recharge Facilities ("**Agreement**") is entered into and effective this 1st day of October, 2012 by and among the San Bernardino Valley Water Conservation District (the "**Conservation District**"), the San Bernardino Valley Municipal Water District ("**Valley District**") and Western Municipal Water District of Riverside County ("**Western**"). The Conservation District, Valley District and Western are each sometimes referred to as a "**Party**" and are collectively sometimes referred to as the "**Parties.**"

Recitals

A. General Purposes.

(1) The Parties each hold water rights to the waters of the Santa Ana River and each own and operate facilities that serve to divert and/or store the waters of the Santa Ana River. Furthermore, each Party possesses critical assets and unique skills that the other Parties do not possess.

(2) The Parties wish to collaboratively use all of their respective assets and skills, including but not limited to water rights and facilities necessary or useful for the diversion and storage of water, to improve the reliability of local water supplies for their respective constituents by establishing a collaborative partnership to coordinate the use of their separate resources for mutual advantage.

(3) The Parties specifically wish to collaborate by increasing opportunities to recharge local surface water supplies, as well as State Project Water, in the San Bernardino Basin Area (the "**SBBA**"); by reducing the time and cost required to permit and construct essential public infrastructure (such as spreading basins); and by working together to achieve an efficient division of labor in the operation and maintenance of water infrastructure.

(4.) The Parties acknowledge that their water resource management activities in the Santa Ana River wash area proceed in concert with other uses of the lands in that area, including the mining of sand and gravel mineral deposits pursuant to existing leases, and habitat conservation and management, pursuant to a series of multi-agency cooperative initiatives involving local, state, and federal resource management and control agencies. The Parties' goal is to harmonize their water resource activities with these other uses, for the optimization of coordinated use by all.

(5) The Parties wish to memorialize their joint understandings by means of this Agreement.

B. Findings.

(1) The Parties agree that they must increase groundwater storage in the SBBA in order to meet current and future demands for water among their constituents.

(2) In the past, reasonable disagreements among the Parties have added unintentional and undesirable costs and complexity to the planning and permitting of important water resources projects in the region.

(3) The Parties believe that it is in their best interests, and the best interest of the public they serve, to cooperate in increasing the available water supply by establishing a new and more productive working relationship.

(4) In certain years, wet weather conditions and increased availability of State Project Water can create a limited opportunity to improve the reliability of local water supplies by increasing recharge and storage to groundwater. These favorable conditions are temporary and perishable. Therefore, time is of the essence. New inter-agency operating agreements should be established immediately in order to make the most of this and future opportunities because they occur on an irregular and unpredictable basis.

(5) Because of the limited and sporadic opportunities to augment local water supplies, the Parties intend for this Agreement to continue for a long period, thereby allowing the utilization of such limited water supplies.

Agreements

1. *Term.* The term of this Agreement shall commence on the Effective Date first written above and shall continue for a term of twenty five (25) years ("Initial Term") , unless terminated earlier as provided in this Agreement. This Agreement may be extended by written agreement among all parties for up to five additional, consecutive five year terms ("Extension Terms"), on the same terms and conditions stated herein, provided that prior to the expiration of the term then in effect, all parties agree in writing to the applicable extension, by action of their legislative bodies, to extend the Agreement for another term.

2. *Duties of the Conservation District.*

a. *Lease of Facilities for the Purpose of Groundwater Recharge to Valley District and Western.* The Conservation District hereby leases to Valley District and Western, for the term of this Agreement and on the terms specified herein, the surface of the lands shown on Exhibit 1 during the term of this Agreement ("**Leased Property**"). Exhibit 1A provides the legal description for the lands owned in fee by the Conservation District and Exhibit 1B provides the legal description of lands made available under existing easements under ownership by the Bureau of Land Management. Exhibit 1 is attached hereto and incorporated herein by reference. Valley District and Western shall have the right to enter upon and use the Leased Property, and any reasonably necessary subsurface areas incident thereto. Such entry and use shall be only for the purpose of recharging, storing or conveying water from any source (collectively "**recharging of water**" herein) into or through the percolation basins and other facilities owned or controlled by the Conservation District, whether existing as of the effective date of this Agreement, or as may be constructed pursuant to the terms of this Agreement, as such existing and contemplated future facilities are depicted in Exhibit 2, which is attached hereto and incorporated herein by reference). The Conservation District reserves all rights in and to the Leased Property not expressly conveyed as a part of this lease. Specific terms of this lease are as follows:

(1) Valley District and Western may construct, operate, maintain, repair, reconstruct and rehabilitate diversion facilities, recharge basins, pumps and other ancillary facilities or equipment located within the Leased Property as Valley District and Western may reasonably deem necessary for the recharging of water on the Leased Property,

recognizing that the Parties intend that the Conservation District shall be responsible for the operation and maintenance of such facilities.

(2) Included within this lease are all rights of reasonable ingress and egress as may be useful or necessary, in Valley District and/or Western's sole discretion, for the purpose of the recharging of water on the Leased Property, provided that such activities shall not interfere with: (i) any conservation easements that may now exist, or may be established consistent with the Conservation District's Upper Santa Ana River Wash Land Management and Habitat Conservation Plan, on said lands, or (ii) other easements existing as of the effective date of this Agreement.

(3) The designs for any such facilities or other tenant improvements must be approved, in advance by the Conservation District, which approval shall not be unreasonably withheld or delayed, and are subject to any limitations on the Conservation's District's holding of the Leased Property. The Conservation District shall cooperate reasonably with Valley District and Western to obtain local, state, or federal permits that may be required to construct or operate such facilities approved by the Conservation District.

(4) The Conservation District will utilize its best efforts under all existing and future lease agreements and easements with other individuals, organizations or entities operating on the Leased Property to harmonize the objective of Valley District and Western making full use of the facilities on the Leased Property for the recharge of water, consistent with the hydrological design limitations of these facilities, with any competing uses of the properties on which such facilities are or may be located.

(5) The Parties recognize that the Conservation District has negotiated lease agreements with mining companies that allow the Conservation District to engage in recharge of water that may periodically interfere with or prevent mining, without liability on the part of the Conservation District, which agreements are attached hereto as Exhibits 3 and 4. The Conservation District represents and warrants that these are the only current agreements that authorize mining on the Leased Property, and represents and warrants that the copies of these agreements attached as Exhibits 3 and 4 are true and correct copies of those agreements. Based on those representations, the Parties believe that they can collaboratively manage the recharge of water to avoid liability arising from any incompatibility between the recharging of water and any

activities otherwise authorized under the mining leases. Toward this end, the Parties agree as follows:

(a) During the winter season (from October 1 to March 31), the Parties will consult with each other on a regular basis to determine the quantity of water that may be recharged without interfering with mining operations.

(b) In the event that the recharging of water threatens to substantially limit or interfere with mining operations, the Parties shall immediately confer to determine how to maximize the recharge without unduly interfering with mining activity. Towards this end, the parties acknowledge that the Conservation District has the right, from time to time and as it deems necessary in the exercise of its reasonable discretion, to utilize all or any portion of the areas subject to the mining leases for its water recharge, conservation, spreading, and other operations, provided such activities are undertaken utilizing best efforts to avoid storing water so as to require temporary use of the mining lease areas. In connection with the exercise of their activities on the Leased Property hereunder, Valley District and Western shall assist the Conservation District to make every effort to minimize the time of any interruption of the mining lessees' activities on the Leased Property, to permit sufficient time for the Conservation District to observe all requirements for notice to mining lessees required under the applicable leases in the event of conflicts, and to harmonize their recharge of water with the then-current and anticipated immediate future excavation and other activities of the mining lessees, with the overall goal that the mining activity and the water conservation activity can harmoniously exist, without interruption to either.

(c) Any decisions about the proper scope, location, or amount of recharging of water after such consultation with appropriate agencies shall be made solely by the Conservation District in the exercise of its reasonable discretion, consistent with paragraph 4(d)(2) below, and consistent with the principle of ensuring that the optimum quantity of water possible is replenished within the San Bernardino Basin Area.

In the event the Conservation District determines, in the exercise of its reasonable discretion, that portions of the Leased Property cannot be made available to Valley District and Western, and such determination is made at a time when water supplies are otherwise

immediately available to Valley District and Western for recharge into facilities on the leased land:, Conservation District will not object, directly or indirectly, to efforts by Valley District and/or Western to deliver water supplies that cannot be spread on the Leased Property to other locations, *provided that* in determining where to deliver such water supplies, Valley District and Western act consistent with the priority of first delivering water for direct delivery or spreading within the SBBA, then delivering water for direct delivery or spreading within the boundaries of Valley District, then delivering water for direct delivery, spreading or storage within Western, and then delivering water for direct delivery, spreading or storage outside of Western.

In such event, the parties shall meet and confer in good faith, under the auspices of the Joint Operations Committee provided for in paragraph 4(b) below, regarding whether some proportional refund to Valley District, Western, or both of a portion the gross lease fee paid for the given year in which the Leased Premises were unavailable for the recharge of water may be appropriate, and if so, in what amount.

b. *Operation and Maintenance of Spreading Basins.* The Conservation District shall operate and maintain all new and existing facilities, located on the areas depicted in Exhibit 2 hereto, in good working condition, to ensure that the recharge of water continues efficiently, in accordance with a mutually-agreed schedule of regular maintenance and any supplemental agreements governing special or emergency maintenance responsibilities. The Conservation District shall set aside a portion of the gross lease fee provided for in Paragraph 3(a) below received from Valley and Western, in accordance with the Conservation District's Reserve Policy, to ensure sufficient funds are available to meet the agreed maintenance obligations.

c. *Ownership of New Facilities* Upon expiration or other proper termination of this Agreement, however, improvements made on land owned or controlled by the Conservation District shall become Conservation District property, to be used by the Conservation District for water management and the recharge of water.

d. *Groundwater Charge*. All parties producing water in the Conservation District's jurisdictional boundaries shall be subject to all then-applicable groundwater charges, and this Agreement shall not exempt nor excuse any party, including Valley District and Western, from the levy or payment thereof. Notwithstanding, the parties recognize that they do not intend that groundwater charges would be required to be paid on production of water pursuant to measures taken for the emergency alleviation of high groundwater conditions, or the implementation of

other basin management objectives as may be approved by the Basin Technical Advisory Commission ("**BTAC**") or other similar organization including all of the parties hereto that may perform a substantially similar role under any Conjunctive Use Plan that may be implemented for the SBBA. The Conservation District agrees to consider implementing reasonable measures to reduce or eliminate groundwater charges for groundwater production devoted to such agreed purposes, whether by exemption, or refund of charges otherwise paid, as may be consistent with applicable law.

3. *Duties of Valley District and Western.*

a. *Gross Lease Fee.* Valley District and Western shall together pay to the Conservation District a gross lease fee of $350,000/year for the right to the recharge of water through the existing percolation basins and other facilities owned by the Conservation District, and the right to construct and have operated additional recharge and conveyance facilities on the Leased Property. The parties acknowledge and affirm that the gross lease fee is a lease payment for access to and use of the Leased Property, only, and for partial offset to the costs of operation and maintenance of facilities thereon same by the Conservation District. The gross lease fee does not include, and is not intended to replace or offset, any charges for the acquisition, conveyance, storage, or production of water, that may otherwise apply by or among the parties, or third parties, whether now or in the future.

b. Valley District and Western, or either of them, shall pay the gross lease fee, in advance, by October 1st of each year, which sum may be apportioned by the Conservation District to its Groundwater Enterprise and other funds.

(1) Valley District and Western shall annually adjust the gross lease fee to account for inflation using the U.S. Bureau of Labor Statistics Consumer Price Index (CPI-U) for the Los Angeles District. The base year for such payments will be 2012.

(2) In the event that Valley District and/or Western construct new percolation basins or other facilities useful or necessary for the recharge of water, the Parties shall adjust the gross lease fee proportionally to reflect the additional operation and maintenance costs that will be incurred by the Conservation District in operating and maintaining those new facilities, as may be agreeable to the Parties.

c. *Permitting for New or Augmented Spreading Basins.* Valley District and Western shall be responsible for obtaining all federal, state and local permits (including conducting environmental review under the California Environmental Quality Act or the National Environmental Policy Act) that may be required to construct

additional facilities for the recharge of water supplied by Valley and Western. If, after 10 years, Valley and Western have been unable to obtain the necessary permits, either or both may terminate this lease agreement subject to the provisions of paragraph 9.c. below. Valley District and Western shall bear all costs associated with protecting, repairing or replacing the material infrastructure improvements (including pipelines, gates, valves, weirs, fencing, gauges, etc.) installed by Valley District and Western on lands owed by the Conservation District.

d. *Resource Management.*

(1) Valley District and Western shall coordinate their operations to harmonize with mineral resource extractions, to avoid any potential liability under mineral leases, or other uses authorized by the Conservation District on the Leased Property.

(2) Valley District and Western shall negotiate supplemental payments to the Conservation District where unusual and unforeseen circumstances necessitate extraordinary maintenance expenses that are in excess of the budget prepared and approved by the Joint Operations Committee.

(3) Valley District and Western shall cooperate with the Conservation District in developing a long-term resource management plan to govern multiple-use activities in Reach 5 of the Santa Ana River wash (i.e., the Upper Santa Ana River Wash Land Management and Habitat Conservation Plan).

4. *Duties of All Parties*

a. *No Rights to Other Party(ies)' Water or Facilities.* Except as provided for in paragraph 2(c) above, the Conservation District will not assert any claim to own or control the new facilities constructed, or the additional water recharged by, Valley District and Western under the terms of this Agreement, provided that these activities occur in conformance with this Agreement. Valley District and Western will not assert any claim to own or control any water that is percolated in the new or existing recharge basins that is not supplied by Valley District or Western, nor make any attempt to acquire or control land or facilities owned by the Conservation District.. Valley District and Western acknowledge and represent to Conservation District that this Agreement provides for and constitutes "compatible use" of the Conservation District's property and facilities, as that term is utilized in California Code of Civil Procedure sections 1240.510 et seq., thereby eliminating any need for any exercise of eminent domain by any party to acquire any additional interest in the Leased Property from any other party.

b. *Establishment of Joint Operations Committee.* The Parties shall establish and participate in a Joint Operations Committee (the "**JOC**") to serve in an advisory capacity to the Conservation District, which shall assist the Conservation District to develop a schedule and budget for planned operation and maintenance activities relating to the recharge of water on the Leased Property, and perform other functions as otherwise specified herein, under such rules and procedures as it shall formulate and unanimously approve. The JOC shall meet at least twice a year to plan water recharge, review financial and water accounting matters implicated hereunder, and review performance.

c. *Joint Reporting.* The Parties shall jointly provide planning documents, monitoring reports, and other records that may be requested by authorized agencies to demonstrate compliance with federal, state or local laws and regulations. Specifically, the Parties shall continue to cooperate in the preparation and submission of annual reports to the California State Water Resources Control Board, which reports will follow the format used by the Parties in reporting the use of water for calendar year 2010. A copy of the report filed with the California State Water Resources Control Board is attached hereto as Exhibit 5 and incorporated herein by reference.

d. *Water Resources Management.*

(1) The Parties will continue to coordinate all recharge of water with one another to protect and enhance the safe yield in the SBBA. Specifically, the Parties will: (i) jointly develop the Regional Conjunctive Use Plan (or its equivalent) through the Basin Technical Advisory Committee, (ii) seek additional opportunities to increase safe yield in the SBBA by engaging in cooperative joint development of new water supply projects or conservation programs in the region, and (iii) cooperate with one another to document the water resource management benefits accrued by establishing and implementing this Agreement.

(2) The parties agree to dedicate and use the water made available pursuant to their respective water rights in and to the Santa Ana River to give priority to preserving the safe yield of the SBBA, as part of the reasonable and prudent management of their entire portfolio of water resources. All parties shall refrain from contesting any water rights claimed or held by one another at any time during the term of this Agreement, so long as such water rights are exercised in the manner consistent with this Agreement.

(3) The Parties will not export native water from the SBBA, or recharge water on behalf of agencies located outside the SBBA, except as

provided for by the 1969 *Western* Judgment and/or by the Regional Conjunctive Use Plan (or its equivalent).

5. *Amendments.* The Parties will negotiate amendments, including but not limited to areal expansion of the scope of activities, to this Agreement in good faith and not unreasonably withhold consent.

6. *Liberal Construction.* The Parties shall construe all terms and conditions in this Agreement in a manner which most favors increasing available water supplies by encouraging greater recharge of water in the area.

7. *Indemnification*

a. *Generally.* Each Party shall indemnify, defend and hold harmless the other Parties, their directors, officers, employees and agents from and against all damages, liabilities, claims, actions, demands, costs and expenses (including, but not limited to, costs of investigations, lawsuits and any other proceedings whether in law or in equity, settlement costs, attorneys' fees and costs), and penalties or violations of any kind, which arise out of, result from, or are related to a Party's performance of its obligations under this Agreement. In extending such indemnification, however, no party hereto waives any sovereign or governmental immunities, privileges, or rights that they may have or enjoy under any applicable law, including but not limited to California Government Code sections 810 et seq., and except as otherwise specifically provided for hereunder, and each party reserves all such immunities, privileges and rights , and any claims or other procedures applicable to same, that may presently exist or hereafter be created, to themselves, as against each of the other parties, and as against any third party.

b. *Indemnification Procedures.* Any Party that is an indemnified party (the "**Indemnified Party**") that has a claim for indemnification against the other Party (the "**Indemnifying Party**") under this Agreement, shall promptly notify the Indemnifying Party in writing, specifying the nature of the claim, the grounds upon which the Indemnified Party believes the Indemnifying Party is liable in whole or in part for the liability or other obligation asserted under the claim, and including any appropriate demand for defense or indemnification, or both. No delay on the part of the Indemnified Party in notifying the Indemnifying Party shall relieve the Indemnifying Party from any obligation unless (and then solely to the extent) the Indemnifying Party is prejudiced. Further, the Indemnified Party shall promptly notify the Indemnifying Party of the existence of any claim, demand, or other matter to which the indemnification obligations apply, and shall give the Indemnifying Party a reasonable opportunity to defend the same at its own expense and with counsel of its own selection, *provided* that the Indemnified Party shall at all times also have the right to fully participate in the disputed matter at its own expense. If the Indemnifying Party refuses to provide the

indemnity, or within a reasonable time after written notice from the Indemnified Party, fails to defend a claim, demand or other matter to which the indemnification obligations apply, the Indemnified Party shall have the right, but not the obligation, to undertake the defense of, and to compromise or settle (exercising reasonable business judgment), the claim or other matter, on behalf, or for the account, and at the risk, of the Indemnifying Party. If the claim is one that cannot by its nature be defended solely by the Indemnifying Party, then the Indemnified Party shall make available all information and assistance to the Indemnifying Party that the Indemnifying Party may reasonably request. In the event of any dispute between the Indemnified party and the Indemnifying Party as to whether the claim is one to which the indemnification obligations apply, the matter shall be resolved in the manner of resolution of disputes, as provided in paragraph 9 hereunder. Except as specifically provided otherwise in Paragraph 9(b) (4) below with respect to tolling of limitations periods, the notice provided for hereunder shall be in addition to, and not in place of, any other notice that may be provided for or otherwise required under law.

8. *Force Majeure.* In addition to any other specific provisions of this Agreement, a Party hereto shall not be deemed to be in default under this Agreement where failure or delay in performance of any of such Party's obligations under this Agreement is caused by floods, earthquakes, winds, other Acts of God, power outages, equipment failure, acts of vandalism, fires or other casualties, wars, riots or similar hostilities, strikes and other labor difficulties beyond the Party's control, (including the Party's employment force), enactment of new or conflicting, laws or regulations, including any new listing of endangered species or designation of critical habitat for endangered species, court actions (such as restraining orders or injunctions), judicial actions such as issuance of restraining orders and injunctions, or other causes beyond such Party's control. If any one or more of such events occur, the term of this Agreement and the time for performance by any Party of any of its obligations hereunder shall be extended by the period of time that such one or more events prevented or delayed such performance, provided that the term of this Agreement shall not be extended under any circumstances for more than five (5) years. In the event that said period of time must be extended by more than five years, this Agreement shall automatically terminate.

9. *Administration of Agreement*

a. *Books and Records.* Each Party shall have access to and the right to examine any of the other Party's pertinent books, documents, papers or other records (including, without limitation, records contained on electronic media) relating to the performance of that Party's obligations pursuant to this Agreement. Each Party shall retain all such books, documents, papers or other records to facilitate such review in accordance with that Party's record retention policy. Access to each Party's books and records shall be during normal business hours only.

Nothing in this paragraph shall be construed to operate as a waiver of any applicable privileges.

b. *Disputes.* The Parties recognize that there may be disputes regarding the obligations of the Parties or the interpretation of this Agreement. The Parties agree that they may attempt to resolve disputes as follows:

(1) *Statement Describing Alleged Violation of Agreement.* A Party or Parties alleging a violation of this Agreement (the "**Initiating Party(ies)**") shall provide a written statement describing all facts that it believes constitute a violation of this Agreement to the Party(ies) alleged to have violated the terms of this Agreement (the "**Responding Party(ies)**").

(2) *Response to Statement of Alleged Violation.* The Responding Party(ies) shall have sixty days from the date of the written statement to prepare a written response to the allegation of a violation of this Agreement and serve that response on the Initiating Party(ies) or to cure the alleged violation to the reasonable satisfaction of the Initiating Party(ies). The Initiating Party(ies) and the Responding Party(ies) shall then meet within thirty days of the date of the response to attempt to resolve the dispute amicably.

(3) *Mediation of Dispute.* If the Initiating Party(ies) and the Responding Party(ies) cannot resolve the dispute within ninety days of the date of the written response, they shall engage a mediator, experienced in water-related disputes, to attempt to resolve the dispute. Each Party shall ensure that it is represented at the mediation by a Director or Councilperson. These representatives of the Initiating Party(ies) and the Responding Party(ies) may consult with staff and/or technical consultants during the mediation and such staff and/or technical consultants may be present during the mediation. The costs of the mediator shall be divided evenly between the Initiating Party(ies) and the Responding Party(ies).

(4) *Prior to Claims Under California Tort Claims Act.* The Parties agree that the procedure described in this paragraph represents an effort to resolve disputes without the need for a formal claim under the California Tort Claims Act or other applicable law. The period of time for the presentation of a claim by one Party against another shall be tolled for the period from the date on which the Initiating Party(ies) file a written statement until the date upon which the mediator renders a decision.

(5) *Reservation of Rights.* Nothing in this paragraph shall require a Party to comply with a decision of the mediator and, after the completion of the mediation process described above, each Party shall retain and may exercise at any time all legal and equitable rights and remedies it may have to enforce the terms of this Agreement; provided, that prior to commencing litigation, a Party shall provide at least five calendar days' written notice of its intent to sue to all Parties.

c. *Termination of Agreement*

(1) *Failure to Obtain Permits.* The Parties recognize and acknowledge that the implementation of this Agreement may require one or more Parties to obtain permits or other regulatory approvals from one or more local, state or federal regulatory agencies, including but not limited to the Regional Water Quality Control Board, the California Department of Fish & Game and the U.S. Fish & Wildlife Service or the U.S. Army Corps of Engineers. Because of the significant regulatory uncertainties associated with obtaining these permits or regulatory approvals, the Parties agree that, if Valley District and Western have not received all regulatory permits or approvals required or useful for groundwater replenishment on the Leased Property within ten years from the effective date of this Agreement, Valley District and/or Western may terminate this Agreement at any time by providing the Conservation District with one-year's written notice of such termination. In the event that Valley District or Western, but not both wish to terminate this Agreement, the Party wishing to terminate this Agreement shall be allowed to terminate the Agreement as to itself and the remaining two Parties may continue the Agreement on such terms as they deem to be equitable.

(2) *Material Breach.* If one Party deems that another Party has materially breached one of the provisions of this Agreement, the Parties shall use the dispute resolution procedures set forth in paragraph 9. b. above in an effort to resolve the dispute amicably. If, the dispute resolution process described in paragraph 9. b. above is not successful in resolving the dispute, any Party may terminate this Agreement for material breach thereof, and may seek any remedy that it would otherwise be entitled to in a court of law.

d. *Recordation of Agreement.* All Parties agree that this Agreement constitutes a lease of certain lands by the Conservation District to Valley District and Western for the purpose of constructing, operating, maintaining, repairing and rehabilitating percolation basins and ancillary facilities on the Leased Property, and consequently, all Parties agree that this Agreement should be recorded in the

Official Records of the County of San Bernardino. Valley District shall, within ten days of the effective date of this Agreement, cause this agreement to be recorded in the Official Records of the County of San Bernardino and shall promptly provide the Conservation District and Western with recorded copies of this Agreement upon receipt of such copies from the County of San Bernardino.

10. *General Provisions.*

a. *Authority.* Each signatory of this Agreement represents that s/he is authorized to execute this Agreement on behalf of the Party for which s/he signs. Each Party represents that it has legal authority to enter into this Agreement and to perform all obligations under this Agreement.

b. *Amendment.* This Agreement may be amended or modified only by a written instrument executed by each of the Parties to this Agreement.

c. *Jurisdiction and Venue.* This Agreement shall be governed by and construed in accordance with the laws of the State of California, except for its conflicts of law rules. Any suit, action, or proceeding brought under the scope of this Agreement shall be brought and maintained to the extent allowed by law in the County of San Bernardino, California.

d. *Headings.* The paragraph headings used in this Agreement are intended for convenience only and shall not be used in interpreting this Agreement or in determining any of the rights or obligations of the Parties to this Agreement.

e. *Construction and Interpretation.* This Agreement has been arrived at through negotiations and each Party has had a full and fair opportunity to revise the terms of this Agreement. As a result, the normal rule of construction that any ambiguities are to be resolved against the drafting Party shall not apply in the construction or interpretation of this Agreement.

f. *Entire Agreement.* This Agreement constitutes the entire agreement of the Parties with respect to the subject matter of this Agreement and, save as expressly provided in this Agreement, supersedes any prior oral or written agreement, understanding, or representation relating to the subject matter of this Agreement.

g. *Partial Invalidity.* If, after the date of execution of this Agreement, any provision of this Agreement is held to be illegal, invalid, or unenforceable under present or future laws effective during the term of this Agreement, such provision shall be fully severable. However, in lieu thereof, there shall be added a provision as similar in terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

h. *Successors and Assigns*. This Agreement shall be binding on and inure to the benefit of the successors and assigns of the respective Parties to this Agreement. No Party may assign its interests in or obligations under this Agreement without the written consent of the other Parties, which consent shall not be unreasonably withheld or delayed.

i. *Waivers*. Waiver of any breach or default hereunder shall not constitute a continuing waiver or a waiver of any subsequent breach either of the same or of another provision of this Agreement and forbearance to enforce one or more of the rights or remedies provided in this Agreement shall not be deemed to be a waiver of that right or remedy.

j. *Attorneys' Fees and Costs*. The prevailing Party in any litigation or other action to enforce or interpret this Agreement shall be entitled to reasonable attorneys' fees, expert witnesses' fees, costs of suit, and other and necessary disbursements in addition to any other relief deemed appropriate by a court of competent jurisdiction.

k. *Necessary Actions*. Each Party agrees to execute and deliver additional documents and instruments and to take any additional actions as may be reasonably required to carry out the purposes of this Agreement.

l. *Compliance with Law*. In performing their respective obligations under this Agreement, the Parties shall comply with and conform to all applicable laws, rules, regulations and ordinances.

m. *Third Party Beneficiaries*. This Agreement shall not create any right or interest in any non-Party or in any member of the public as a third party beneficiary.

n. *Counterparts*. This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which together shall constitute but one and the same instrument.

o. *Notices*. All notices, requests, demands or other communications required or permitted under this Agreement shall be in writing unless provided otherwise in this Agreement and shall be deemed to have been duly given and received on: (i) the date of service if served personally or served by facsimile transmission on the Party to whom notice is to be given at the address(es) provided below, (ii) on the first day after mailing, if mailed by Federal Express, U.S. Express Mail, or other similar overnight courier service, postage prepaid, and addressed as provided below, or (iii) on the third day after mailing if mailed to the Party to whom notice is to be given by first class mail, registered or certified, postage prepaid

572 **Table of Exhibits**

573 Exhibit 1 Leased Property including Exhibit 1A and 1B

574 Exhibit 2 Existing and Future Facilities

575 Exhibit 3 CEMEX Lease

576 Exhibit 4 Robertson's Ready Mix Lease

577 Exhibit 5 2010 State Water Rights Filing

WESTERN MUNICIPAL WATER DISTRICT
"Western"

Donald D. Galleano
President
Board of Directors

Approved as to form only:

Jeff Ferre
Best, Best & Krieger

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT
"Valley District"

C. Patrick Milligan
President
Board of Directors

Approved as to form only:

David R.E. Aladjem
Special District Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT
"Conservation District"

Richard W. Corneille
President
Board of Directors

Approved as to form only:

David B. Cosgrove
General Counsel

State of California)
County of Riverside)

On Dec 19, 2012, before me, Teresa VAN Scyoc,
(insert name and title of the officer)
Notary Public, personally appeared Donald D. GALLEANO,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Teresa Van Scyoc (Seal)

State of California)
County of San Bernardino)

On Dec. 12, 2012, before me, M. Galvez, Notary Public,
(insert name and title of the officer)
Notary Public, personally appeared Richard W. Corneille and no one else,
who proved to me on the basis of satisfactory evidence to be the person~~(s)~~ whose name~~(s)~~ ~~(is/are~~ subscribed to the within instrument and acknowledged to me that ~~he/she/they~~ executed the same in ~~his/her/the~~ir authorized capacity~~(ies),~~ and that by ~~his/her/their~~ signature~~(s)~~ on the instrument the person~~(s)~~, or the entity upon behalf of which the person~~(s)~~ acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (Seal)

M. GALVEZ
COMM. # 1870870
NOTARY PUBLIC - CALIFORNIA
SAN BERNARDINO COUNTY
MY COMM. EXP. DEC. 6, 2013

State of California)
County of San Bernardino)

On Dec. 12, 2012, before me, L. Jaramillo, Notary Public
(insert name and title of the officer)
Notary Public, personally appeared C. Patrick Milligan,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(~~s~~) on the instrument the person(~~s~~), or the entity upon behalf of which the person(~~s~~) acted, executed the instrument.

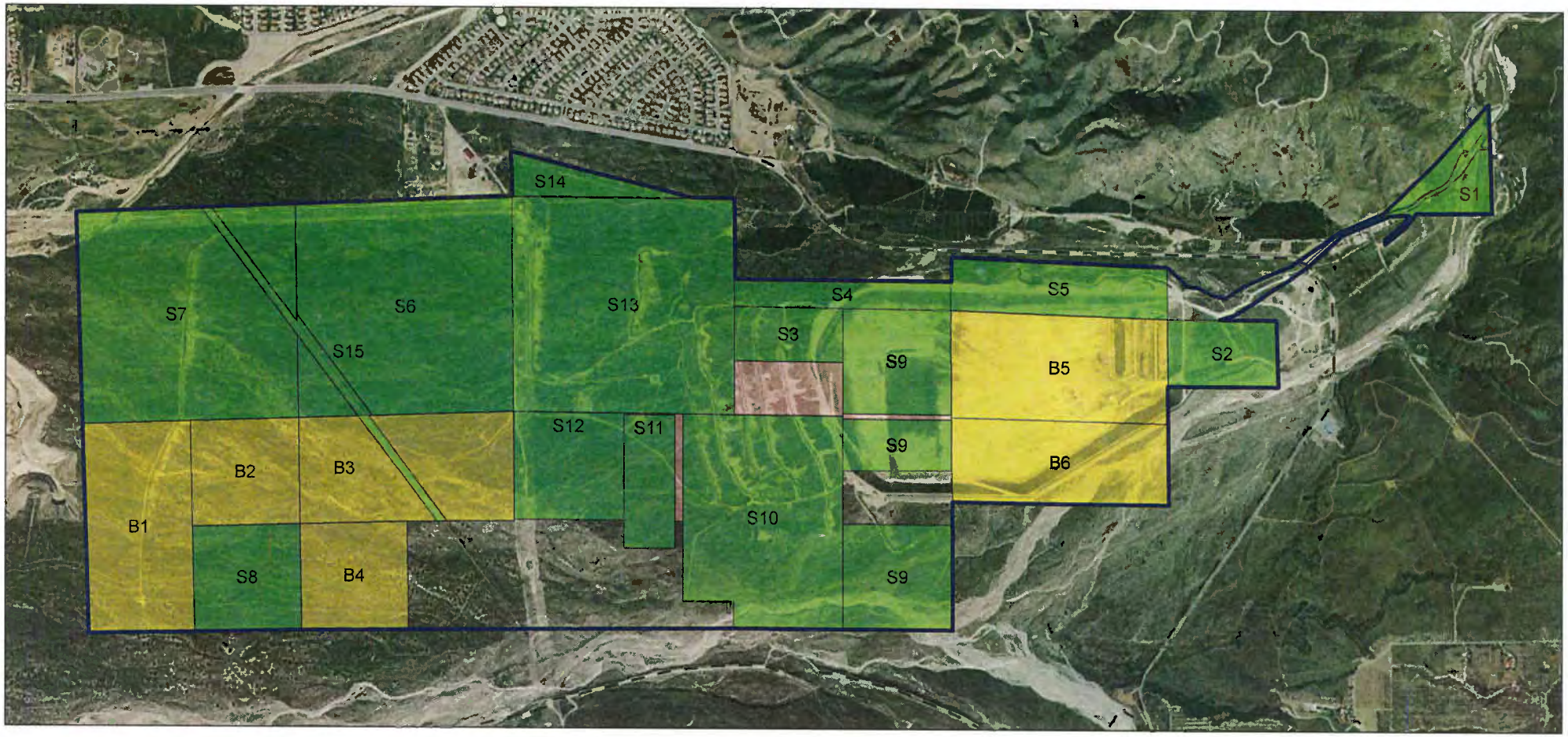
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

L. JARAMILLO
Commission # 1974864
Notary Public - California
San Bernardino County
My Comm. Expires May 10, 2016

Signature L. Jaramillo (Seal)

EXHIBIT 1



- - - - Wash Plan Area Boundary
SAR Recharge Area (1485 Acres)
SBVWCD Lands (952 Acres)
BLM Property Access (513 Acres)
Other Ownership Limited Access

Exhibit 1

N
W E
S

0 950 1,900 3,800
Feet

C. Brudin
14 Sept 2012
M:\2011 Projects\Land Ownership District_Exhibit1_Edits.mxd

SBV WATER CONSERVATION DISTRICT
OUR NAME IS OUR MISSION

EXHIBIT 1A
LEGAL DESCRIPTION
SBVWCD LANDS

THOSE PORTIONS OF SECTIONS 4, 6, 7 AND 8, TOWNSHIP 1 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN AND THOSE PORTIONS OF SECTION 12, TOWNSHIP 1 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF HIGHLAND, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, DESCRIBED AS FOLLOWS:

PARCEL S1: (A.P. NO. 0297-041-07)
THAT PORTION OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 4, SAID PORTION LYING SOUTHEASTERLY OF THE FOLLOWING DESCRIBED LINE:

BEGINNING AT THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER; THENCE SOUTHWESTERLY TO THE SOUTHWEST CORNER OF SAID SECTION 4.

PARCEL S2: (A.P. NO. 0297-061-01)
THE NORTH HALF OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 8.

PARCEL S3: (A.P. NO. 0297-051-06)
THE NORTH HALF OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 7, COMPRISING 20 ACRES, MORE OR LESS.

PARCEL S4: (A.P. NO. 0297-051-05)
THE SOUTH 20 ACRES OF THE NORTH OF THE NORTHEAST QUARTER OF SAID SECTION 7.

PARCEL S5: (A.P. NO. 0297-061-03)
THE SOUTH HALF OF THE NORTH HALF OF THE NORTHWEST QUARTER OF SAID SECTION 8, COMPRISING 40 ACRES, MORE OR LESS.

PARCEL S6: (A.P. NO. 0291-151-02)
THE NORTHEAST QUARTER OF SAID SECTION 12, EXCEPT RAILROAD RIGHT-OF-WAY AND EXCEPT STATION AT APLIN AND COMPRISING 157 ACRES, MORE OR LESS.

PARCEL S7: (A.P. NO. 0291-151-01)
THE NORTHWEST QUARTER OF SAID SECTION 12, EXCEPT RAILROAD RIGH-OF-WAY.

PARCEL S8: (A.P. NO. 0291-161-04)
THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 12.

PARCEL S9: (A.P. NO. 0297-051-07, 0297-051-08, 0297-051-09, 0297-051-10, 0297-071-09, 0297-071-10, 0297-071-13, 0297-071-14, 0297-071-16, 0297-071-17)
LOTS 1 THROUGH 6 AND LOTS 9 THROUGH 12 OF VAN BUREN TRACT, AS SHOWN ON A MAP RECORDED IN BOOK 8, PAGE 69 OF MAP IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL S10: (A.P. NO. 0297-071-08)
THE WEST HALF OF THE SOUTHEAST QUARTER OF SAID SECTION 7, COMPRISING 80 ACRES, MORE OR LESS.

LEGAL DESCRIPTION (Continued)

PARCEL S11: (A.P. NO. 0297-071-02, 0297-071-03, 0297-071-04)
LOTS 4 THROUGH 15 OF CHICAGO SUBDIVISION TO REDLANDS, AS SHOWN ON A MAP RECORDED IN BOOK 12, PAGE 52 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL S12: (A.P. NO. 0168-311-06)
THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 7.

PARCEL S13: (A.P. NO. 0297-051-01 AND 0297-051-02)
THE NORTHWEST QUARTER OF SAID SECTION 7.

PARCEL S14: (A.P. NO. 0297-011-07)
THAT PORTION OF THE SOUTHWEST QUARTER OF SAID SECTION 6, LYING SOUTH OF THE SOUTH LINE OF THE EXISTING METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA PIPELINE RIGHT OF WAY AS THE SAME NOW EXISTS. EXCEPT THAT PORTION THEREOF CONVEYED TO THE NORTHFORK WATER COMPANY BY DEED RECORDED MARCH 7, 1909 IN BOOK 388 OF DEEDS, PAGE 120, RECORDS OF SAID COUNTY.

PARCEL S15: (A.P. NO. 0291-151-05)
PARCEL 1 OF THAT CERTAIN DEED RECORDED JUNE 28, 1984 AS INSTRUMENT NO. 84-152554 OF OFFICIAL RECORDS, RECORDS OF SAID COUNTY.

SUBJECT TO ALL RESERVATIONS, RESTRICTIONS, EASEMENTS, OFFERS OF DEDICATIONS, RIGHTS AND RIGHT OF WAYS OF RECORD.

This legal description was prepared by me or under my direction.

By:_____
Edward J. Bonadiman, P.L.S.
Date: 09/17/2012 L. S. #:7529

EXHIBIT 1B
LEGAL DESCRIPTION
BLM PROPERTY ACCESS

THOSE PORTIONS OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN AND THOSE PORTIONS OF SECTION 12, TOWNSHIP 1 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF HIGHLAND, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, DESCRIBED AS FOLLOWS:

PARCEL B1: (A.P. NO. 0297-161-05)
THE WEST HALF THE SOUTHWEST QUARTER OF SAID SECTION 12.

PARCEL B2: (A.P. NO. 0297-161-06)
THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 12.

PARCEL B3: (A.P. NO. 0297-161-01)
THE NORTH HALF OF THE SOUTHEAST QUARTER OF SAID SECTION 12.

PARCEL B4: (A.P. NO. 0297-161-03)
THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 12.

PARCEL B5: (A.P. NO. 0297-061-02)
THE SOUTH HALF OF THE NORTHWEST QUARTER OF SAID SECTION 8.

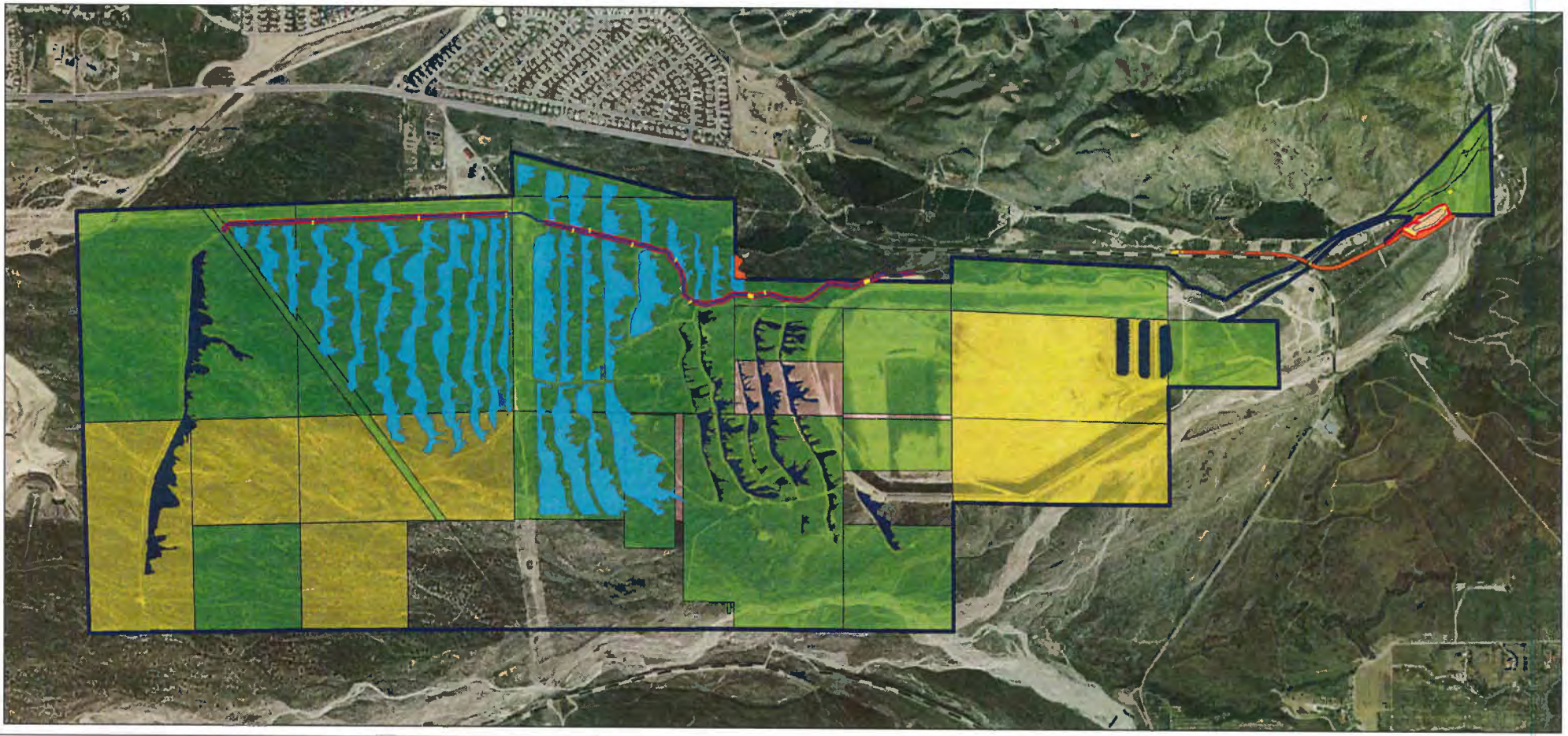
PARCEL B6: (A.P. NO. 0297-061-02)
THE NORTH HALF OF THE SOUTHWEST QUARTER OF SAID SECTION 8.

SUBJECT TO ALL RESERVATIONS, RESTRICTIONS, EASEMENTS, OFFERS OF DEDICATIONS, RIGHTS AND RIGHT OF WAYS OF RECORD.

This legal description was prepared by me or under my direction.

By:_____
Edward J. Bonadiman, P.L.S.
Date: 09/17/2012 L. S. #:7529

EXHIBIT 2



Legend

- Wash Plan Area Boundary
- Structures
- Canal
- Access Road
- Existing Basins
- Sedimentation Basins
- Pipeline Easement
- Planned Improvements
- SAR Recharge Area (1485 Acres)
- SBVWCD Lands (952 Acres)
- BLM Property Access (513 Acres)
- Other Ownership Limited Access

Exhibit 2

N
W E
S

0 950 1,900 3,800

Feet

C. Brudin
14 Sept 2012
M:\2011 Projects\Land Ownership District_Exhibit1.mxd

SBV WATER CONSERVATION DISTRICT

OUR NAME IS OUR MISSION

Exhibit 3

Cemex Lease

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

San Bernardino Valley Water
Conservation District
1630 West Redlands Boulevard
Suite A
Redlands, CA 92373-8032

Attn: General Manager

FREE RECORDING REQUESTED
UNDER GOVERNMENT CODE
SECTION 6103

THIS SPACE FOR RECORDER'S USE ONLY

MINERAL LEASE FOR EXTRACTION OF SAND AND GRAVEL MATERIALS

THIS MINERAL LEASE FOR EXTRACTION OF SAND AND GRAVEL MATERIALS ("Lease") is entered into this 1 day of November, 2011, by and between SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT ("District") and CEMEX CONSTRUCTION MATERIALS PACIFIC, LLC ("Lessee"). This Lease is entered into in consideration of all of the following:

A. District is a California Water Conservation District, duly formed and existing under California Water Code section 74000 et seq. District has the authority to enter into leases of property it owns pursuant to provisions of California Water Code section 74550, and other provisions of law. Lessee is a limited liability corporation, with its principal place of business located in El Dorado Hills, California. Lessee is the successor-in-interest to a prior lease agreement between the District and C. L. Pharris Sand & Gravel, Inc.

B. District's and Lessee's predecessor-in-interest, C. L. Pharris Sand & Gravel, Inc., entered into a "Lease Agreement" dated September 10, 1979. That Lease Agreement authorized various excavation and sale of sand, gravel, and related material from property owned by the District, on terms and conditions stated therein, and incorporating prior leases between the parties (collectively "Original Lease").

C. The Original Lease was amended variously between the parties over time, culminating on a "Lease Amendment" dated July 10, 1997. Under the "Lease Amendment," the term of the lease was defined as an initial term ending June 1, 2011, with nine (9) additional successive five (5) year options to renew. The Lease Amendment required renewal notices to be in writing, made no later than six (6) months prior to the expiration of the then-existing term. The parties followed these procedures through the first five (5)-year extension of the term.

D. A dispute then arose between Lessee and the District regarding Lessee's expressed intent to enter an additional five (5)-year term under the lease. District rejected Lessee's attempt to exercise an additional five (5)-year option as untimely, and considers the lease effectively terminated as of June 1, 2011. Lessee believes that the option for an additional five (5)-year period under the lease was properly exercised, and that the term of the original lease, as modified by the Lease Amendment, continues until June 1, 2016.

E. The parties have met and conferred pursuant to a "Tolling Agreement Re Lease Dispute," they entered into on or about June 1, 2011 and extended on August 31, 2011 to resolve their differences. Pursuant to such discussions, the parties have now determined to enter into a new lease, defining new terms, and replacing, superseding, and rendering of no further effect the Original Lease, the Lease Amendment, and all previous agreements between District and Lessee with respect to lease of the District's property.

NOW, THEREFORE, in consideration of all of the foregoing, the parties do hereby set forth the terms of their new and sole lease agreement as follows:

1.0 Definitions. As used herein, the following terms shall have the following defined meanings:

1.1. "DISTRICT" shall mean the San Bernardino Valley Water Conservation District.

1.2. "LESSEE" shall mean Cemex Construction Materials Pacific, LLC, and its successors and assigns.

1.3. "PREMISES" shall mean all those properties owned by DISTRICT, more specifically described in the legal description attached hereto as Exhibit "A" and as more specifically depicted in the plat map attached hereto as Exhibit "B," with the exception of the northeasterly one-quarter of Section 12, which shall not be included within the PREMISES.

1.4. "MATERIAL" shall mean sand, rock, gravel, and kindred substances, lying on or under the PREMISES, and suitable for commercial extraction, processing, and sale, and any saleable by-products from same.

1.5. "Ton" shall mean a measurement of 2,000 pounds of material aggregate, by weight.

1.6. "INDEX" shall mean the Bureau of Labor Statistics Producer Price Index for Mining (Except Oil and Gas): NAICS 212, or if such index is no longer published or kept, such similar index as may be agreed to by the parties.

1.7. "FAIR MARKET ROYALTY" shall mean the prevailing market royalty rate being paid for Material within the markets served or able to be served by Material from the Premises, and such markets as may be reasonably comparable thereto, as of a then-present data value.

1.8. "WASH PLAN" shall mean the Upper Santa Ana River Wash Land Management and Habitat Conservation Plan, a comprehensive land use, property exchange, and mining and related permitting effort undertaken by District, Lessee, and a number of other public and private entities for realignment of prior leases for sand and gravel extraction, and for accommodation of water conservation and species habitat preservation.

1.9. "TRANSFER PREMISES" shall mean those properties which District and Lessee agree are appropriate for replacement of any portion of the Premises which may be exchanged to the federal government, Bureau of Land Management, or other entity, under the implementation and effectuation of the Wash Plan, or otherwise rendered unavailable for extraction, processing, and sale of Material. The parties contemplate that the Transfer Premises will consist of a portion of those properties already proposed to be exchanged from the Bureau of Land Management to the District under the Wash Plan, or otherwise transferred from the federal government to the District for the purposes of making such transferred areas available for mining. District and Lessee agree, however, that availability of, and the specific areas of the Transfer Premises cannot be determined precisely at this time, and that the exact areas, locations and parameters of the Transfer Premises will have to be determined in connection with the ultimate approvals that might be obtained through the Wash Plan.

1.10. "COMMENCEMENT DATE" shall be the date this Lease becomes effective, November 1, 2011.

1.11. "LEASE YEAR" shall mean the year following the commencement date in the first year of this Lease, and for every subsequent year, the period beginning each year on the anniversary of the Commencement Date, and continuing one (1) year thereafter.

1.12. "ORANGE STREET PLANT SITE" shall mean that area generally described in the legal description and depicted on the plat map collectively attached as Exhibit "D" hereto, consisting of approximately 100 acres, on which Lessee has, as of the Commencement Date, established and maintains a mining processing plant.

1.13. "REDLANDS AGGREGATES SITE" shall mean the area generally described in the legal description and depicted on the plat map collectively attached as Exhibit "E" hereto.

2.0 Lease of Premises and Rights Conferred.

2.1. Under this Lease, District hereby grants to Lessee the right to come onto the Premises, and to dig, excavate, transport, wash, process, crush, convey, stockpile, and sell all Material on the Premises, consistent with any applicable federal, state, or local regulations, and conditions of any permits that may be applicable thereto. This Lease includes the right to maintain all processing plants, structures, facilities, and equipment legally established by Lessee and existing on the Premises as of the Commencement Date, as are necessary or suitable for the defined purposes of the Lease. Lessee may also establish such other plants, buildings, paved roadways, structures, or other permanent improvements, or any silt ponds or places for the deposition of impermeable materials (collectively "Improvements") on the Premises, as may be necessary or appropriate for accomplishment of the purposes of the Lease, subject to the prior

written approval of the District as to the location, extent, specifications, and composition of such improvements. District's approval shall not be unreasonably withheld, conditioned or delayed. District's approval of Lessee's Improvements shall be directed to District's reserved water spreading and other reserved rights in, to, and for the Premises under this Lease, and the compliance and consistency of such Improvements with the terms and conditions of this Lease, and shall not be directed to the suitability of such Improvements for Lessee's purposes, nor the design, effectiveness, safety, nor engineering suitability of such Improvements, except insofar as District may, but is not required to, confirm that such Improvements as proposed meet otherwise applicable legal requirements and standards. Lessee shall not undertake any construction of such improvements without prior District review and approval of the plan for the location and other specifications for such improvements. District shall have a period of 45 days after submission of the complete construction plans and working drawings by Lessee of any proposed improvement construction to approve, conditionally approve, or disapprove such proposed improvements. Any disapproval by District shall be accompanied by written statement of the reasons therefor, including an explanation of what would be required for approval. Upon District's failure to approve, conditionally approve, or disapprove the Improvements construction within the 45 day period, the plans shall be deemed approved as submitted, so long as they are consistent with all other applicable legal requirements and standards. Lessee may relocate any Improvements located on the Premises, subject to District's approval, in the same manner as for Lessee's original establishment of Improvements. District may require Lessee to remove any Improvements placed on the Premises for which Lessee failed to provide the 45 day notice and opportunity for review and approval of District called for hereunder to the extent such Improvements violate applicable legal requirements, without any liability of District to Lessee. Such Improvements so constructed shall be the property of Lessee during the duration of the Lease, and shall be removed by Lessee upon the expiration or earlier termination of this Lease; provided, however, District may in writing elect to permit Lessee to leave any or all of the Improvements on the Premises after expiration of the Lease, in which case all such Improvements shall become the property of the District. Lessee shall assume all maintenance and insurance responsibilities for any Improvements constructed on the Premises. In addition, Lessee shall provide District no less than forty-five (45) days' notice before Lessee establishes any staging areas, processing areas, unpaved but graded and compacted haul routes, and equipment servicing areas which do not otherwise fit the definition of Improvements provided above, though such facilities shall not require District's prior approval before Lessee may be permitted to place them on the Premises. Further, Lessee shall provide to District no less than fifteen (15) days' notice before Lessee establishes any portable crushing or processing sites, which do not otherwise fit the definition of Improvements provided above, though such facilities shall likewise not require District's prior approval before Lessee may be permitted to place them on the Premises.

2.2. Premises Leased in "As Is" Condition. Lessee acknowledges that it is granted lease rights to the Premises, and the right to move Material therefrom, on an "as is" basis, and Lessee takes and operates the Premises without reliance on any representation by the District, or any of its officers, employees, agents, or representatives, or any other person, concerning the extent or quality of the Material on the Premises, its fitness for Lessee's intended use, or any particular purpose or use, its income producing history, potential, or capabilities, its value, or any other promise, representation, or inducement not expressly set forth in writing in

this Lease. District represents and warrants that it has not caused nor is aware of any environmental conditions relating to the Premises.

2.3. No Warranty. Lessee acknowledges that neither the District, nor any of its officers, employees, agents, or representatives, has made any written or oral representation, promise, or warranty, express or implied, arising out of or in connection with the Material on the Premises, or the transfer of Premises, if any, its fitness for Lessee's intended use, or any purpose or use, its income producing history, potential or capabilities, its value, the likely success or outcome of the Wash Plan, or any other matter not expressly set forth in writing in this Lease. Lessee acknowledges it has inspected, and occupied, the Premises prior to the execution of this Lease. Lessee acknowledges it takes and accepts the Premises in the condition in which the Material on the Premises (or lack thereof) exists as of the Commencement Date this Lease. Lessee assumes that any and all change in the condition of the rock on the Premises either before the Commencement Date or during the term of this Lease.

3.0 Lease Term.

3.1. Original Term. This lease shall begin on the Commencement Date, and shall continue in full force and effect for a period of four (4) years thereafter.

3.2. Options to Renew and Right of First Refusal. So long as Lessee shall not be in material breach of this Lease, Lessee shall have one (1) additional, successive six -year option to renew ("Option to Renew"). The renewal shall be on the terms of this Lease, or such additional or revised terms as the parties may then agree to.

3.3. Procedure for Exercise of Options.

(a) Initial Option. In the event Lessee elects to exercise the Option to Renew, Lessee shall provide written notice to District in writing. Such Option to Renew shall be made no later than one hundred eighty (180) days prior to the expiration of the Original Term of this Lease, to the person and in the manner set forth herein for the provision of Notices in Section 14.1 below.

(b) Exclusive Negotiation Period. In the event Lessee fails to exercise the six (6) year option provided for above, this Lease shall terminate as of the expiration of the initial four-year term. In the event Lessee does exercise the six (6) year option, Lessee shall have an Exclusive Negotiation Period with the District to meet and confer with District regarding the terms and conditions of a renewal or replacement lease for the Premises. Such Exclusive Negotiation Period shall run concurrently with the final ninety (90) days of the six (6) year option period so exercised by Lessee. The Exclusive Negotiation Period shall arise only upon the expiration of the exercised six (6) year option term; there shall be no Exclusive Negotiation Period upon the termination of the Lease, for whatever reason, or in the event of a Lessee default. During the Exclusive Negotiation Period, District shall not make any effort to sell, lease, offer, market, or solicit proposals with or from any party for the excavation, processing, or sale of Material from the Premises, except Lessee. Neither District nor Lessee shall be

obligated to enter into any type of an agreement during or as a result of the Exclusive Negotiation Period, but the parties shall meet and confer in good faith to discuss and explore the possibility of entering into such an agreement, should the parties determine that doing so would be in their mutual benefit.

(c) Right of First Refusal. In the event the Exclusive Negotiation Period occurs, and fails to result in an agreement between District and Lessee, and only in such event, Lessee shall have a Right of First Refusal upon any offer District may make to any other party for the right to excavate, process, or sell Material from all or any part of the Premises. Such Right of First Refusal shall entitle Lessee to priority acceptance of any such offer District may make to any other party, on the identical terms, conditions, requirements, and stipulations as the District makes, and is willing to accept, from any other party. The Right of First Refusal shall begin on the expiration of the Exclusive Negotiation Period, and shall continue for a period of three (3) years thereafter. District shall, prior to making or soliciting any offer for the right to excavate, process, or sell Material from the Premises advise the party or parties with whom it is dealing of the Lessee's Right of First Refusal. District shall require any offer it receives from any party to excavate, process, or sell Material from all or a portion of the Premises, and which it is prepared to accept and is authorized by its legislative body to accept, to be reduced to writing, and shall within thirty (30) days of any such offer, provide a written copy to Lessee, to the person and in the manner provided for in Section 14.1, Notices, below. Lessee shall have thirty (30) days thereafter to accept or reject the offer. In the event Lessee accepts the offer, District and Lessee shall enter into an agreement, on the identical terms as proposed to District and conveyed to Lessee. In the event Lessee rejects the offer, the Right of First Refusal shall thereupon terminate, and be of no further force and effect.

4.0 Royalty and Rental Payments.

4.1. Orange Street Plant Site Rent. Lessee shall pay to District, throughout the entire term of this Lease and any holdover period, the sum of Four Thousand Dollars ($4,000.00) per month for the lease of the Orange Street Plant Site ("Orange Street Plant Site Rent"). Such rent shall be in addition to, and shall not be credited against, any royalty amounts due, including guaranteed annual minimum royalty, which may be otherwise due and owing under this Lease.

4.2. Royalty. In addition to the plant site rent, Lessee shall pay a royalty to District, for every ton of Material removed from the Premises, as measured by State certified truck scales and recorded by a standardized, nationally recognized ticketing system whose mechanics and accuracy are disclosed and available to, and verifiable by, District. Lessee shall keep true, complete, and accurate records of all Material excavated on and removed from the Premises, and an accounting of all Material excavated and removed from the Redlands Aggregates Site. . Lessee shall report such figures, under penalty of perjury, to District on a monthly basis, in a form as District may reasonably specify and require. The parties shall track, calculate, and collect the royalty due on the excavated Material based on the amount of tonnage of Material sold or otherwise removed from the Premises and the Redlands Aggregates Site.

Any differences between the amount of Material excavated and the amount of Material sold or otherwise removed from the Premises shall be reconciled by way of a biannual audit. On or before ninety (90) days following the execution of this Agreement by both parties, District and Lessee shall jointly select and retain a party to perform a baseline aerial topographic survey of the Premises and the Redlands Aggregates Site. The parties shall share equally in the expense of the baseline aerial topographic survey, and once it is generated and delivered, the parties shall meet and confer to work out any issues or disagreements they may have regarding it, and both shall indicate in writing their approval of same, once any issues with the baseline survey that may arise are resolved. Once approved by both parties, the baseline aerial topographic survey shall serve as the beginning survey for later aerial topographic surveys to be performed under this Lease, for volumetric calculations of material excavated, inventoried, deposited into silt ponds, and removed from the premises by deduction. The volumetric results will be used to assess, compare, and reconcile the truck scale weight measurements. Based upon the results of the area topographic survey, Lessee and District shall reconcile the amounts paid on the tonnage sold or otherwise removed from the Premises and the Redlands Aggregates Site, and make any necessary adjustments to account for differences in the royalties due for Material from the Premises, and that from the Redlands Aggregates Site, and reconcile any amounts due or any credit for any amounts that may be overpaid during the immediately preceding twenty-four (24) month period. In the event the parties are unable to come to an agreement on such reconciliation, the matter shall be submitted to binding arbitration, as provided for herein.

4.3. Royalty Rate. For the first twelve (12) month period following the Commencement Date, the royalty rate shall be set at Fifty-Five Cents ($0.55) per ton. As of the first anniversary of the Commencement Date, the royalty rate shall be the Fair Market Royalty. On or before ninety (90) days prior to the first anniversary of the Commencement Date, the parties shall meet and confer, in an attempt to come to an agreement on the Fair Market Royalty. The parties shall provide, one to the other, any and all market analyses, appraisals, or other valuation Materials or opinions upon which their proposed Fair Market Royalty is based. If no agreement is reached within thirty (30) days of the parties' exchange of such information, the matter shall be submitted to binding arbitration, as provided for herein. The arbitrator shall select either one or the other of the parties' original Fair Market Royalty proposals, and the Fair Market Royalty rate so selected shall be the royalty rate paid by Lessee to the District for the remainder of the term, subject to any Index adjustment. The arbitrator shall not have the authority or discretion to compromise between the two parties' proposals, nor to come to an independent determination of the Fair Market Royalty rate. In the arbitration, no party may rely on, or submit to the arbitrator, any Material which was not originally exchanged pursuant to the exchange of Fair Market Royalty proposals ninety (90) days before the Commencement Date. The arbitrator shall only select one of the parties' Fair Market Royalty rates, which he or she determines most accurately determines the appropriate Fair Market Royalty.

4.4. Index Adjustment. All royalty rates shall be adjusted annually, on each anniversary of the Commencement Date, by any change in the Index, using 2012 as the base year. In no event, however, shall such change in any one year amount to a change in the applicable royalty rate more than fifty percent (50%), higher or lower, than the immediately preceding Fair Market Royalty rate. Such fifty percent limitation shall operate only to serve as the cap or floor for the year in which the change in the Index results in a change in the royalty rate of 50% or more, and not to change prospectively the Index calculation for succeeding years.

4.5. Guaranteed Annual Royalty; Orange Street Plant Site Material as Recovery of Credits.

(a) Guaranteed Annual Royalty Payments. Notwithstanding the level of excavation or sale of Material from the Premises, Lessee shall pay to District a guaranteed annual royalty, in addition to the Orange Street Plant Site rent. Such guaranteed annual royalty shall be in the amount of One Hundred Fifty Thousand Dollars ($150,000.00) for the first year of the Lease, and shall increase by an additional One Hundred Thousand Dollars ($100,000.00) on each anniversary of the Commencement Date thereafter; provided, however, such guaranteed annual royalty shall not exceed $550,000.00 annually. Such guaranteed annual royalty shall be paid in equal monthly installments, and shall be submitted along with all reporting by Lessee of its excavation and sales activities on the Premises and the Redlands Aggregate Site, comparing the amounts of guaranteed annual royalty paid, against the actual amount of Material excavated, and the actual amount of Material sold or otherwise removed from the Premises. The guaranteed annual royalty amount shall be paid by Lessee to the District; provided, however, to the extent District has Annual Royalty Credits in excess of Three Million Four Hundred Thousand Dollars ($3,400,000.00) ("Royalty Credits Cap"), Lessee's obligation to pay Guaranteed Annual Royalty Payments shall be suspended until such time as the Annual Royalty Credits are reduced below the Royalty Credits Cap., All per-ton royalty rates applicable to Material excavated by Lessee in excess of the guaranteed annual royalty rate shall be paid at the then-prevailing royalty rate, in addition to guaranteed annual royalty.

(b) Guaranteed Annual Royalty Credits. To the extent the per-ton royalty rate paid by Lessee in any given Lease Year is less than the amount of guaranteed annual royalty, Lessee shall be credited for the difference against any per-ton royalties otherwise due in any succeeding Lease Years above the guaranteed annual royalty due in such Lease Year, until all such credits have been offset against per-ton royalties in excess of applicable guaranteed annual rental. In no event shall such credit ever diminish or decrease the amount of guaranteed annual royalty due.

(c) Orange Street Plant Site Holdover to Retire Guaranteed Annual Royalty Credits. Except in the event of a Lessee default under Section 10.1 below, should this Lease expire or otherwise terminate prior to the time Lessee's guaranteed annual royalty credits have been retired, Lessee shall have the right, but not the obligation, to hold over and continue to occupy the Orange Street Plant site only, to remove any Improvements or other equipment or operations thereon, and to excavate and sell Material from such site. Such holdover right shall begin on the date the Lease expires or is terminated for any reason, including Lessee's exercise of its right of termination under Section 10.3 below. No guaranteed annual royalty or other royalty amounts shall be paid to District on the Material excavated and sold by Lessee from the Orange Street Plant Site during the holdover period, and such amounts of such per-ton royalties as would otherwise be applicable to the Material, as adjusted by the Index through and

including the holdover period, shall be applied to reduce the credits for guaranteed annual royalty payments made in excess of royalties paid on a per-ton basis. Lessee shall pay the Orange Street Plant site rent for all time that Lessee occupies the Orange Street Plant site during such holdover period, and such Orange Street Plant Site rental shall be adjusted by the Index, using the Effective Date as the base period and the beginning of the holdover period as the adjustment date for application of the Index adjustment. Thereafter, on each anniversary date of the beginning of the holdover period, the Orange Street Plant Site rent shall be adjusted again, per the Index. Such Orange Street Plant Site rent shall not be offset against or reduced to retire any guaranteed annual royalty credits. Lessee's right to hold over on the Orange Street Plant site shall continue only until the per-ton royalty amounts applicable to such Material excavated and sold by Lessee from the Orange Street Plant Site during the holdover period are equal to the sum total of guaranteed annual royalty credits for Lessee's payments of guaranteed annual royalty in excess of per-ton royalty, which accrued prior to the holdover period, but in no event longer than five (5) years from the time of the Lease's expiration or earlier termination. Any guaranteed annual royalty credits not retired within the applicable holdover period shall be lost, and forfeited without any further liability from District to Lessee.

4.6. Late Payments. Any payment due hereunder shall be made within thirty (30) days of the expiration of the month during which the excavations occurred, or the sales or other transfers occurred. Late payments shall incur a one and one-half percent per month late charge, which charge shall be added to, and considered to be additional, rent.

5.0 Permits.

5.1. Wash Plan Processing. As of the Commencement Date the parties are cooperating as part of the Upper Santa Ana River Wash Land Management and Habitat Conservation Plan Task Force ("Task Force") to process and secure approval of the Wash Plan. Under the agreement forming the Task Force, each of the participants was assigned a certain percentage of allocation for the overall costs of the Wash Plan. Beginning on the Commencement Date, and continuing until the Wash Plan gets final approval, or either parties' participation in the Task Force agreement shall have been finally terminated, either as provided in paragraph 23 of that agreement, or upon dissolution of the Task Force pursuant to paragraph 22 of the Task Force agreement, Lessee shall advance to District one-half of District's share of the Wash Plan processing and consultant costs, under the allocation as defined in the Task Force agreement. All such advanced costs shall be credited against any guaranteed annual royalty otherwise owing from Lessee to District, and to the extent such advanced costs exceed the amount of guaranteed annual royalty, shall be credited against future years' guaranteed annual royalty, until the entire amount of such advanced costs has been retired.

5.2. Lessee's Obligation to Secure Permits. Notwithstanding the parties' mutual efforts to effectuate the Wash Plan, it is and shall be the Lessee's sole responsibility to secure any and all land entitlements, SMARA permits or approvals, conditional use permits, or any and all discretionary permits required for Lessee to operate and maintain its operations on the Premises for the excavation, processing, removal, and sale of Material therefrom, including

any reclamation plans, or requirements, from all applicable federal, state and local jurisdictions (collectively "permits" herein). In the event the Wash Plan fails to result in the grant of such permits, Lessee shall diligently and continuously take all other actions necessary to obtain all permits required to accomplish the Material excavation purposes set forth herein, and shall obtain such permits at Lessee's sole cost and expense. Lessee shall submit to District, no less than forty five (45) days prior to submission of any permit application, or forty five (45) days prior to accepting any conditions that may be imposed on any such permit, all information, studies, applications, and other information relative to the permit or the proposed terms and conditions proposed to be imposed on same, for District's prior, written approval. District's review shall be limited to such permit applications, and / or permit conditions that the District determines, in the exercise of its reasonable discretion, could impair its ability to perform its water storage, conservation or spreading activities, or District's other reserved rights and uses in the Premises under this Lease, and / or impact the Premises beyond the term of this Lease. District shall not unreasonably disapprove the permit nor the conditions thereto. Lessee shall not finalize the permit, nor take any action in furtherance of conducting activities pursuant to any permit, until the District has approved the permit and any conditions thereto. In the event District fails to approve or disapprove any permit submitted to it by Lessee, provided that all proposed conditions have been documented and forwarded to District, within forty five (45) days from District's receipt of same from Lessee, the permit and conditions thereto shall be deemed approved by the District.

5.3. District Cooperation With Permits. District agrees that within the bounds of its reasonable discretion as reserved in Section 5.2 above, it will reasonably cooperate with Lessee and Lessee's efforts to obtain applicable permits and land use entitlements to allow Lessee to fulfill the purposes of this Lease, including, but not limited to, execution of petitions, applications or authorizations for applications. No consent given under this Lease by the District shall affect or limit Lessee's obligations under this Lease, nor shall any approvals or consents given by the District, in its capacity as the owner of the Premises, be deemed to be approval as to compliance or conformance of any application or any permit with applicable governmental codes, laws, orders, rules, or regulations.

5.4. Habitat Mitigation Dedications. District and Lessee acknowledge that effectuation of the Wash Plan, or potentially other permits should the Wash Plan not come fruition, may require the dedication by District of various areas, within or without the Premises, for endangered or threatened species habitat preservation or management. Notwithstanding this, however, District and Lessee agree to cooperate reasonably in an effort to effectuate the Wash Plan, as consistently as possible with the identified mitigation areas from the Final Environmental Impact Report for the Wash Plan certified by the District in 2008. The parties acknowledge the need to meet and confer, between themselves and other members of the Task Force, regarding the proper identification of any such required mitigation areas, the degree of reserved water conservation activity the District may require as a result of any encumbrance of District property for such purposes, and the nature and cost of habitat management strategies appropriate for such areas, none of whose specifics is presently known at this time. District and Lessee agree to cooperate reasonably on such subjects, in an attempt to effectuate the purposes of the Wash Plan and the purposes of this Lease.

5.5. Lessee Indemnification re Permit Challenges. Except at to such permits as may be obtained by the parties pursuant to the Wash Plan, Lessee shall indemnify, defend and hold the District harmless from any action, judicial or otherwise, contesting the validity of any permit granted to Lessee by the District or any other permitting jurisdiction, and Lessee shall promptly pay any judgment or award against the District in any such action, and shall take all other measures necessary to diligently defend and resolve any challenge to the validity of any such permit.

5.6. Transfer of Permits. Upon the expiration or earlier termination of this Lease, all transferable permits applicable to the Premises shall immediately transfer to the District, and Lessee shall take all actions required to complete such transfer, and otherwise cooperate fully with the District in accomplishing everything required to complete such transfer.

6.0 Use and Operation of Premises.

6.1. Safeguards. Lessee shall, at all times during this Lease, maintain proper and adequate safeguards on the Premises to assure its orderly use, and to prevent intrusion from trespassers, playing children and vandals.

6.2. No Waste or Nuisance. Lessee shall not maintain, commit or permit the maintenance of or commission of any waste or any nuisance (as defined in California Civil Code section 3479) within the premises. Lessee shall not use or permit the use of the Premises for any unlawful purpose.

6.3. Hazardous Materials Lessee shall not cause, permit or suffer the release or dumping of any Hazardous Materials on the Premises at any time. As used in this Lease, the term "Hazardous Materials" shall mean:

(a) Hazardous wastes, hazardous materials, hazardous substances, hazardous constituents, toxic substances or related materials, whether solids, liquids or gases, including but not limited to, substances deemed as "hazardous wastes," "hazardous materials," "hazardous substances," "toxic substances," "pollutants," "contaminants," "radioactive materials," or other similar designations in, or otherwise subject to regulation under, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §§ 9601 *et seq.*; the Toxic Substance Control Act ("TSCA"), 15 U.S.C. § 2601, *et seq.*; the Hazardous Materials Transportation Act, 49 U.S.C. § 1802; the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 9601, *et seq.*; the Clean Water Act ("CWA"), 33 U.S.C. § 1251, *et seq.*; the Safe Drinking Water Act, 42 U.S.C. § 300, *et seq.*; the Clean Air Act ("CAA"), 42 U.S.C. § 7401, *et seq.*; the Hazardous Waste Control Law, California Health & Safety Code § 2025, *et seq.* and Health & Safety Code § 33349; the Carpenter-Presley-Tanner Hazardous Substance Account Act, California Health & Safety Code Div. 20, Ch. 6.8; the Hazardous Materials Release Response Plans and Inventory Act, California Health & Safety Code Div. 20, Ch. 6.95; the Underground Storage of Hazardous Substances Act, California Health & Safety Code Div. 20, Ch. 6.7; the Porter-Cologne Act, California Water

Code § 13050, *et seq.*; and in any permits, licenses, approvals, plans, rules, regulations, or ordinances adopted, or other criteria and guidelines promulgated pursuant to, the preceding laws (collectively, the "Environmental Laws"); and

(b) Any other substances, constituents or wastes subject to any applicable federal, state or local law, regulation or ordinance, including any Environmental Law now in effect, including but not limited to petroleum, refined petroleum products, waste oil, waste aviation or motor vehicle fuel, asbestos, lead in water, paint or elsewhere, radon, polychlorinated biphenyls (PCBs), and ureaformaldehyde.

Lessee shall defend, indemnify, and hold District harmless for any release of any Hazardous Materials on the Premises caused by or arising from Lessee's possession of the Premises, or any of its activities undertaken thereunder except cause by the negligence or willful misconduct of District or any breach of District's warranties. Such indemnification shall include promptly paying any and all costs for site characterization, remediation, and any and all judgments for damages to persons or property, including any penalties, regulatory fines, or any other liabilities which may arise out of the Hazardous Materials released.

6.4. Maintenance and Perimeter Controls. Lessee shall, to the satisfaction of the District, keep and maintain the Premises and all improvements of any kind thereon in a state of good repair, clean, safe, and in compliance with all regulatory standards, laws, ordinances, statutes, and regulations applicable thereto, and any licenses or permits in connection therewith. Lessee shall maintain, and repair, fencing around the exterior boundaries of any active excavation on the Premises, so as to prevent purposeful or accidental intrusion by unauthorized persons or parties; provided, however, Lessee shall not be responsible or liable for maintenance, repair, or fencing around any portion of the Premises devoted to District's water spreading facilities on which no active excavation occurs. District shall be given keys, combinations, or other means of access through any such gates that may be connected or maintained pursuant to this requirement. Lessee and District shall each indemnify the other for any claims, liabilities, losses, or damages to persons or property caused by the indemnifying party's negligence or willful misconduct regarding such perimeter controls.

6.5. Mining Controls. In addition to complying with the conditions of any mining permit or other governmental approval relating to its mining activities, Lessee shall conduct its mining activities on the Premises subject to the following conditions and limitations:

(a) Timing. Lessee will notify the District in writing regarding which specific areas of the Lease Property will be mined, and at what times. Such notice shall be for the purpose of permitting the District to utilize portions of the Premises which are not actively being mined by Lessee, for water spreading activities or other activities which do not unreasonably inhibit or interfere with Lessee's proposed mining activity, which right is specifically granted to and reserved by the District. District and Lessee agree to reasonably coordinate their respective activities to minimize any interference with both groundwater recharge activities and mining activities.

(b) Mining Within Acceptable Distance to Groundwater.

(i) For all mining areas, Lessee shall establish, at its own cost, groundwater monitoring wells, at such times, and in such locations and numbers, as may be reasonably required by District to determine groundwater levels in the vicinity of active mining areas. Such wells shall be established in numbers and at locations sufficient to provide information regarding groundwater levels throughout the full extent of Lessee's active mining operations. District shall at all times have access to such wells, and may utilize such wells at any time to monitor or characterize groundwater levels; provided, however, District shall promptly replace or repair any damage caused by the District to the monitoring wells. Lessee does not warrant or confirm the accuracy of the monitoring wells and the District assumes all risk in utilizing the information obtained from the monitoring wells. District shall operate and maintain such wells, provided that Lessee shall not conduct any operations on the Premises which could damage or destroy such monitoring wells. Lessee shall promptly repair or replace any wells damaged by Lessee's mining or other activities, at Lessee's cost.

(ii) In the event groundwater levels in or around Lessee's mining operations rise to a point that is within twenty feet (20') of any active excavation, all such operations shall thereupon immediately be halted by Lessee, until such time as the groundwater table level drops to a point more than twenty feet (20') below the level of any active mining operations. Lessee shall be released from any payment obligations which accrue during any period in which Lessee is required to halt excavation activities under this subsection (ii). In addition, Lessee's Guaranteed Annual Royalty shall be reduced proportionally based on the number of days Lessee is required to cease excavation activities.

(iii) In the event of any unplanned cessation of mining activity by Lessee because of groundwater levels, District shall use its best efforts to redirect surface water recharge to areas which will not exacerbate high groundwater conditions in areas of active mining operations, and shall continue to do so until 1) the high groundwater conditions have abated, and mining activities can resume within the necessary twenty foot (20') separation between mining activities and groundwater levels in the affected area of active mining operations, or 2) it appears that District's operations are not affecting groundwater levels in the affected area of active mining operations, or 3) District has no reasonable alternative to spreading water in or around the areas of active mining operations.

(c) Depths. The Premises shall be mined in phased depths, as follows:

(i) In the initial phase, all of the Premises may be mined to a maximum depth of seventy-five feet (75').

(ii) In the second phase, all of the Premises may be mined to an additional depth of twenty-five feet (25'), provided:

(a) No more than fifteen percent (15%) of reserves are available to Lessee in the Premises above the Phase I depth limit of seventy-five feet (75') (excluding any reserves that are located at the Orange Street Plant Site which), lands are being utilized for processing, shipping, and storage of Materials; and

(b) Groundwater monitoring well information indicates such additional twenty-five foot depth can be achieved without posing an unreasonable risk of contamination, evaporation, or other risk, to groundwater.

(iii) The third phase will permit mining of the Lease Property to an additional depth of twenty feet (20'), provided:

(a) No more than fifteen percent (15%) of reserves are available to Lessee in the Premises above the Phase II depth limit of one hundred feet (100') (excluding any reserves that are located at the Orange Street Plant Site), which lands are being utilized for processing, shipping, and storage of Materials; and

(b) Groundwater monitoring wells indicate such additional depth can be achieved without posing an unreasonable risk of contamination, evaporation, or other risk, to groundwater.

(d) Side Slopes. For all portions of the Premises which are located in Section 12, mining shall be conducted in such manner that the ultimate side slope excavations and pit bottoms are never at any time steeper than 3:1 as measured from permitted setbacks. For those portions of the Premises located in Section 9, 10, and 11, side slopes shall be no steeper than 2:1 except existing slopes mined prior to the Effective Date left a finished slope steeper than 2:1, and the parties agree that Lessee has no obligation to correct those slopes. The ultimate side slopes, except at the Northwest corner of the Redlands Aggregate North parcel (south ½ of the northeast ¼ of Section 11, T1S, R3w, SBBM), and except where such side slopes were already in their final configuration as of the Effective Date of the July 10, 1997 Lease Amendment, shall be maintained in their natural condition, not reconstructed or recompacted.

6.6. Silt Deposits. District agrees that Lessee may deposit silt or impermeable fines within the Premises, only as follows:

(a) Alabama Pit No. 2 may be filled to its full capacity.

(b) The existing silt located along the north edge of the Johnson South Parcel and the existing silt pond on the Johnson North Parcel (consisting of the 80 acre parcel located in the South one-half of the Northwest one-quarter of

Section 11, T1S, R3W, SBBM), as shown and delineated in Exhibit "C" hereto, may remain, and effective on the Effective Date District waives any demand or claim for removal of silts deposited in such area by Lessee. District's waiver is of District's right, if any, to demand removal of such silts under its contractual rights as Lessor, and District makes no further representation or warranty regarding Lessee's ability to maintain any silts already deposited or whether such deposits comply with any applicable laws, statutes, regulations, or permit conditions of any kind. In addition, Lessee may use the Johnson North Parcel (but no portion of the Johnson South Parcel) for future deposit of silts or impermeable fines. Lessee shall not conduct any mining activity on the Premises north of the existing Johnson North parcel silt pond, except as may ultimately be allowed under the Wash Plan. The existing silt pond on the Johnson North Parcel (consisting of the 80 acre parcel located in the South one-half of the Northwest one-quarter of Section 11, T1S, R3W, SBBM), may remain. In addition, Lessee may use this area for future deposit of silts or impermeable fines. Lessee shall not conduct any mining activity on the Premises north of the existing Johnson North parcel silt pond.

(c) For both the Alabama Pit No. 2 and the Johnson North Parcel silt ponds, Lessee shall reclaim the areas by grading the top level of such silts or impermeable Materials according to the reasonable specifications of District, and by backfilling with non-silt, pervious earth Material of at least ten feet (10') of depth, and construct shallow water percolation basins and dikes thereon above the ten feet of pervious Material, all to the reasonable specifications of the District, so as to make the reclaimed land usable for spreading water in shallow surface ponds. Lessee shall not be responsible for payment of royalty for any Material excavated exclusively for such purposes.

(d) All pit bottoms shall be scarified to a depth of two feet (2'), as part of Lessee's reclamation activities, prior to quitting any mining site.

6.7. Lessee Production of Water. In addition to the groundwater monitoring wells provided for in Section 6.5 (2) (i), Lessee may sink such groundwater wells, or otherwise produce water from the Premises, as may be reasonably required in the quarrying, processing, and transportation of Material excavated and sold or removed from the Premises. Any wells established by Lessee on the Premises shall be considered improvements, and shall be subject to the requirements of Section 2.1 above. Lessee shall, in addition to any and all other payments due under this Lease, pay any groundwater charges associated with production of groundwater from the Premises, at then-applicable rates, and shall pay any and all other permitting or other charges required to establish and operate such wells. In connection with such wells, Lessee shall, upon reasonable request by the District, provide such information regarding groundwater levels, or water quality, produced from such wells, as Lessee otherwise does or is required to produce as a well operator, at no additional charge to District

7.0 District's Reservations.

7.1. District's Reservation for Water Conservation Activities. District reserves the right, from time to time and as it deems necessary in the exercise of its reasonable discretion, to utilize all or any portion of the Premises for its water recharge, conservation, spreading, and other operations. In connection with the exercise of this reserved right, the Conservation District shall make every effort to harmonize its water conservation activities with the then-current and anticipated immediate future excavation and other activities of Lessee, with the goal that the mining activity and the water conservation activity can harmoniously exist, without interruption to either. In the exercise of these reserved conservation rights, District shall do all of the following:

(a) Provide Lessee no less than forty-eight (48) hours' notice of its need to utilize portions of any active excavation areas, or areas of active haul road or other transport of excavated Material to and from areas of excavation and the plant site or stockpiling sites utilized in connection with the same.

(b) District shall not take all then-permitted portions of the Premises, which at that time Lessee is or could actively mine, out of production.

(c) Except in circumstances of sudden threatening precipitation, threat of immediate flooding from dam releases or other causes, or other immediate danger to persons or property, District shall meet and confer with Lessee to determine the appropriate areas for the exercise of the District's reserved water spreading rights as they impact active areas of excavation or other Lessee activities, to harmonize the need for areas of spreading with the needs of portions of the Premises for the activities permitted or authorized by this lease.

7.2. No Liability. Notwithstanding the procedural restrictions above, District shall have no liability to Lessee for any interruptions to excavations, or any other activities Lessee may undertake on the Lease, from the exercise of its reserved water spreading rights except as otherwise provided herein.

7.3. Inspection and Monitoring. District shall have the right, at all times during the pendency of this Lease, and at its own expense, to have an inspector remain on the Premises, including any plant site, scales, or sales areas, to observe, monitor, and inspect all aspects of Lessee's operations, and to confirm the validity and accuracy of Lessee's record keeping with respect to excavation and sale and removal of Material, and Lessee's compliance with all other aspects of the Lease. Such inspector shall be required to have all reasonable safety clearances or certifications required to access such areas of the Premises as District desires to monitor, as may be required under federal, state, or local statute, ordinance, or regulation. In addition, the inspector shall comply with Lessee's reasonable operating procedures and regulations, and shall undertake its monitoring activities in such a way as not to unduly disrupt, delay, or interfere with Lessee's operations.

7.4. Periodic Inspections. Whether or not District exercises its right to have an inspector on the Premises, District may, at any time during the pendency of this Lease, and upon no less than twenty four (24) hours' notice, come on to the Premises to assure compliance with permit conditions, conditions of the Lease, or the proper counting of tonnages excavated or sold.

7.5. Confidentiality of Information. All information received by the District pursuant to any inspector it maintains on the Premises, or any of its periodic inspections, shall be used solely for the purpose of assuring compliance with the terms of the Lease, and shall be considered confidential to Lessee, and kept confidential by District to the full extent permitted by the law. In connection with the receipt of such information, both District and Lessee specifically intend that the information is considered to be protected under Government Code section 6254(e), and shall not constitute a public record.

7.6. Audit. District may, no more frequently than once every two (2) years, and at its own expense require a full audit of Lessee's books, records, receipts, accounts, and any or all other information pertinent to the payment of plant site rent, royalties, or guaranteed annual royalty hereunder, including tonnages of Material excavated, sold, or otherwise transferred from the Premises the Redlands Aggregates Site, or both. Lessee shall reasonably and promptly cooperate with any and all requests made by District in connection with such audit, and any and all information received by the District in connection with such audit shall be considered confidential, as provided in the immediately preceding Section. To the extent the audit reveals any discrepancies between the amounts of plant site rent, royalty, or guaranteed annual royalties due, or any claimed offsets for Wash Plan processing costs or other items that may be agreed to between the parties as a legitimate offset to any amounts otherwise owing under the Lease, the party from whom either payment or refund is owing shall promptly pay the amount indicated by the audit. In the event of any disagreement as to the accuracy or results of the audit, the matter shall be submitted to binding arbitration, as provided for herein.

8.0 Binding Arbitration. In the event of any dispute arising under this Lease, including but not limited to disputes with respect to tonnages of Material excavated or sold or otherwise removed from the site, amounts of plant site rent, per-ton royalty, or guaranteed annual royalty, advanced costs for Wash Plan processing, or other amounts claimed due from one party to the other under this Lease, the determination of Fair Market Royalty, or any other controversy or dispute arising under this Lease, the matter shall be submitted to binding arbitration. To the extent not otherwise provided herein, any party wishing to submit any disagreement or alleged breach or noncompliance with any of the covenants or other provisions of this Lease shall first make demand upon the other party, in writing, specifying the issue, the amounts claimed due if known, and the steps it requires of the other party to resolve the dispute. Following such written notice, the parties shall, unless a different time period is specifically provided for otherwise herein, meet and confer in an attempt to resolve the dispute for a period of fourteen (14) days thereafter. In the event parties are unable to come to resolution, either party may demand that the matter may be submitted to binding arbitration. If such a demand is made, both parties shall, within five (5) business days of the receipt of the written demand to submit to arbitration, submit to the other a list of three (3) proposed arbitrators. Following exchange of such lists, the parties shall attempt to mutually select a single arbitrator to arbitrate the dispute. In the event the parties are unable to do so, each of the parties shall strike two arbitrators from the list of the other party, and the two remaining listed arbitrators shall thereupon decide upon a third arbitrator, who shall be someone other than the three originally listed by either party. Arbitrations regarding Fair Market Royalty shall proceed as provided for in Section 4.3 above. Arbitrations on all other subjects shall proceed according to such rules as the parties may reasonably agree to, and in the absence of their ability to agree, upon such rules as may be imposed by the single selected arbitrator. The decision of the arbitrator shall be final and binding, with each party waiving any

right to jury or other judicial determination of the dispute, except that the award may be corrected, or vacated, as provided by Code of Civil Procedure sections 1280 et seq. Notwithstanding Code of Civil Procedure section 1286.4 and 1286.8, the award may also be vacated or corrected if it is clearly contrary to law. Each party shall initially bear its own costs and fees in connection with the prosecution and hearing of the arbitration, and shall pay one-half (1/2) of the costs of the arbitrator. The advanced share of the arbitrator's costs and expenses, and attorneys' fees, expert witness fees, and the fees of any audit shall be considered as recoverable costs of the arbitration, and the reasonable costs thereof shall be recoverable by the prevailing party, in addition to any other relief that might be awarded.

9.0 Insurance. Lessee shall maintain, and keep in effect, all of the following policies of insurance at all times it occupies the Premises:

9.1. Workers' Compensation Insurance. By signature hereunder, Lessee certifies that Lessee is aware of the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and Lessee will comply with such provisions before commencing the performance or the work of this Agreement.

9.2. Workers' Compensation and Employer's Liability Insurance. Lessee, its agents, and its sub-contractors shall cover or insure under the applicable laws relating to workers' compensation insurance, all of their employees employed directly by them or through subcontractors in carrying out the work contemplated under this Agreement, all in accordance with the Workers' Compensation and Insurance Act, Division IV of the Labor Code of the State of California and any Acts amendatory thereof. Lessee shall provide employer's liability insurance in the amount of, at least, $1,000,000 per accident for bodily injury and disease.

9.3. Liability Insurance. Lessee shall provide and maintain at all times during the performance of this Agreement, the following commercial general liability insurance:

(a) Coverage. Coverage shall be at least as broad as the following:

(1) Commercial General Liability. Commercial General Liability coverage (Occurrence Form CG 0001) in the amount of two million dollars ($2,000,000) per occurrence for bodily injury, personal injury, and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to the project/location (with the ISO CG 2501 or insurer's equivalent endorsement provided to the District) or the general aggregate limit shall be twice the required occurrence limit.

(2) Required Provisions. All policies specified hereunder shall state or be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days (10 days for nonpayment of premium) prior written notice by U.S. mail has been given to the District.

(3) Required Format. All of the liability insurance shall be provided on policy forms satisfactory to the District. All insurance

correspondence, notations, certificates, or other documents from the insurance carrier or agent/broker shall each separately reference the District project number.

(4) Deductibles and Self-Insured Retention. Any deductible or self-insurance retention must be declared to and approved by the District. At the option of the District, the insurer shall reduce or eliminate such deductibles or self-insured retention.

(5) Acceptability of Insurers. Insurance is to be placed with insurers having a current A.M. Best's rating of no less than A-:VII or equivalent or as otherwise approved by the District.

(6) Evidences and Cancellation of Insurance. Prior to execution of this Agreement, Lessee shall file with the District evidence of insurance satisfactory to the District. The insurer will give by U.S. mail written notice to the District at least thirty (30) days prior to the effective date of any cancellation, except for nonpayment of premium for which ten (10) days prior written notice will be given. Lessee shall, upon demand of the District, deliver to the District all such policy or policies of insurance and the receipts for payment of premiums thereon.

9.4. Subcontractors. In the event that Lessee employs other contractors as part of the services covered by this Agreement, it shall be the Lessee's responsibility to confirm that each subcontractor meets the minimum insurance requirements specified above.

10.0 Default or Termination.

10.1. Default by Lessee. Each and every covenant and agreement contained in this Lease is declared to be a condition to the Lease, and to the rights hereby granted to Lessee. Lessee shall be considered to have materially breached this Lease, giving the District the remedies set forth in Section 10.2 below, in the event that any one or more of the following occur:

(a) Lessee fails or refused to pay to the District any royalties or other rentals due hereunder when due, and such royalty or rent remains unpaid for thirty (30) days after written notice by the District to Lessee; or

(b) Lessee defaults in the performance of or breaches any covenant, condition, or provision contained in this requirement other than set forth in Section 10.1 (a) hereinabove, and such default or breach is not cured within thirty (30) days after written notice thereof is served by the District on Lessee, or if such cure is physically impossible to cure within thirty (30) days, Lessee has begun and diligently prosecuted such cure.

(c) Lessee becomes insolvent. For the purposes of this Lease, Lessee shall be conclusively presumed to have become insolvent if (i) a receiver is appointed to take possession of all or substantially all of Lessee's property

because of insolvency; or (ii) Lessee makes a general assignment for the benefit of creditors; or (iii) Lessee allows any judgment against Lessee to remain unsatisfied or unbonded for a period of thirty (30) days or longer; or (iv) an attachment or execution is levied upon or against any or all of Lessee's right, title, or interests in or under this Lease, and the same shall not have been released within thirty (30) days from the date thereof; or (v) proceedings or receivership in bankruptcy have been instituted against Lessee; or (vi) Lessee is adjudicated bankrupt.

(d) Any disagreement between the parties as to whether a default has occurred shall be decided by binding arbitration, as provided for herein.

10.2. Remedies on Lessee's Default. Should Lessee breach this Lease, the District may, in addition to any other remedy given the District by law or in equity:

(a) Continue this Lease in effect by not terminating Lessee's right to possession of the Premises, in which event District shall be entitled to enforce all of the District's rights and remedies under this Lease, including the right to recover the royalties and other rental payments specified herein, as such royalties and payments become due under this Lease; or

(b) Terminate this Lease and Lessee's right to possession of the Premises;

(c) In the event Lessee becomes insolvent, the District may, by giving thirty (30) days' written notice to Lessee or to the person appointed to manage Lessee's affairs at the address for such person appearing in the official records of the court that appointed such person, terminate this Lease and forfeit Lessee's rights under the Premises and in any Improvements or facilities on or appurtenant to the Premises.

The remedies herein shall not be exclusive, but shall be cumulative and in addition to any and all of the remedies now or hereafter allowed by law or otherwise authorized in this Lease, and the exercise of one or more of said rights, powers, elections, or remedies shall not impair the District's right to exercise any other right, power, election, or remedy.

10.3. Lessee's Right of Termination. Lessee may terminate this Lease, with or without cause, at any time after the first anniversary of the Commencement Date, by providing District no less than one hundred and eighty (180) days' written notice. Upon giving such notice, and until the one hundred eighty day period passes, the Lease shall remain in effect, and Lessee shall fulfill all obligations of Lessee hereunder which accrues during the one hundred eighty (180) days, including the payment of Orange Street Plant Site rent, guaranteed annual royalty and any per-ton royalty amounts.

10.4. Surrender of Possession. At the expiration or termination of this Lease, for whatever reason, Lessee shall execute, acknowledge, and deliver to the District a Quitclaim Deed conveying all right, title, and interest of the Lessee to the Premises, both land and improvements. Thereafter, Lessee shall promptly, but in any event no later than six (6) months

following the expiration or earlier termination of the Lease, remove all Improvements (unless the requirements for such removal has been waived in writing by District), portable buildings, equipment, and personal property placed on the Premises by Lessee, and clear the Premises of all debris, and otherwise surrender to the District the Premises in good order and clean condition.

10.5. Quiet Enjoyment. District represents, covenants and warrants that Lessee, upon paying the rent and performing the covenants herein provided, shall peacefully and quietly have, hold and enjoy the Premises, subject to District's reserved rights hereunder.

11.0 Encumbrance, Assignment, and Subletting.

11.1. Hypothecation.

(a) Lessee shall have the right at any time, from time to time, and subject to prior written approval of the District (except to the extent any Improvements are subject to an encumbrance prior to the execution of this Lease), to subject the leasehold estate and any or all Improvements placed or to be placed on the Premises to one or more deeds of trust or other security instruments (collectively "Leasehold Deed of Trust" herein) as security for a loan or loans or other obligation of Lessee, provided that:

(i) The Leasehold Deed of Trust and all rights acquired under it shall be subject and subordinate to each and all of the covenants, conditions, and restrictions stated in this Lease, and to all rights and interest of the District except as otherwise provided herein, and

(ii) Lessee shall give District prior notice of any such Leasehold Deed of Trust, and shall accompany the notice with a true copy of the note and deed of trust.

11.2. Assignment and Sublease; Transfer Restrictions. Lessee may assign or sublease all or a portion of its interest hereunder to any other entity, but only with the prior written permission of the District. For the purposes of this Lease, an "assignment" shall include a transfer to any person or group of persons acting in concert, of more than twenty-five percent (25%) of the present ownership and/or control of Lessee in the aggregate, taking all transfers into account on a cumulative basis, except transfers of such ownership or control interest between members of the same immediate family, or transfer to a trust, testamentary or otherwise, in which the beneficiaries are limited to members of the transferor's immediate family. In the event Lessee or its successor is a corporation or trust, such transfer shall refer to the transfer of the issued and outstanding capital stock of Lessee, or of the beneficial interests of such trust; in the event that Lessee or its successor is a limited or general partnership, such transfer shall refer to the transfer of more than twenty-five percent (25%) of the limited or general partnership interest; in the event that Lessee or its successor is a joint venture, such transfer shall refer to the transfer of more than twenty-five percent (25%) of the ownership and/or successor control of any such joint venture partner, taking all transfers into account on a cumulative basis.

11.3. Licenses. Lessee shall have the right to grant licenses for ingress and egress to the Premises in connection with any assignment or sublease, provided such licenses are

made specifically subject to the covenants contained in this Lease, and do not extend beyond the term of this Lease. Upon any assignment, the assigning Lessee shall have no further obligation or liability under this Lease with respect to the portion assigned, except for such obligations that arose from the period of such assigning Lessee's occupancy of the Premises, and the new Lessee shall agree in writing to be bound by all terms and conditions hereof.

12.0 Transfer Premises. The parties agree to cooperate reasonably in defining the Transfer Premises, either before or upon the final approval of the Wash Plan, if the Wash Plan becomes effectuated. The Transfer of Premises shall be identified by way of appropriate legal description and plat maps, and shall be incorporated as Premises to which this Lease applies by way of a written amendment to this Lease. The Transfer of Premises shall not be replaced for any portion of the Premises without the mutual agreement of District and Lessee.

13.0 Condemnation. If during the term of this Lease, all or any portion of the Premises is acquired for public use by the use of eminent domain, or transfer under threat of eminent domain, the following shall apply:

(a) District shall be entitled to all compensation awarded for the taking of the Premises, including any leasehold bonus value, except that Lessee shall be entitled to any portion of the award representing the value of its leasehold improvements (less any reversionary value allocable to District upon the scheduled end of the lease term), moveable equipment, inventory, moving expenses or relocation benefits, any award for loss of Lessee's business goodwill, and any separately-assessed attorneys fees or costs which are awarded solely to Lessee.

(b) If the entire Premises are taken pursuant to any condemnation proceeding, or acquisition under threat of condemnation, the Lease shall terminate in its entirety, effective on the date the acquiring entity takes actual possession of the Premises. If only a part of the Premises is taken pursuant to any condemnation proceeding, or acquisition under threat of condemnation, and the part taken is so essential that the remainder Premises subject to the Lease is no longer suitable for the purposes of the Lease, Lessee shall have the option to terminate this Lease. Such option shall be exercised in writing, no later than: (1) thirty (30) days after the filing of any complaint in eminent domain and service of same upon Lessee; or (2) within thirty (30) days of Lessee being notified, by District or any other party, of the acquiring entity's intent to acquire by eminent domain, accompanied by a legal description or other detailed indication of the specific area and property interests the acquiring entity proposes to take, whichever of the two occurs earlier. Any dispute between the District and Lessee as to whether a part taking taken is so essential that the remainder Premises subject to the Lease is no longer suitable for the purposes of the Lease shall be submitted to binding arbitration as provided herein if no condemnation action is then pending, and if such an action is pending, by the court hearing and determining such action.

(c) If only a part of the Premises is taken pursuant to a condemnation proceeding or acquisition under threat of condemnation, and there is either (1) no such material impairment of Lessee's use of the remaining portion of the Premises, or (2) Lessee otherwise elects not to terminate this Lease as provided in this Section, then the Lease shall terminate only as to the portion taken, effective on the date the acquiring entity takes actual possession of the portion taken, and the Lease shall continue in full force and effect as to the remaining portion of the Premises.

(d) If any portion of the plant site is taken as part of a partial taking, the plant site rent shall be reduced, in a percentage equal to the percentage the land taken area from the plant site bears to the total area of the plant site before the taking, such reduction to be effective on the date the Lease terminates as to the portion of the plant site taken. There shall be no reduction to the guaranteed annual royalty or the per-tonnage royalty, however.

14.0 Assignment and Transfer. The qualifications and identity of Lessee are of particular concern to District. It is because of those qualifications and identity that District has entered into this Agreement with Lessee. Accordingly, except as expressly set forth herein, Lessee shall not, whether voluntarily, involuntarily or by operation of law, assign, transfer or convey all or any part of this Agreement or any rights hereunder or in this Lease or the Premises without District's prior written approval, which shall not be unreasonably withheld, delayed or conditioned on items not related to the prospective assignee's financial ability to perform Lessee's requirements and obligations under this Lease, or the prospective assignee's ability to comply with the terms, conditions, or requirements of any applicable permit, entitlement, development condition, or provision of law governing the mining activities to be carried out on the premises under this Lease. Notwithstanding the foregoing, Lessee may assign its interest in this Lease to (a) an entity whose majority interest is owned or controlled by Lessee; or (b) a limited partnership or limited liability company whose general partner or managing member is Lessee. The term "control," as used in the immediately preceding sentence, means, with respect to a person that is a corporation, the right to exercise, directly or indirectly, at least 50% of the voting rights attributable to the shares of the controlled corporation, and, with respect to a person that is not a corporation, the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of the controlled person

If District approves the assignment, the approval shall be subject to the satisfaction of the following conditions ("**Transfer Conditions**"):

(a) All of the obligations of this Lease shall have been assumed by the transferee pursuant to a written assignment and assumption agreement(s) in a form reasonably approved by District's legal counsel.

(b) The organizational documents of the transferee and a good standing certificate of the transferee shall have been submitted to District.

(c) There shall be no default of Lessee of this Agreement and no event has occurred that would constitute a default with the giving of notice or the passage of time.

15.0 Miscellaneous Provisions.

15.1. Notices. As expressly provided to the contrary herein, any notice, consent, report, demand document, or other such item to be given, delivered, furnished, or received hereunder, shall be deemed given, delivered, furnished, or received when given in writing and personally delivered to an authorized agent of the applicable party, or upon delivery by United States Postal Service, first class registered or certified mail, postage prepaid, return receipt requested, or by national "overnight courier," such as Federal Express, at the time of delivery shown upon receipt, and in any case, delivered to the address, addresses, and persons as each party may from time to time, by written notice designate to the other, and who initially are:

If to District:	San Bernardino Valley Water Conservation District 1630 West Redlands Boulevard Suite A Redlands, California 92373 Attn: General Manager
With a Copy to:	Rutan & Tucker 611 Anton Boulevard Suite 1400 Costa Mesa, CA 92626 Attn: David B. Cosgrove
If to Lessee:	Cemex Construction Materials Pacific, LLC 5180 Golden Foothills Parkway Suite 200 El Dorado Hills, CA Attn: Tom Powell
With a Copy to:	Cemex 920 Memorial City Way, Suite 100 Houston, TX 77024 Attn: General Counsel

15.2. Interpretation. The terms of this Lease shall be construed in accordance with the meaning of the language used, and shall not be construed for or against either party by reason of authorship. This lease contains the full agreement of the parties with respect to the subject matter contained herein, and supersedes all prior leases, negotiations, agreements, and/or representations, whether oral or written. Specifically, this Lease supersedes the "Lease Agreement" dated September 10, 1979, between the District and C. L. Pharris Sand and Gravel, Inc., the "Lease Amendment" dated July 10, 1997 between the District and C. L. Pharris Sand

and Gravel, Inc., dba Sunwest Materials, and any other prior lease agreements between the parties with respect to any portion of the Premises. All such prior lease agreements are superseded and replaced by this Lease Agreement, including any options, rights of first refusal, or other rights that may arise thereunder, all of which are of no force or effect. This Lease constitutes the entire lease agreement between District and Lessee.

15.3. Amendment. This Lease may be amended at any time by mutual agreement of the parties, by an instrument in writing, signed by both parties, and referencing that it is an amendment to this Lease.

15.4. Corporate Authority. The persons executing this Lease on behalf of the parties hereto warrant that (i) the party on whose behalf the signature appears is duly organized and existing; (ii) such party is authorized to execute and deliver this Lease on behalf of such party; (iii) by so executing this Lease, such party is bound to the provisions of this Lease; and (iv) by entering into this Lease, such party does not violate any provision to any other agreement to which said party is bound. .

15.5. Binding on Successors. Subject to the transfer restrictions stated elsewhere in this Lease, this Lease shall be binding upon each party's respective successors and assigns.

15.6. Time is of the Essence. Time is of the essence in this Lease. Failure to comply with any requirement, including but not limited to any time requirement of this Lease shall constitute a material breach of the Lease.

15.7. Severability. The invalidity or illegality of any provision of this Lease shall not affect the remainder of the Lease. The parties hereby declare that it is their intent that, in the event one or more portions of the Lease is declared invalid or unenforceable, they intend that the remainder of the Lease continue to bind both parties, unless the severed remainder is so essential to the terms of this Lease that additional performance of the Lease is impossible or so uncertain as to render meaningful performance impossible or unrealistic.

15.8. Force Majeure. The time limits provided herein for performance of any actions required hereunder shall be extended during any time, but only during such time, as a party is unable to perform obligations to war, insurrection, strikes, lock-outs, riots, floods, earthquakes, fires, casualties, acts of the public enemy, epidemics, quarantine restrictions, freight embargoes, inaccessibility of transportation or critical infrastructure, governmental restrictions or priority litigation, acts of God, or other similar causes beyond the control of, and without the fault of, the party charged to perform. The party to perform shall continue to exercise reasonable diligence to minimize the period of delay during any period of force majeure. An extension of time for any such cause shall be limited to the period of the delay, and shall commence to run from the time of the commencement of the force majeure, provided notice by the party be to perform claiming such extension is sent to the other party within ten (10) days of the commencement of the cause.

15.9. Attorneys' Fees. In the event of any suit to enforce any provision of this Lease, or to prevent or to correct any breach of this agreement, the prevailing party in such

action or proceeding, in addition to any other relief which may be granted, legal or equitable, shall be entitled to reasonable attorneys' fees. As used herein, "attorneys' fees" shall include costs for legal services, and all other reasonable costs for investigating the action, including the taking of depositions and discovery, and any other recoverable costs. All such fees shall be deemed accrued on the commencement of such action, and shall be enforceable whether or not such action is prosecuted to final judgment. The court in any such action shall be requested to name a prevailing party.

15.10. Counterparts. This Lease may be executed in two or more counterparts, each of which shall be an original, but all of which shall constitute one and the same instrument.

Dated: _____

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

By: _____
Clare Henry Day, President

APPROVED AS TO FORM:

RUTAN & TUCKER, LLP

By: David B. Cosgrove
General Counsel

Dated: _____

CEMEX CONSTRUCTION MATERIALS PACIFIC, LLC

By: _____
V.P.

State of ~~California~~ Arizona

County of ~~Orange~~ Maricopa

Subscribed and sworn to (or affirmed) before me on this 28th day of October, 2011, by OSCAR FRIAS, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

VICKI L. MAJORS
Notary Public - State of Arizona
MARICOPA COUNTY
My Comm. Expires Aug. 30, 2013

Seal: _____

Signature Vicki L. Majors

State of California

County of ~~Orange~~ San Bernardino

Subscribed and sworn to (or affirmed) before me on this 21 day of October, 2011, by Claire Mary Day, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

Seal: GUAY P WILSON

Signature G P Wilson

GUAY P. WILSON
COMM. # 1847449
NOTARY PUBLIC - CALIFORNIA
SAN BERNARDINO COUNTY
My Comm. Expires May 3, 2013

State of California

County of ~~Orange~~ San Bernardino

Subscribed and sworn to (or affirmed) before me on this 31 day of October, 2011, by Chris Tenny, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

Seal: GUAY P WILSON

Signature G P Wilson

GUAY P. WILSON
COMM. # 1847449
NOTARY PUBLIC - CALIFORNIA
SAN BERNARDINO COUNTY
My Comm. Expires May 3, 2013

State of California

County of ~~Orange~~ San Bernardino

Subscribed and sworn to (or affirmed) before me on this _____ day of _____, 2011, by _____, proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

Seal: _____

Signature _____

Exhibit "A"

Legal Descriptions of: "PREMISES" Properties

	Approx. Acres
Parcel I-1: (Portion of WCD Parcel 11-2) North one-half of the North one-half of Section 11, T. 1 S. R. 3 W., SBB&M, excepting thereform the North 40 feet.	155
Parcel I-2: (Portion of WCD Parcel 11-1) South one-half of the Southeast Quarter of Section 11, T. 1 S., R. 3 W., SBB&M	80
Parcel I-3: (WCD Parcels 12-2 and 12-3) North one-half of Section 12, T. 1 S., R. 3 W., SBB&M, except that portion lying northeasterly of the southwesterly right-of-way of the AT&SFe Railroad.	143

Parcel I-3a: (WCD Parcel 12-3)
Three rights-of-way 80 feet wide across the AT&SFe right-of-way in the Southwest Quarter of the Northeast Quarter of said Section 12, as described in the deed from Charles Elliott to the San Bernardino & Eastern Railway Company

Recorded December 15, 1891
Book 144, page 16 of Records of
San Bernardino County, California.

Parcel II-A: (Portion of WCD Parcel 11-2) East one-half of the South one-half of the North one-half of Section 11, T. 1 S., R. 3 W., SBB&M	80
Parcel II-B: (WCD Parcel 11-3) North one-half of the Northwest Quarter of the Southwest Quarter of Section 11, T. 1 S., R. 3 S., SBB&M	20
Parcel II-C: (WCD Parcel 11-4) Northeast Quarter of the Southwest Quarter of Section 11, T. 1 S., R. 3 W., SBB&M	40

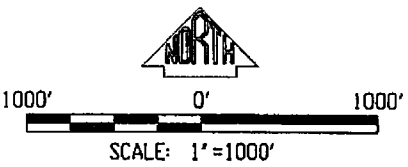
Saving and excepting from the above parcels the main canal of lessor which crosses the property in an east-west direction and reserving unto lessor an easement 40 feet wide across the property adjacent to the Southerly boundary.

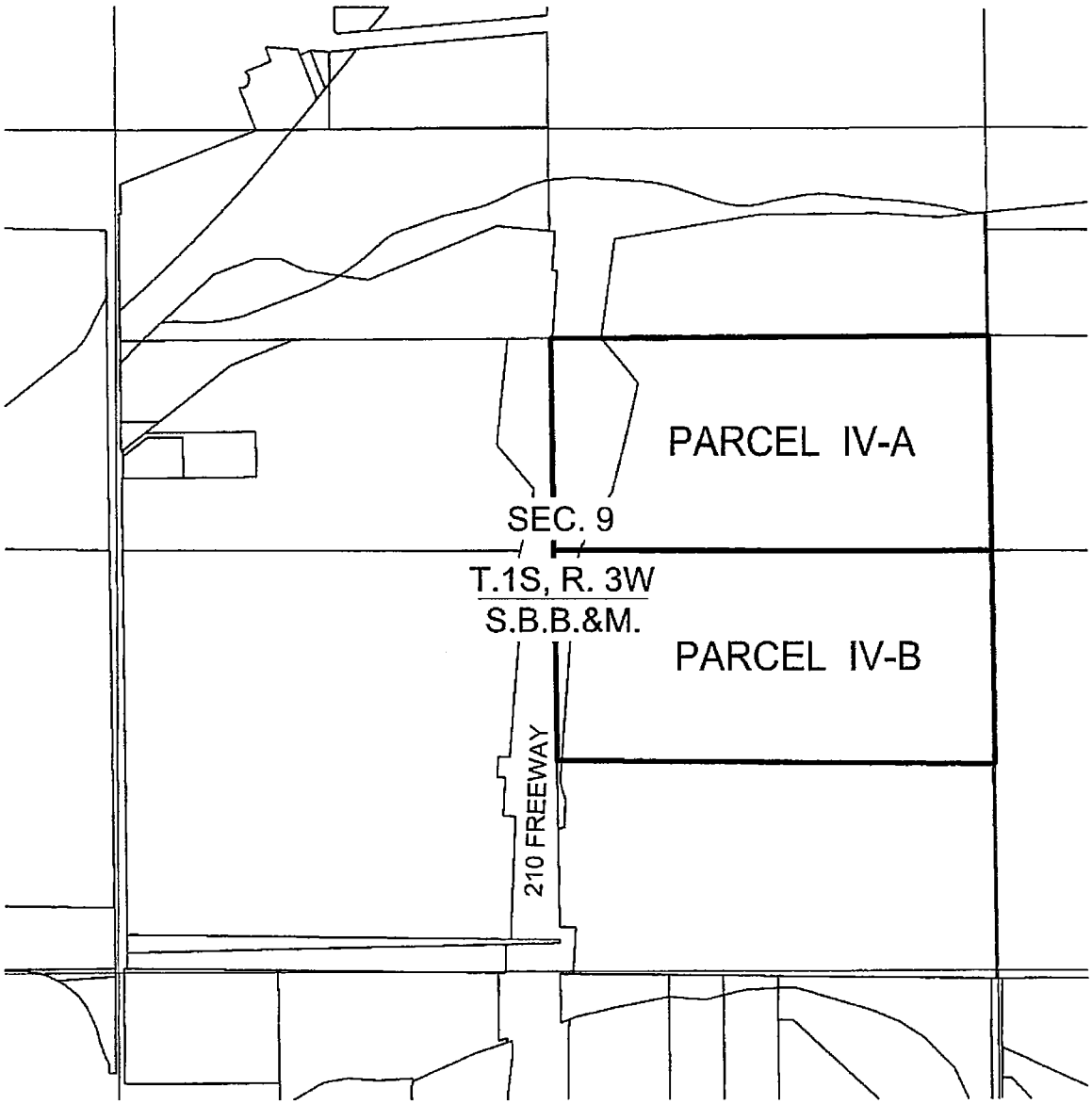
Parcel II-D: (Portion of WCD Parcel 10-2)
A non-exclusive easement across the North 60 feet of the North one-half of the Southeast Quarter of Section 10, T. 1 S., R. 3 W., SBB&M.

	Approx. Acres
Parcel II-E: (Portion of WCD Parcel 11-2) West one-half of the South one-half of the North one-half of Section 11, T. 1 S., R. 3 W., SBB&M	80
Parcel III-A: (Portion of WCD Parcel 11-1) The North one-half of the Southeast Quarter of Section 11, T. 1 S., R. 3 W., SBB&M	80
Parcel III-B: (WCD Parcel 10-2) The North one-half of the Southeast Quarter of Section 10, T. 1 S., R. 3 W., SBB&M, except the westerly 130+ feet thereof.	75
Parcel IV-A: (WCD Parcel 9-2) South one-half of the Northeast Quarter of Section 9, T. 1 S., R. 3 W., SBB&M.	80
Parcel IV-B: (Portion of WCD Parcel 9-1) North one-half of the Southeast Quarter of Section 9, T. 1 S., R. 3 W., SBB&M.	80

EXHIBIT "B"

NOV. 15, 2011





SEE SHEET 2 OF 4

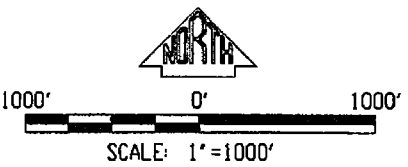
JOSEPH E. BONADIMAN & ASSOCIATES INC.
consulting engineers land surveyors

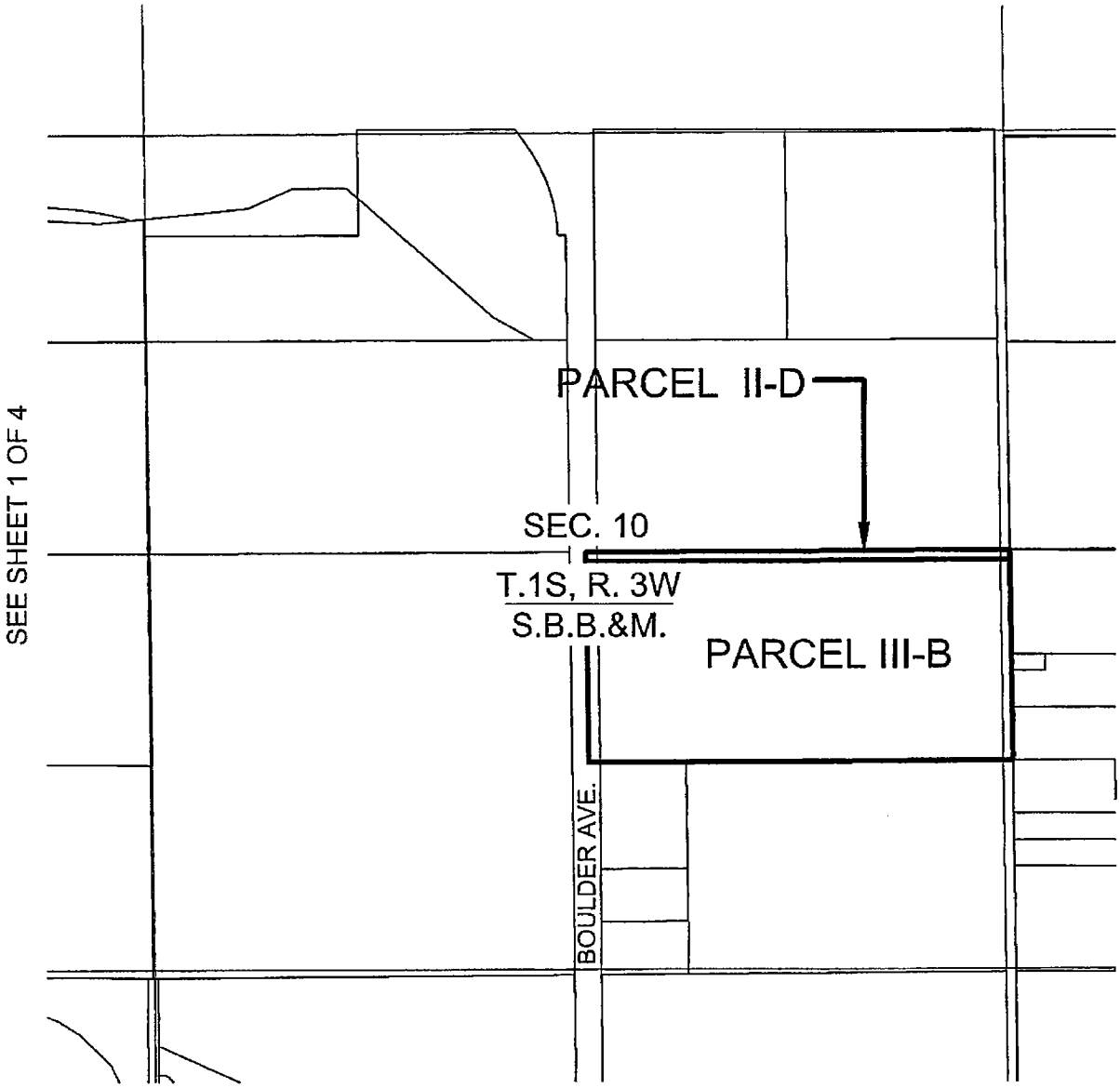
234 N. Arrowhead Ave., San Bernardino, CA. 92408
Phone: (909)885-3806 Fax: (909)381-1721

EXHIBIT "B"

(CONTINUED)

NOV. 15, 2011



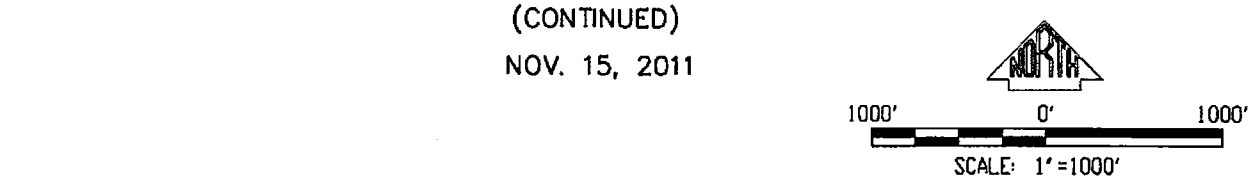


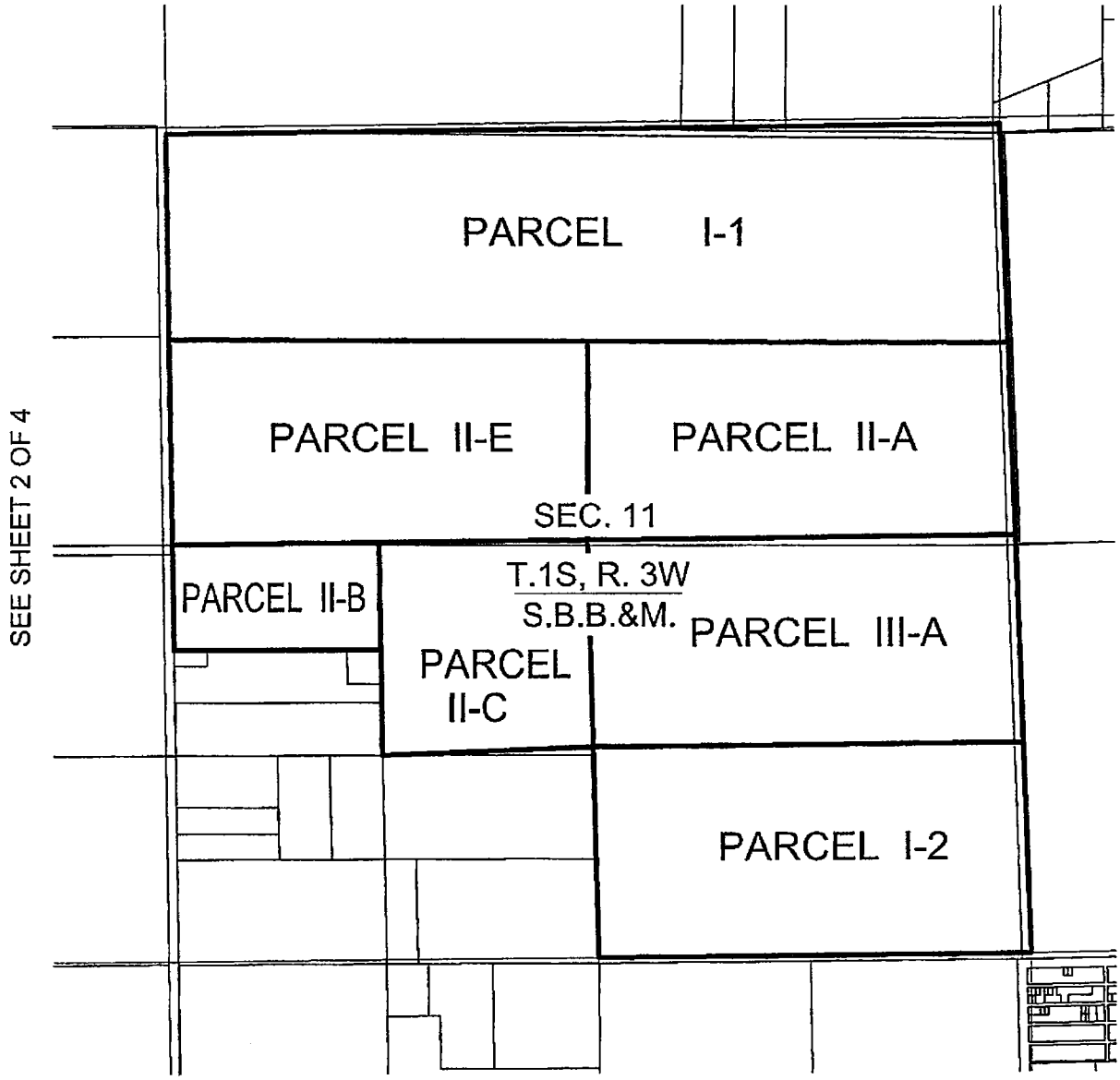
JOSEPH E. BONADIMAN & ASSOCIATES INC.
consulting engineers land surveyors

234 N. Arrowhead Ave., San Bernardino, CA. 92408
Phone: (909)885-3806 Fax: (909)381-1721

EXHIBIT "B"
(CONTINUED)

NOV. 15, 2011



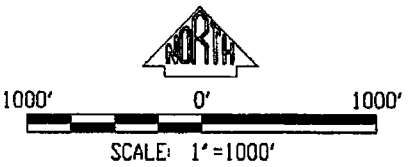


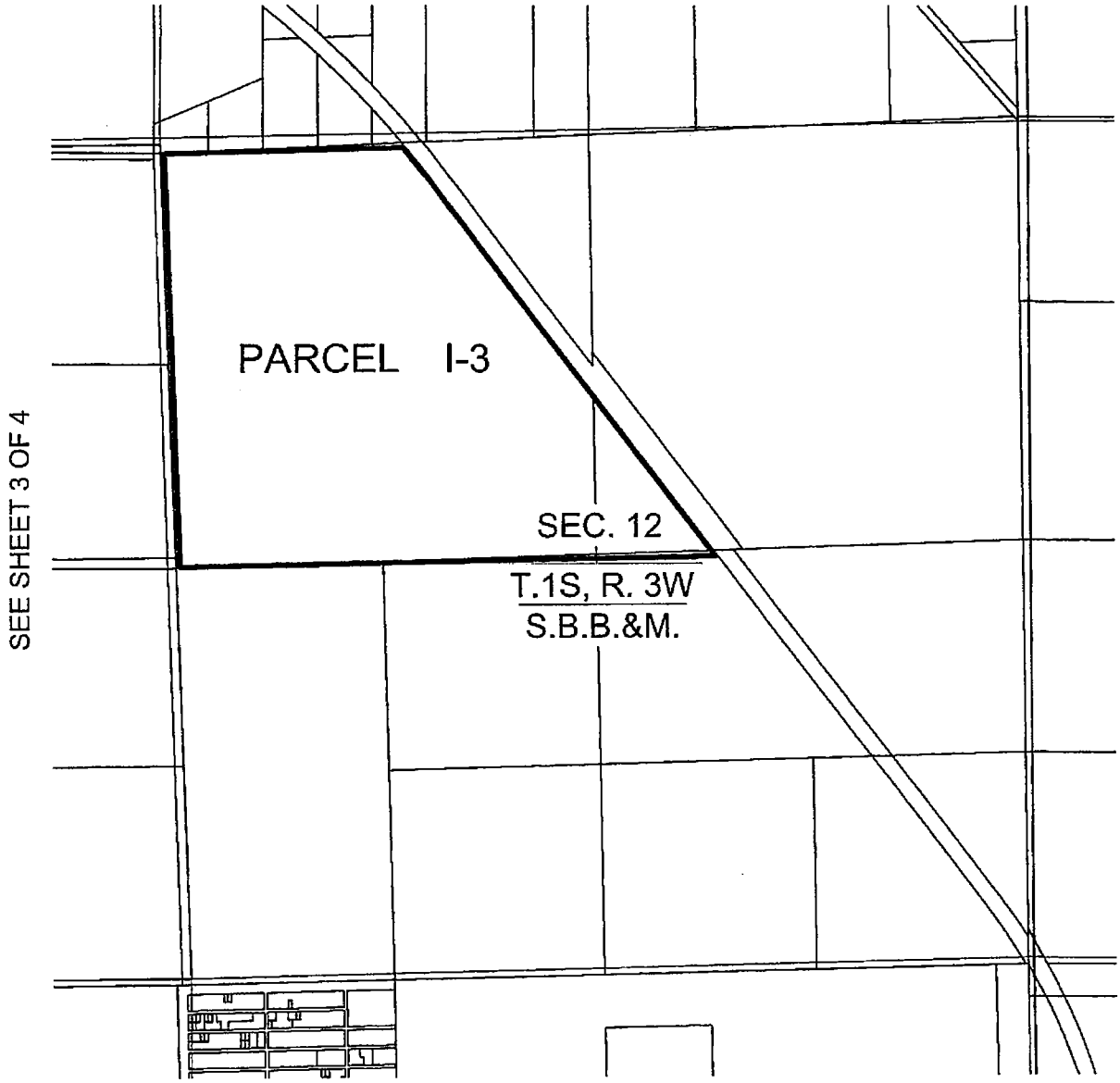
JOSEPH E. BONADIMAN & ASSOCIATES INC.
consulting engineers land surveyors
234 N. Arrowhead Ave., San Bernardino, CA. 92408
Phone: (909)885-3806 Fax: (909)381-1721

EXHIBIT "B"

(CONTINUED)

NOV. 15, 2011





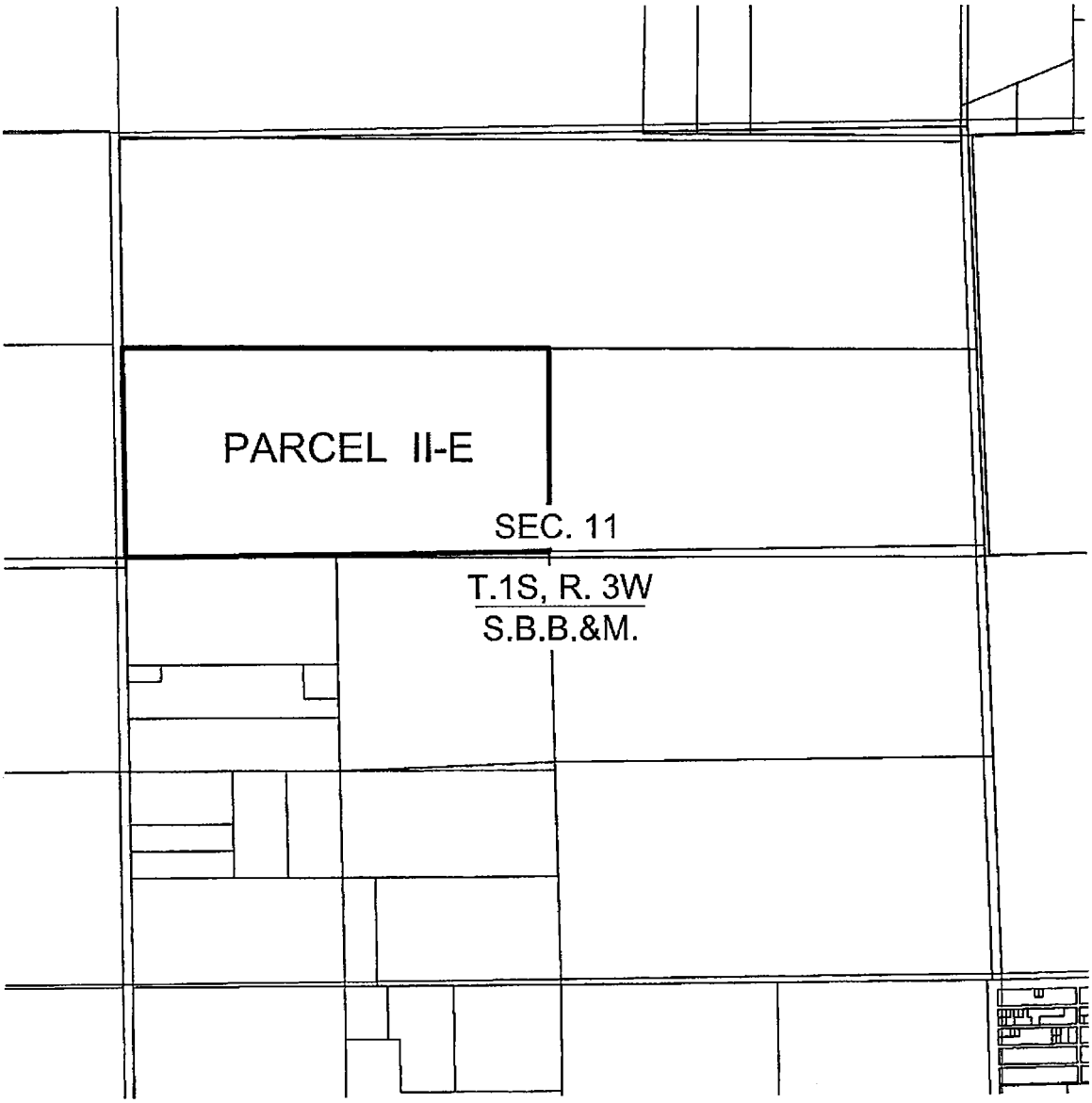
JOSEPH E. BONADIMAN & ASSOCIATES INC.
consulting engineers land surveyors

234 N. Arrowhead Ave., San Bernardino, CA. 92408
Phone: (909)885-3806 Fax: (909)381-1721

EXHIBIT "C"

"SILT DEPOSIT AREA"

NOV. 15, 2011



JOSEPH E. BONADIMAN & ASSOCIATES INC.
consulting engineers land surveyors

234 N. Arrowhead Ave., San Bernardino, CA. 92408
Phone: (909)885-3806 Fax: (909)381-1721

EXHIBIT "D"

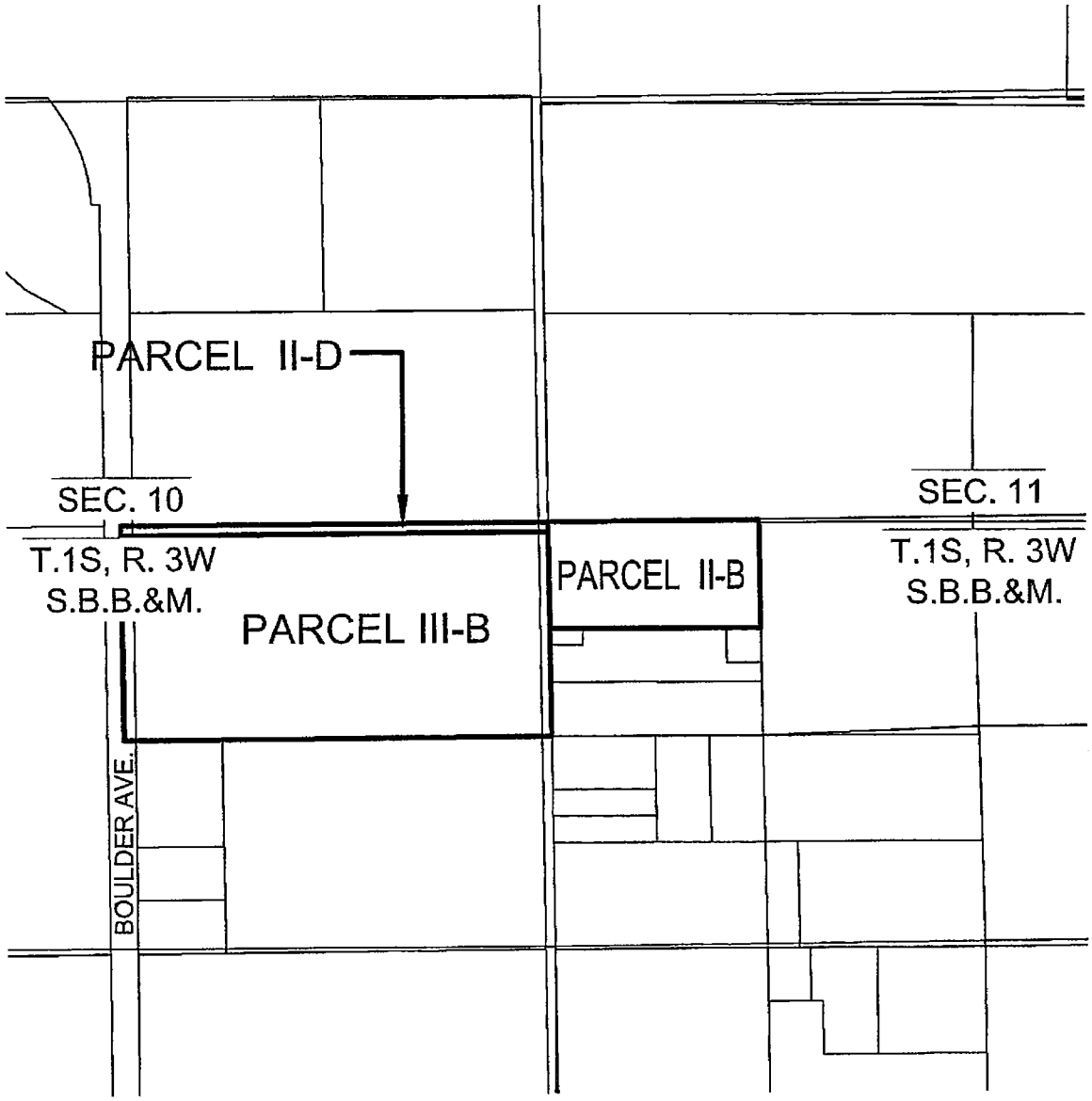
"ORANGE STREET PLANT SITE"

NOV. 15, 2011

NORTH

1000' 0' 1000'

SCALE: 1"=1000'



JOSEPH E. BONADIMAN & ASSOCIATES INC.
consulting engineers land surveyors

234 N. Arrowhead Ave., San Bernardino, CA. 92408
Phone: (909)885-3806 Fax: (909)381-1721

EXHIBIT "E"

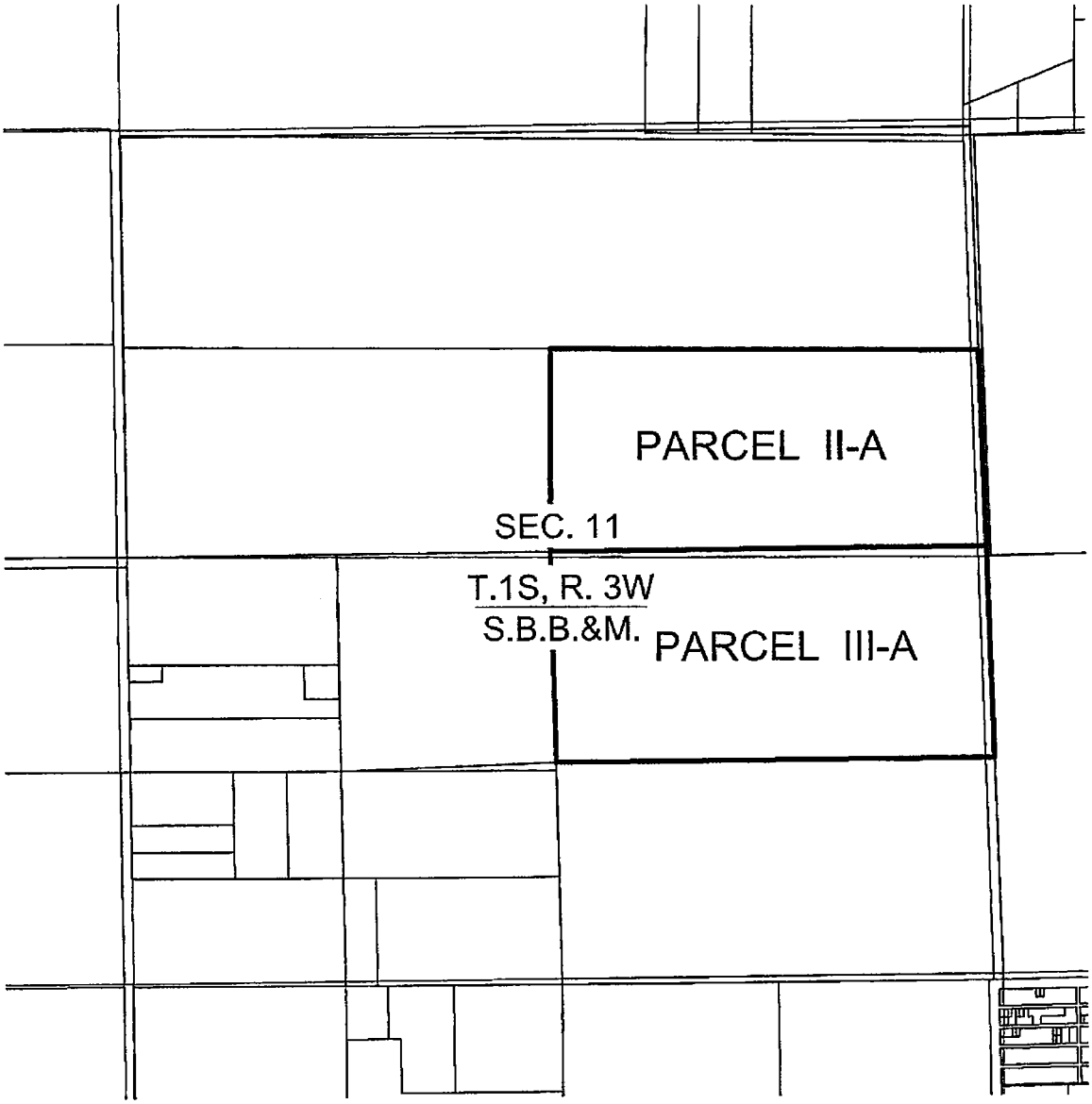
"REDLANDS AGGREGATES SITE"

NOV. 15, 2011

NORTH

1000' 0' 1000'

SCALE: 1"=1000'



JOSEPH E. BONADIMAN & ASSOCIATES INC.
consulting engineers land surveyors

234 N. Arrowhead Ave., San Bernardino, CA. 92408
Phone: (909)885-3806 Fax: (909)381-1721

Exhibit 4

Roberton's Ready Mix Lease

AGREEMENT

This Agreement is made on this 11th day of August, 2003, by and between San Bernardino Valley Water Conservation District ("District") and Robertson's Ready Mix, Ltd., ("Robertson's"), together "Parties" or individually, "Party".

RECITALS

A. District is a California water conservation district duly formed and operating under Sections 74000, et seq., of the California Water Code, and operating as a water conservation district, having as a purpose the recharge of ground water supply and maintenance of groundwater basins underlying its jurisdiction area.

B. Robertson's is a California limited partnership, duly formed and organized pursuant to the laws of the State of California, with its principal place of business in Corona, California. Robertson's engages in the business of excavating, processing, and selling rock, sand, gravel and other like substances ("Aggregates").

C. On or about October 5, 1992, the Parties entered into a Lease Agreement for Mineral Extractions ("Cone Camp Lease") pursuant to which Robertson's, on the satisfaction of certain conditions, would have the right to extract Aggregates from that property defined as the "Premises" in the Cone Camp Lease, and commonly referred to as "Cone Camp Quarry." A copy of the Cone Camp Lease is appended hereto, denoted Exhibit "A".

D. Some time in or about 1993, the Parties, together with other entities interested in mining, flood control, resource management and conservation, and municipalities, formed the Santa Ana River Wash Area Coordinated Planning Activities Committee ("Wash Committee") to address land use issues related to the Upper Santa Ana River Wash ("Wash").

E. The Wash Committee examined the most appropriate manner in which to use the Wash for the benefit of all landowners without regard to the existing interests in real property situated in the Wash. The Wash Committee determined that there should be a balance of land uses to accommodate the varied and competing concerns. The Wash Committee further determined that in order to achieve land use balance, the existing and potential uses must be reallocated among specific portions of the Wash.

F. Deliberations of the Wash Committee resulted in the drafting, circulation, and approval of a "Proposed Land Management and Habitat Conservation Plan for the Upper Santa Ana River Wash" ("Concept Plan"), which sets out concepts for realignment of mining, water conservation, recreation, habitat preservation, and other uses in the Santa Ana River Wash and was conceptually endorsed by all members of the Wash Committee, including the Parties. A copy of the Concept Plan as presently conceived is attached as Exhibit "B." This Concept Plan is subject to revision as the parties impacted continue to refine and negotiate its parameters. Implementation of the Concept Plan, as it may evolve over time, will require the formation of a Task Force, of which the Parties shall be members, to fund studies for environmental review of proposed mining, transfer of various property ownerships and lease interests, habitat conservation plans, recreational facilities, regional infrastructure, and water supply and conservation activities, and to implement such activities. A Task Force Agreement has been

prepared and circulated among applicable Wash Committee members, including the Parties, to guide and fund implementation of the Concept Plan. It has been reviewed and approved by the Parties, in the form attached hereto as Exhibit "C," and shall be executed by the Parties upon or prior to execution of this Agreement.

G. The Parties have found and determined that it is in their individual best interests to join together with other members of the Task Force to manage activities in connection with the planning, environmental review, and implementation of the Concept Plan (collectively the "Project").

H. The Cone Camp Lease requires that Robertson's "diligently and continuously take all actions necessary to obtain any and all licenses, permits, or other governmental entitlements.... required to accomplish the excavation purpose set out [therein]". There is currently pending before the city of Highland Robertson's application ("Cone Camp Application") for entitlements to mine Aggregates from the Cone Camp Quarry.

I. Robertson's has represented to the District that it has reached an agreement with Cemex Construction Materials, LP ("Cemex"), an entity engaged in business similar to that in which Robertson's is engaged, concerning the allocation, between Robertson's and Cemex, of the right to extract Aggregates from property which is contemplated for the excavation of Aggregates under the Concept Plan.

NOW, THEREFORE, IN CONSIDERATION OF THE MUTUAL COVENANTS CONTAINED HEREIN THE PARTIES AGREE AS FOLLOWS:

Section 1. Definitions.

In addition to capitalized terms defined elsewhere in this Agreement, the following terms shall be defined as follows:

1.1 "Effective Date" shall mean the date on which both Parties have executed the Task Force Agreement and this Agreement.

1.2 "Section," except as may be qualified to refer to the Cone Camp Lease, shall be deemed to be a reference to a portion of this Agreement.

1.3 "WPA" shall mean the Wash Planning Area, as that term is used and defined in the Concept Plan.

1.4 "Robertson's WPA Allocation" shall mean that portion of the WPA which is allocated, through written agreement between Robertson's and Cemex attached as Exhibit "D", to Robertson's for the mining of Aggregates. Robertson's agrees it must obtain approval from District for any substantial changes to this allocation prior to such changes being effective. Any change within the land acreage specifically dimensioned in Exhibit "D" as 1847' x 1303', that does not change the amount allocated to Robertson's for mining by more than 50% of the area of that dimensioned parcel, shall not constitute a substantial change; all other changes to the allocation agreement shall be considered substantial. The "Robertson's WPA Allocation" specifically excludes the real property located within the WPA and owned by Robertson's,

and/or its affiliate RRM Properties, Ltd., A California limited partnership, in fee as of the Effective Date.

1.5 "Premises Transfer Date" shall occur upon transfer of ownership of interest to the District of those portions of the WPA that fall within Robertson's WPA Allocation, and which, as of the date of this Agreement, are owned by the United States, through the Bureau of Land Management.

1.6 "Concept Plan Termination Date" shall mean any date prior to the Premises Transfer Date upon which either Party's participation in the Task Force Agreement shall have been finally terminated, as provided in Paragraph 23 of the Task Force Agreement, or upon dissolution of the Task Force pursuant to Paragraph 22 of the Task Force Agreement. Upon occurrence of the Premises Transfer Date, there shall be no Concept Plan Termination Date.

1.7 "Concept Plan Term" shall mean the period between the Effective Date and the occurrence of the earlier of the (1) Concept Plan Termination Date; or (2) Premises Transfer Date.

Section 2. Obligations During Concept Plan Term.

2.1 Prosecution of Concept Plan. The Parties, and each of them, agree that for so long as the Concept Plan, as may be modified consistent with the provisions of Section 2.3, below, but otherwise in substantially the same form as set forth in the Task Force Agreement, is being diligently and in good faith pursued, they will not, prior to January 1, 2006, terminate their participation under the Task Force Agreement pursuant to Paragraph 23 of the Task Force Agreement. Notwithstanding the foregoing, in the event that prior to January 1, 2006, Robertson's contribution to the total Task Force funding exceeds that required to be paid by CEMEX, or exceeds, by more than 0.25 percent of the total Task Force funding, that required to be paid by the District, Robertson's shall be free to exercise its rights of termination under Paragraph 23 of the Task Force Agreement. . During the Concept Plan Term each of the Parties shall use their best efforts to achieve the Premises Transfer Date; provided, however, that neither Party shall be considered to be in breach of this provision unless a party who believes that a breach has occurred first provides to the other Party written notice informing the notified Party of the specific nature of the alleged breach of this provision, the reasons therefore, the actions the notifying Party alleges must be taken to cure the alleged breach and provides to the noticed Party either, (a) reasonable opportunity to cure the breach, or (b) in the event the breach is of the nature that a cure cannot be promptly effected, reasonable opportunity to prepare and prosecute a plan pursuant to which the breach will be cured, or (c) in the event the alleged breach is one that cannot be cured, a good faith effort to meet and confer regarding whether mutually satisfactory alternative arrangements can be made. In the event of any dispute regarding either Party's alleged breach of this "best efforts" obligation, the matter shall be resolved through the binding arbitration mechanism set forth in Section 8.06 of the Cone Camp Lease.

2.2 Suspension of Robertson's Duty to Obtain Permits. During the Concept Plan Term, Robertson's obligations pursuant to paragraph 5.05 of the Cone Camp Lease, to diligently and continuously take all actions necessary to obtain any and all licenses, permits, or other governmental entitlements required to accomplish the excavation purpose set out in the Cone

Camp Lease, shall be suspended. Such suspension shall begin on the Effective Date and shall continue until the earlier occurrence of: A) the Premises Transfer Date or B) the Concept Plan Termination Date. Robertson's shall not pursue such licenses, permits, or other governmental entitlements for any excavation of any portion of the "Premises," as originally defined in the Cone Camp Lease, at any time during the Concept Plan Term.

2.3 District to Support Robertson's Attempt to Amend Concept Plan. Robertson's has advised District that during the Concept Plan Term, Robertson's will seek Task Force Approval to amend the present iteration of the Concept Plan, to expand the Concept Plan mining area to include additional property owned by Robertson's. District agrees that it will support Robertson's attempt to so amend the Concept Plan, provided it is consistent with District's water conservation and land management objectives.

2.4 Incorporation of Defined Terms into Cone Camp Lease. Beginning on the Effective Date hereof, the following terms, as they are defined herein, shall be deemed incorporated, as applicable, into the Cone Camp Lease: Premises Transfer Date, Concept Plan Term; Concept Plan Termination Date; Robertson's WPA Allocation; and Cone Camp Quarry.

Section 3. Rights and Obligations on Premises Transfer Date

3.1 Transfer of Premises. The Premises shall, upon the Premises Transfer Date, immediately and automatically be deemed to mean and refer to the Robertson's WPA Allocation and the Cone Camp Lease shall no longer apply to the Cone Camp Quarry. Upon the Premises Transfer Date, the parties shall prepare, and may record, such documents as may be necessary or appropriate to reflect the proper legal descriptions or other identification of the transferred Premises, but the transfer of the Premises from the area originally defined in the Cone Camp Lease to the Robertson's WPA Allocation shall not be conditioned or dependent upon such documentation, but rather shall occur immediately upon occurrence of the Premises Transfer Date.

3.2 Revival of Robertson's Duty to Obtain Permits on Premises Transfer Date. Immediately upon the Premises Transfer Date, Robertson's obligations pursuant to Section 5.05 of the Cone Camp Lease, to diligently and continuously take all actions necessary to obtain any and all licenses, permits, or other governmental entitlements required to accomplish the excavation purpose set out in the Cone Camp Lease, shall revive, and shall apply to the Robertson's WPA Allocation, as provided in Section 3.1 of this agreement.

3.3 Commencement Date on Premises Transfer Date. Immediately upon occurrence of the Premises Transfer Date, Section 1.01 of the Cone Camp Lease shall be automatically amended to read as follows:

> 1.01 Commencement Date. The Commencement Date of the Lease Term shall be the date sixty (60) days after occurrence of the Premises Transfer Date.

In applying the foregoing provision it is the intention of the Parties that in the event that Premises Transfer Date does not occur by January 1, 2007, the Cone Camp Lease shall not be terminated, but shall survive, subject to modification triggered by the happening of either Premises Transfer Date or Concept Plan Termination Date.

Section 4. Rights and Obligations on Concept Plan Termination Date.

4.1 Revival of Robertson's Duty to Obtain Permits on Concept Plan Termination Date. Immediately upon the Concept Plan Termination Date, Robertson's obligations pursuant to Section 5.05 (A) of the Cone Camp Lease, to diligently and continuously take all actions necessary to obtain any and all licenses, permits, or other governmental entitlements required to accomplish the excavation purpose set out in the Cone Camp Lease, shall revive.

4.2 Commencement Date on Concept Plan Termination Date. Immediately upon occurrence of the Concept Plan Termination Date, Section 1.01 of the Cone Camp Lease shall be amended to read as follows:

> 1.01 Commencement Date. The Commencement Date of the Lease Term shall, at Robertson's election, either be (x) the date sixty (60) days after the Concept Plan Termination Date, or (y) January 1, 2003, provided, however, that in no event shall District be required to refund any portion of the Phase I Payment before the expiration of one (1) full year following the date Robertson's provides to District written notice of its election hereunder. Robertson's election shall be made in writing and delivered to District prior to the 60th day following Concept Plan Termination Date.

In applying the foregoing provision it is the intention of the Parties that in the event that Concept Plan Termination Date does not occur by January 1, 2007, the Cone Camp Lease shall not be terminated, but shall survive, subject to modification triggered by the happening of either Premises Transfer Date or Concept Plan Termination Date.

Section 5. Mancino Property. Effective immediately upon the Effective Date, the original Cone Camp Lease shall be amended to exclude from the definition of "Premises" therein, all of the property more specifically described in Exhibit "E" hereto (the "Mancino Property").

Section 6. Waiver. Each of the Parties herein fully waives its right to claim that any act, omission, or inaction of the other Party, prior to the Effective Date, constituted: (a) a breach of any of the provisions of the Cone Camp Lease, or any obligation arising thereunder or in connection therewith, or (b) any basis for reformation or rescission of all or any part of the Cone Camp Lease, for which any relief, legal or equitable, and specifically, but not by way of limitation, monetary damages, were or could have been available, either as affirmative relief, or as an offset against any other claim. This waiver extends to all claims or causes of action, whether presently known or unknown, and in connection with such waiver, both parties specifically waive any operation or applicability of California Civil Code section 1542, which provides:

> "A general release does not extend to claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him must have materially affected his settlement with the debtor."

Each Party represents and warrants it has consulted with counsel regarding the nature and consequences of waiving the operation of Civil Code section 1542, and knowingly and willingly has decided to waive it.

Section 7. No Obligation on Robertson's to Transfer. Robertson's execution of this Agreement, its execution of the Task Fore Agreement, anything expressed or implied in either document, and/or its participation in advancing the Concept Plan, whether taken individually or collectively in any combination, shall not be construed or interpreted to require Robertson's to transfer, encumber or agree to any use restrictions being placed upon any real property Robertson's owns in fee on the Effective Date; or to cause any such real property be transferred, encumbered, or restricted as to use. Nothing in this Section 7 affects or relieves Robertson's obligation to transfer the Premises, as provided in section 3 above, however.

Section 8. Notices. All notices required to be provided hereunder, shall be in writing, and either served personally or sent by United States Mail. For these purposes, the addresses for the Parties are as follows:

As to Robertson's Ready Mix, Ltd.	As to District
President Robertson's Ready Mix, Ltd. 200 South Main Street Suite 200 Corona CA 92878	General Manager San Bernardino Valley Water Conservation District 1630 West Redland Blvd., Suite A Redlands CA 92373

Notices shall be deemed delivered on the date of personal service or on the third day following deposit in the United States Mail. Any Party may change the address or person to whom notices are to be directed hereunder, by written notice to the other Party.

Section 9. Entire Agreement. This Agreement, in connection with the unaffected portions of the original Cone Camp Lease, contains the entire agreement of the Parties hereto with respect to the matters contained herein and supersedes all negotiations, prior discussions, and preliminary agreements or understandings, written or oral. No waiver or modification of this Agreement shall be binding unless consented to by the Parties in writing.

Section 10. Cooperation; Further Acts. The Parties agree to use reasonable care and diligence to perform their respective obligations under this Agreement. The Parties agree to act in good faith to execute all instruments, prepare all documents, and take all actions as may be reasonably necessary, appropriate or convenient to carry out the purposes of this Agreement.

Section 11. Governing Law. This Agreement shall be governed by and construed under the laws of the State of California.

Section 12. Attorneys' Fees. In an action or proceeding involving a dispute between the Parties arising out of this Agreement, including arbitration, the prevailing Party shall be entitled to receive from the other Party, reasonable attorneys' fees. The term "attorneys' fees" shall include reasonable costs for investigating the action, conducting discovery, cost of appeal, costs

and fees for expert witnesses, and all other normally allowable costs incurred in such litigation, whether or not such litigation is prosecuted to final judgment.

Section 13. No Third Party Beneficiaries. There are no intended third party beneficiaries of any right or obligation assumed by the Parties.

Section 14. Construction: Captions. The language of this Agreement shall be construed according to its fair meaning, and not for or against any Party hereto based on authorship. The captions of the various articles and paragraphs are for convenience and ease of reference only, and do not define, limit, augment, or describe the scope, content, or intent of this Agreement.

Section 15. Severability. Each provision of this Agreement shall be severable from the whole. If any provision of this Agreement shall be found contrary to law, it is the intention of the Parties that the remainder of this Agreement shall continue in full force and effect.

Section 16. Incorporation of Recitals. The Recitals are incorporated herein and made an operative part of this Agreement.

Section 17. Authority to Enter into Agreement. The Parties warrant they have all requisite power and authority to execute and perform this Agreement. Each person executing this Agreement on behalf of their party warrants that he or she has the legal power, right, and authority to make this Agreement and bind his or her respective Party, and that in so doing, such Party is not thereby in breach of any other contract or agreement.

Section 18. Counterparts. This Agreement may be signed in counterparts, each of which shall constitute an original.

Section 19. Assignment. Neither Party shall assign its rights or delegate its responsibilities hereunder without the express written consent of the other Party, which consent shall not be unreasonably withheld. This Agreement, including the rights of first refusal and options granted hereunder, shall be binding on all successors and is intended to and shall run with the land.

Section 20. Recordation. Within fifteen (15) days of the Effective Date, the Parties shall have this Agreement recorded with the County Recorder for the County of San Bernardino, State of California.

ROBERTSON'S READY MIX, LTD.,
a California limited partnership
By: Robertson's Ready Mix, Ltd.
a California corporation
Its General Partner

By: _____
Dennis Troesh
Its: President

July 29, 2003

Date: 8/11/03

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT,
a political subdivision of the State of California

By: _____
Sterling Woodbury

Its: President of the Board of Directors

Date: 8/11/03

State of California)
) ss.
County of Riverside)

On July 29, 2003, ~~2003~~, before me Susan J. Howard, notary public, personally appeared Dennis Troesh, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted executed the instrument.

Witness my hand and official seal

Susan J Howard

SUSAN J. HOWARD
Commission # 1314530
Notary Public - California
Riverside County
My Comm. Expires Jul 20, 2005

State of California)
) ss.
County of Riverside)

On August 11, 2003, before me Colleen E. Theuer, notary public, personally appeared Sterling Woodbury, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted executed the instrument.

Witness my hand and official seal

Colleen E. Theuer

COLLEEN E. THEUER
Commission # 1262640
Notary Public - California
San Bernardino County
My Comm. Expires May 4, 2004

Exhibit List

Description	Designation:
Cone Camp Lease	A
Concept Plan	B
Task Force Agreement	C
Allocation Agreement Between Robertson's and Cemex	D
Legal Description of Portion of Mancino Property Excluded from "Premises" of Original Cone Camp Lease	E

Exhibit 5

2010 State Water Rights Filing

[FINAL SUBMITTED VERSION]

REPORT OF LICENSEE FOR 2010

Primary Owner: SAN BERNARDINO VALLEY W C D
Application Number: A002217
License Number: 002831

Compliance with License Terms and Conditions	
The project has been abandoned and I request revocation of my water right license	No
I have reviewed my water right license	Yes
I am complying with all terms and conditions	Yes
Description of noncompliance with terms and conditions	
Intake location has been changed	
Description of intake location changes	
Type of use has changed	
Description of type of use changes	
Place of use has changed	
Description of place of use changes	

Purpose of Use	
Other	Groundwater Recharge

Month	Amount directly diverted or collected to storage (Acre-Feet)	Amount used (Acre-Feet)
January	241.0	0.0
February	285.0	0.0
March	1412.0	0.0
April	1977.0	0.0
May	1756.0	0.0
June	0.0	0.0
July	0.0	0.0
August	0.0	0.0
September	0.0	0.0
October	0.0	0.0
November	0.0	0.0
December	0.0	0.0
Total	5671	0

Month	Maximum Rate of Diversion (CFS)
January	
February	
March	
April	
May	

June	
July	
August	
September	
October	
November	
December	

Reservoir name	Spilled this year	Feet below spillway at maximum storage	Completely emptied	Feet below spillway at minimum storage	Method used to measure water level
NA	No	0.0	No	0.0	NA

Conservation of Water	
Are you now employing water conservation efforts?	Yes
Description of water conservation efforts	Cooperative Water Recharge for Basin
Amount of water conserved	5671.0 Acre-Feet

Water Quality and Wastewater Reclamation	
During the period covered by this Report, did you use reclaimed water from a wastewater treatment facility, water from a desalination facility, or water polluted by waste to a degree which unreasonably affects the water for other beneficial uses?	No
Amount of reclaimed, desalinated, or polluted water used	

Conjuctive Use of Groundwater and Surface Water	
During the period covered by this Report, were you using groundwater in lieu of available surface water authorized under your license?	No
Amounts of groundwater used	

Additional Remarks
Maximum Rate of Diversion not recorded for 2010 Cooperative Recharge with the Region's water entities occurs additional explanation is shown in the attached file.

Attachments	
File Name	Size
Water Rights Filing Explanaiton Final June 27 2011.pdf	13 KB

Contact Information of the Person Submitting the Form	
First Name	Daniel
Last Name	Cozad
Relation to Water Right	Authorized Official
I read the above and agree	Yes

[FINAL SUBMITTED VERSION]

REPORT OF LICENSEE FOR 2010

Primary Owner: SAN BERNARDINO VALLEY W C D
Application Number: A004807
License Number: 002832

Compliance with License Terms and Conditions	
The project has been abandoned and I request revocation of my water right license	No
I have reviewed my water right license	Yes
I am complying with all terms and conditions	Yes
Description of noncompliance with terms and conditions	
Intake location has been changed	
Description of intake location changes	
Type of use has changed	
Description of type of use changes	
Place of use has changed	
Description of place of use changes	

Purpose of Use	
Other	GROUND WATER RECHARGE

Month	Amount directly diverted or collected to storage (Acre-Feet)	Amount used (Acre-Feet)
January	0.0	0.0
February	0.0	0.0
March	0.0	0.0
April	0.0	0.0
May	0.0	0.0
June	0.0	0.0
July	0.0	0.0
August	0.0	0.0
September	0.0	0.0
October	39.0	39.0
November	0.0	0.0
December	268.0	268.0
Total	307	307

Month	Maximum Rate of Diversion (CFS)
January	0.0
February	0.0
March	0.0
April	0.0
May	0.0

June	0.0
July	0.0
August	0.0
September	0.0
October	0.0
November	0.0
December	0.0

Reservoir name	Spilled this year	Feet below spillway at maximum storage	Completely emptied	Feet below spillway at minimum storage	Method used to measure water level
ASDF	No	0.0	Yes		STICK

Conservation of Water	
Are you now employing water conservation efforts?	Yes
Description of water conservation efforts	Cooperative Groundwater Management with Regional Agencies.
Amount of water conserved	307.0 Acre-Feet

Water Quality and Wastewater Reclamation	
During the period covered by this Report, did you use reclaimed water from a wastewater treatment facility, water from a desalination facility, or water polluted by waste to a degree which unreasonably affects the water for other beneficial uses?	No
Amount of reclaimed, desalinated, or polluted water used	

Conjuctive Use of Groundwater and Surface Water	
During the period covered by this Report, were you using groundwater in lieu of available surface water authorized under your license?	No
Amounts of groundwater used	

Additional Remarks
Maximum Rate of Diversion not recorded for 2010 Cooperative Recharge with the Region's water entities occurs additional explanation is shown in the attached file.

Attachments	
File Name	Size
Water Rights Filing Explanaiton Final June 27 2011.pdf	13 KB

Contact Information of the Person Submitting the Form	
First Name	Daniel
Last Name	Cozad
Relation to Water Right	Authorized Official
I read the above and agree	Yes

SWRCB Annual Water Rights Report

Annotation to Accompany Filings by SBVWCD and SBVMWD/WMWD

During 2010, the San Bernardino Valley Water Conservation District (SBVWCD) and San Bernardino Valley Municipal Water District (SBVMWD)/Western Municipal Water District (WMWD) diverted water at the Cuttle Weir to replenish the groundwater basin. Each agency's season of diversion, total quantity of diversion and water rights are listed in the following table.

Agency	Season of Diversion	Total Quantity of Water Diverted	Water Right
SBVWCD	1/1/10 to 5/31/10	5,671 af	License No. 2831
SBVMWD/WMWD	6/29/10 to 12/31/10*	14,934 af	Permit No. 21264
SBVWCD	10/1/10 to 12/31/10	307 af	License No. 2832

* The State Water Resources Control Board issued Permit No. 21264 on June 29, 2010.

Diversion of approximately 882 acre feet to replenish the groundwater basin were shifted outside the Season of Diversion due to operations of the Seven Oaks Dam by the USACOE and are not being accounted for in this table. Such diversions occurred under water rights, jointly utilized under the Santa Ana River and Mill Creek Cooperative Water Project.

Additionally, SBVMWD/WMWD and SVBWCD are finalizing negotiations to expand our contractual relationships to cooperatively utilize and expand District facilities to maximize the water diverted for recharge jointly under these permits and licenses. Notwithstanding our intentions, should these negotiations for cooperative agreement not be fruitful, both districts may need to revise their filings.

AGREEMENT FOR THE COOPERATIVE USE OF UNUSED WELL CAPACITY, THE TEXAS GROVE RESERVOIR AND THE CENTRAL FEEDER

This Agreement for the Cooperative Use of Unused Well Capacity, the Texas Grove Reservoir and the Central Feeder ("Agreement") is entered into and effective this 2nd day of April , 2013 ("Effective Date") by and between the City of Redlands ("City") and San Bernardino Valley Municipal Water District ("Valley District"). City and Valley District are sometimes individually referred to herein as a "Party" and, together, as the "Parties."

Recitals

A. City owns the 3.9 million gallon Texas Grove Reservoir, which is shown on the map attached hereto as Exhibit "A" and incorporated herein by reference. The Texas Grove Reservoir is located adjacent to the Valley District Redlands Pump Station.

B. Valley District desires to purchase 2.3 million gallons of capacity in the existing City of Redlands' Texas Grove Reservoir which is already intertied with the Valley District Central Feeder system.

C. City is willing to sell Valley District 2.3 million gallons of capacity in the Texas Grove Reservoir.

D. City owns various water wells that deliver water to the Texas Grove Reservoir.

E. Valley District has constructed the Central Feeder Project Phase 1, which includes the Redlands Pump Station and a 78-inch pipeline (the "**Central Feeder**") that connects to the Metropolitan Water District of Southern California's Inland Feeder Pipeline and the East Branch Extension of the State Water Project. The Central Feeder is shown on the map attached hereto as Exhibit "A." Valley District further intends to construct new wells in the San Bernardino Basin Area (the "**SBBA**"), in, or upstream of, the Area of Historic High Groundwater (the "**AHHG**" or the "**Pressure Zone**") that could deliver water to the Central Feeder.

F. From time to time, Valley District intends to use its proposed wells to dewater the AHHG during periods when the Boards of Directors for Valley District and Western Municipal Water District (**"Western"**) agree additional extractions are needed to mitigate the risks associated with high groundwater which include the flooding of basements and the increased risk of property damage and personal injury from soil liquefaction during an earthquake. These Valley District wells may also be used to extract: (i) State Water Project water that has been "banked" in the SBBA, (ii) Western's portion of Santa Ana River water diverted and stored in the SBBA under State Water Resources Control Board permits 21264 and 21265, or (iii) "new conservation water," as defined in the *Western* Judgment (*Western Municipal Water District et al. v. East San Bernardino County Water District et al.*, Riverside County

Superior Court Case No. 78426, April 17, 1969) and determined by the Western-San Bernardino Watermaster that is banked in the SBBA. Additionally, Valley District intends to consult with other water agencies with interests in the SBBA, by working with the Basin Technical Advisory Committee, in order to ensure Valley District and Western Boards of Directors are provided with the most up-to-date technical information upon which to base decisions.

G. To postpone the need to construct its own wells and related transmission pipelines, Valley District desires to utilize the City's water wells when the City is not using such wells (unused capacity) to pump and deliver water to the Central Feeder via the Texas Grove Reservoir and Redlands Pump Station.

H. City wishes to make its unused water well capacity available to Valley District provided that it does not cause lower water levels and, thereby, increase pumping costs for City's own customers nor cause water quality degradation for Total Dissolved Solids ("**TDS**") in the SBBA that causes Redlands Wastewater Treatment Plant discharges to exceed permitted concentrations.

I. City and Valley District, in addition to other parties, entered into the "Settlement Agreement Relating to the Diversion of Water From the Santa Ana River System (the "**Seven Oaks Accord**")" on July 21, 2004. One of the provisions of the Seven Oaks Accord provides for participation in a "groundwater spreading program" that would, among other things, maintain groundwater levels at relatively constant levels in the SBBA.

J. Valley District and the Santa Ana Regional Water Quality Control Board entered into the "Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin" (the "**RWQCB Agreement**") on January 16, 2008, which requires preparation of a report on water quality conditions in the SBBA every three years.

K. City and Valley District wish to cooperate in the operation of facilities for the mutual benefit of the Parties.

Agreements

1. *Valley District Purchase of Storage Rights in the Texas Grove Reservoir*

   a. *Storage Rights.* City hereby sells, and Valley District hereby purchases, all rights to the use of the upper 2.3 million gallons of usable storage capacity in the existing Texas Grove Reservoir, for the life of the reservoir, which capacity is understood by the Parties to be at, or above, elevation 1338.9 feet MSL NGVD. City shall retain all storage rights to the use of that portion of the Texas Grove Reservoir below elevation 1338.9 feet MSL NGVD. Neither Party shall interfere

with the other Party's use of its share of the storage capacity of the Texas Grove Reservoir, unless such storage capacity is needed to meet fire fighting demands by City. In such instances, City shall have the right to use all water available in the Texas Grove Reservoir. City shall cooperate with Valley District and allow Valley District to construct City-approved facilities necessary to utilize Valley District's full storage rights in the Texas Grove Reservoir.

b. *Payment by Valley District for Storage Rights.* Valley District shall pay City the sum of $2,168,426 for the rights described in paragraph 1a within 30 calendar days after the Effective Date of this Agreement. Valley District will make such payment by electronic funds transfer into a fund approved by City. City shall provide Valley District with a written receipt, acknowledging payment in full, within 7 calendar days of the electronic funds transfer.

c. *Operation and Maintenance.* City shall be responsible for the day to day operation and maintenance of the Texas Grove Reservoir, except for the 42-inch nozzle connecting the Texas Grove Reservoir to Valley District's Redlands Pump Station which shall be the responsibility of Valley District.

(1) *Ordinary Operation and Maintenance.* City shall operate the Texas Grove Reservoir in accordance with the terms of this Agreement and in accordance with good engineering practices, including normal maintenance of the reservoir.

(2) *Substantial Work.* In the event City determines, in its reasonable engineering judgment, that substantial work (i.e., more than $50,000 in a calendar year) is needed to properly maintain the Texas Grove Reservoir, City shall promptly consult with Valley District and, before commencing any work, City shall give written notice to Valley District of: (i) the work to be performed, (ii) the estimated cost of the proposed work, and (iii) the contractor(s) that will perform work. City may only commence such work upon receipt of written approval from Valley District, which approval shall not be unreasonably withheld or delayed.

(3) *Emergency Circumstances.* Nothing in paragraph 1c(2) shall be construed to prevent City from taking any action it reasonably believes necessary in the event of an emergency. City shall notify Valley District of the existence of an emergency as soon as reasonably possible and shall, to the extent feasible under the circumstances, coordinate a response with Valley District.

(4) *Reimbursement by Valley District.* Valley District shall reimburse City for 63% of the costs to operate and maintain the Texas Grove Reservoir, as determined based on the calculations attached hereto as Exhibit "B" and

entitled "City of Redlands Reservoir #1 (Texas Grove Reservoir)." Reimbursable costs shall include, but not be limited to, actual and reasonable costs of City staff, consultants and contractors for operating and maintaining the Texas Grove Reservoir.

(5) *Invoices to Valley District.* City shall invoice Valley District for such operation and maintenance costs quarterly in arrears and Valley District shall pay such invoices within 30 calendar days of the date of the invoice. Invoices shall indicate, in reasonable detail, the cost of each action undertaken by City to operate and maintain the Texas Grove Reservoir, including the date of the service, the individuals performing the service, the hourly rate of such individuals, and the costs of any materials. In the event Valley District objects to any costs identified on an invoice, Valley District shall pay the undisputed costs and shall invoke the dispute resolution process described in paragraph 10c below for the objectionable costs.

2. *Term of Agreement.* This Agreement shall have an initial term of five years from its Effective Date and shall automatically renew for subsequent five-year terms thereafter unless terminated as provided for in paragraph 8 below.

3. *Cooperative Operation of City Wells and the Central Feeder*

a. *Delivery of Water by City to Valley District.*

(1) *Estimate of unused capacity by City.* No later than each November 1, City shall provide Valley District with a written estimate of the availability of water during the following calendar year, up to a maximum of 20,000 acre-feet. City shall make this estimate in its sole and reasonable discretion. City may base its estimate on hydrologic conditions, groundwater levels, facility limitations, demand for water within City, or any other reasonable factor.

(2) *Valley District Water Order.* No later than each December 1 of each year, Valley District shall provide City with a written order for water for the following calendar year, up to a maximum amount equal to City's estimate of unused capacity.

(3) *Water delivery to Texas Grove Reservoir.* City shall operate its water production and distribution systems to provide Valley District with the amount of water ordered by Valley District at the Texas Grove Reservoir. Valley District shall install or cause to be installed a meter to measure deliveries by City to Valley District. City shall have the right to read the

meter on a monthly basis and inspect the meter at least annually in order to ensure the accurate calculation of water delivered to Valley District.

(4) *Modification of City's Estimate.* The Parties understand and acknowledge that a number of factors, including but not limited to greater/lesser precipitation or changes in customer demand for water, may modify City's ability to supply Valley District with ordered water. It is the intent of the Parties that this Agreement not interfere with City's obligation to serve its customers.

(a) City may increase or decrease its estimate of water available to Valley District at any time during a calendar year as may be reasonable to provide water service to City's customers. City will use reasonable, good faith efforts to meet Valley District's water demands.

(b) In the event of an emergency, as defined in California Public Contract Code Section 1102, City may take any actions it deems reasonably necessary to respond to the emergency and provide water service to its customers. City shall promptly consult with Valley District and jointly develop a plan that will provide Valley District water as soon as practicable after the conclusion of the emergency.

b. *Payment by Valley District for Water.* Valley District shall pay City the actual production cost, as determined pursuant to paragraph 3b(1) below, and the Operations, Maintenance and Repair ("**OMR**") cost, as determined pursuant to paragraph 3b(2) below, for water delivered to Valley District at the Texas Grove Reservoir.

(1) *Payment for Production Cost.* Valley District shall pay City for City's actual cost of producing water pursuant to this Agreement. Such actual costs may be determined by using either: (i) energy and treatment costs for the water production facilities that City specifically operates to meet Valley District's water order or (ii) a weighted average cost of energy and treatment for all City facilities producing water during a period in which City delivers water to Valley District. City shall determine, and notify Valley District in writing, which method will be used to determine the actual cost of producing water for Valley District prior to delivery of water to Valley District. Absent notification, the Parties shall use method (ii) above until notice is given.

(2) *Payment for OMR Cost.* Valley District shall pay City's actual costs to operate, maintain and repair its water production and distribution facilities

(including, without limitation, production wells, booster pumps, treatment facilities, etc.) for the benefit of Valley District. Specifically, Valley District shall pay all costs, including staff time, associated with City's operation of its water production and distribution facilities to deliver water to Valley District. In addition, Valley District shall pay its fair share of City's costs to maintain and repair its water production and distribution facilities. This cost shall be equal to the City's actual per acre-foot cost for maintenance and repair of its water production and distribution facilities over the preceding three calendar years, multiplied by the number of acre-feet ordered by Valley District.

(3) *Invoices to Valley District.*

(a) *Production Cost Invoices.* City shall invoice Valley District for production costs at least quarterly in arrears and Valley District shall pay such invoices within 30 calendar days of the date of the invoice. Invoices shall indicate, method used to determine production costs as described in paragraph 3b(1), facilities used to provide Valley District water, and cost for chemicals and power used. In the event Valley District objects to any costs identified on an invoice, Valley District shall pay the undisputed costs and shall invoke the dispute resolution process described in paragraph 10c below for the objectionable costs.

(b) *OMR Cost Invoices.* City shall invoice Valley District for OMR costs at least quarterly in arrears and Valley District shall pay such invoices within 30 calendar days of the date of the invoice. Invoices shall indicate, in reasonable detail, the information necessary to calculate costs as described in paragraph 3b(2). For expenses and work outside of what should normally be expected, City shall identify expenses and/or work performed and include date expense was made or work was performed, facilities involved, the individuals or company performing the service, hourly rate of such individuals or company, and costs of any materials or service using the methodology provided on Exhibit "C." In the event Valley District objects to any costs identified on an invoice, Valley District shall pay the undisputed costs and shall invoke the dispute resolution process described in paragraph 10c below for the objectionable costs.

c. *Water Quality Reporting.* The City shall provide Valley District with copies of all reports submitted to the Santa Ana Regional Quality Control Board.

d. *Future Actions.* The Parties understand and acknowledge that this Agreement is intended not only to serve as the basis for cooperative operations beginning in 2013, but is also intended to serve as the basis for long-term cooperation. The Parties agree they will consider amending this Agreement at appropriate times to reflect additional facilities and new opportunities to improve the conjunctive management of the SBBA and/or water supply reliability for the San Bernardino Valley.

4. *Water Level and Water Quality Monitoring.* The Parties shall cooperate in monitoring water levels and water quality to ensure that the terms of this Agreement do not have an adverse impact on water levels or water quality in the SBBA.

a. The Parties shall monitor water levels using the Basin Technical Advisory Committee annual Regional Water Management Plan and/or, independently, to ensure compliance with the water level requirements of the Seven Oaks Accord.

b. The Parties agree to monitor any water quality impacts to Total Dissolved Solids ("**TDS**") using data provided in the triennial report prepared for the Santa Ana Regional Water Quality Control Board pursuant to the Santa Ana Regional Water Quality Control Board Agreement.

5. *Impacts to Water Levels.* If it is determined by the Parties that the water level requirements in the Seven Oaks Accord are not being met, Valley District will take one of the following actions:

a. *Stop taking deliveries.* Valley District will cease to water through City facilities until water levels are in compliance with the requirements of the Seven Oaks Accord.

b. *Deliver Exchange Water to City.* To offset the pumping costs associated with lower water levels, Valley District will provide water to City, on a 1:1 basis ("**Exchange Water**"), for deliveries made to Valley District after water levels are determined to be out of compliance with the Seven Oaks Accord and up until the point water levels are determined to be in compliance with the Seven Oaks Accord.

(1) *Sources of Exchange Water.* Valley District may obtain such Exchange Water from the State Water Project, from the Santa Ana River, from Mill Creek, from sources outside the SBBA or from "new conservation" as that term is defined in the *Western* Judgment (*Western Municipal Water District et al. v. East San Bernardino County Water District et al.* (Riverside County Superior Court No. 78426, April 17, 1969). The selection of sources of Exchange Water shall be within the sole discretion of Valley District but water diverted from the Santa Ana River shall not

comprise more than 50% of the Exchange Water delivered to City during any three-year reporting period, as defined in paragraph 4a below.

(2) *Delivery of Exchange Water.* Valley District shall deliver Exchange Water to City as soon as feasible but no later than three calendar years after the calendar year in which City delivered water to Valley District. Valley District shall deliver Exchange Water to one or more of the following agreed upon locations:

(a) San Bernardino Valley Water Conservation District Mill Creek Spreading Grounds;

(b) San Bernardino Valley Water Conservation District Santa Ana River Spreading Grounds;

(c) Bear Valley Mutual Water Company Airport Spreading Grounds;

(d) City's San Bernardino Avenue Spreading Grounds (formerly Bear Valley Mutual Water Company Judson Ponds);

(e) Such other spreading grounds that directly benefit City's wells and other wells in the surrounding area, as the Parties may determine through mutual consent in the future.

Valley District shall calculate and document deliveries of Exchange Water to City at the above locations in a manner that both Parties agree to be reasonable, recognizing that several of the above locations are owned by non-parties to this Agreement.

In the event Valley District is unable to deliver Exchange Water to City within a three consecutive calendar year time period, Valley District shall increase the amount of Exchange Water delivered to City by 5% of the overdue balance for every calendar year beyond the three calendar years allowed until the Exchange Water is delivered. The Parties shall use a "first-in, first-out" accounting to track Exchange Water for multiple years.

(3) *In-Lieu Recharge.*

(a) In the event spreading of Exchange Water is not prudent: (i) due to high groundwater conditions in the pressure zone, (ii) because such spreading would have adverse impacts on groundwater contaminants, or (iii) because City determines it would be beneficial for City to take deliveries of Exchange Water at a water treatment plant in lieu of the spreading grounds identified in

paragraph 5b(2), City may take deliveries of up to 50% of Exchange Water at its Horace Hinckley Surface Water Treatment Plant or Henry Tate Surface Water Treatment Plant, at its sole discretion. Valley District shall deliver the remaining Exchange Water to such locations that Valley District, in its sole discretion, determines appropriate for sound management of the SBBA.

(b) If City chooses to take delivery of Exchange Water at the Henry Tate Surface Water Treatment Plant, City may receive up to 10% of the total Exchange Water delivered in a calendar year at Henry Tate Surface Water Treatment Plant at no cost to the City.

6. *Impacts to Water Quality.* If it is determined by the Parties that pumping by City for delivery to Valley District, under the terms of this Agreement, is the sole cause for the City violating one or more of its permits from the Santa Ana Regional Water Quality Control Board, Valley District will take one of the following actions:

a. *Stop taking deliveries.* Valley District will cease to water through City facilities until water levels are in compliance with the Seven Oaks Accord.

b. *Recharge high quality water.* Valley District will recharge lower TDS water in a mutually agreeable locations until TDS has returned to acceptable levels.

c. *Any combination.* Valley District may use one, or both, of the above, at its discretion, to reduce the TDS level until the TDS has returned to mutually agreed upon acceptable levels.

d. *Violation of Santa Ana Regional Water Quality Control Board TDS discharge limit on Redlands wastewater plant.* In the event the Santa Ana Regional Water Quality Control Board orders City to remedy an increase in the TDS limit for City's wastewater treatment plant that the Parties agree has been caused by conditions derived by the activities associated with this Agreement, Valley District shall take any or all of the actions identified in subparagraphs a-c above until water quality has returned to acceptable levels. Additionally, Valley District and City will work together to resolve the condition with the Santa Ana Regional Water Quality Control Board identify a solution to the condition, and fund an appropriate solution.

7. *Natural Disaster or Civil Unrest.* In the event that the Texas Grove Reservoir suffers from substantial damage due to natural disaster (e.g., earthquake, flooding or otherwise) or due to civil unrest (e.g., rioting, terrorist attack, or otherwise), neither Party shall be obliged to rebuild/reconstruct the Texas Grove Reservoir in its current configuration or to its current capacity. Instead, the Parties shall promptly meet and confer, determine a rebuilding plan/configuration that is reasonable and financially feasible under the

circumstances at the time, and then rebuild/reconstruct the Texas Grove Reservoir as quickly as practicable.

8. *Termination of Agreement.* Either Party may terminate this Agreement, with or without cause, by providing written notice of termination to the other Party at least one year prior to the conclusion of the then-current term of this Agreement. Valley District's purchase of storage rights at, or above, elevation 1338.9 feet MSL NGVD shall survive termination of this Agreement and, after termination, Valley District may use its storage rights by supplying water available to Valley District from any source. In the event that Valley District has not completed its delivery of Exchange Water to City as required by paragraph 5b above, that obligation shall survive any termination of this Agreement.

9. *Indemnification.* Each Party shall defend and indemnify the other Party and the other Party's elected officials, officers, employees, agents and authorized volunteers from and against all claims, demands, or liability for damages arising out of the Party's performance of the terms of this Agreement where such liability is caused or claimed or alleged to be caused by the willful misconduct, sole negligence or active negligence of the Party or any person or organization for whom or which the Party is legally liable.

   In particular, Valley District shall defend and indemnify City's elected officials, officers, employees, agents and authorized volunteers for any and all claims, demands or liability arising from: (i) Valley District or its contractors' construction of the Central Feeder; (ii) the movement of groundwater contaminants due to the spreading of Exchange Water by Valley District and increased pumping; or (iii) a reduction in static groundwater levels due to extraction of water by City for delivery to Valley District.

   The provisions of this Section 9 shall survive any termination of this Agreement.

10. *Administration of Agreement*

   a. *Workers' Compensation.* Each Party certifies that it is aware of the provisions of section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code and each Party shall comply with such provisions before commencing the performance of any work under this Agreement. Each Party and any contractors or subcontractors shall keep workers' compensation insurance for their employees in effect during all work covered by this Agreement. Upon request, each Party shall provide the other with the certificate required by Labor Code section 3700.

   b. *Books and Records.* Each Party shall have access to and the right to examine the other Party's pertinent books, documents, papers or other records (including, without limitation, records contained on electronic media) relating to the performance of that Party's obligations pursuant to this Agreement. The Parties

shall each retain all such books, documents, papers or other records to facilitate such review. Access to each Party's books and records shall be during normal business hours only. Nothing in this paragraph shall be construed to operate as a waiver of any applicable privileges.

c. *Disputes*. The Parties recognize there may be disputes regarding the obligations of the Parties or the interpretation of this Agreement. The Parties agree they may attempt to resolve disputes as follows:

(1) *Statement Describing Alleged Violation of Agreement.* A Party alleging a violation of this Agreement (the "**Initiating Party**") shall provide a written statement describing all facts it believes constitute a violation of this Agreement to the Party alleged to have violated the terms of this Agreement (the "**Responding Party**").

(2) *Response to Statement of Alleged Violation.* The Responding Party shall have sixty calendar days from the date of the written statement to prepare a written response to the allegation of a violation of this Agreement and serve that response on the Initiating Party or to cure the alleged violation to the reasonable satisfaction of the Initiating Party. The Initiating Party and the Responding Party shall then meet within thirty calendar days of the date of the response to attempt to resolve the dispute amicably.

(3) *Mediation of Dispute.* If the Initiating Party and the Responding Party cannot resolve the dispute within ninety calendar days of the date of the written response, they shall engage a mediator, experienced in water-related disputes, to attempt to resolve the dispute. Each Party shall ensure that it is represented at the mediation by an employee of such Party. These representatives of the Initiating Party and the Responding Party may consult with staff and/or technical consultants during the mediation and such staff and/or technical consultants may be present during the mediation. The costs of the mediator shall be borne by the unsuccessful Party.

(4) *Reservation of Rights.* Nothing in this paragraph 10c shall require a Party to comply with the dispute resolution process contained herein, and each Party retains and may exercise at any time all legal and equitable rights and remedies it may have to enforce the terms of this Agreement.

11. *CEQA Compliance.*

The Parties have determined that, because the activities contemplated under the terms of this Agreement involve the cooperative use of existing facilities within the capacity of those

facilities and within the limits established by existing regulations, the implementation of this Agreement is exempt from environmental review pursuant to Title 14, section 15301 of the Code of California Regulations. Within five business days of the Effective Date of this Agreement, the Parties will file a Notice of Exemption with the County Clerk for the County of San Bernardino, which Notice is attached hereto as Exhibit "D" and incorporated herein by reference.

12. *General Provisions.*

a. *Authority.* Each signatory of this Agreement represents that he is authorized to execute this Agreement on behalf of the Party for which he signs. Each Party represents that it has legal authority to enter into this Agreement and to perform all obligations under this Agreement.

b. *Amendment.* This Agreement may be amended or modified only by a written instrument executed by each of the Parties to this Agreement.

c. *Jurisdiction and Venue.* This Agreement shall be governed by and construed in accordance with the laws of the state of California, except for its conflicts of law rules. Any suit, action, or proceeding brought under the scope of this Agreement shall be brought and maintained to the extent allowed by law in the County of San Bernardino, California.

d. *Headings.* The paragraph headings used in this Agreement are intended for convenience only and shall not be used in interpreting this Agreement or in determining any of the rights or obligations of the Parties to this Agreement.

e. *Construction and Interpretation.* This Agreement has been arrived at through negotiations and each Party has had a full and fair opportunity to revise the terms of this Agreement. As a result, the normal rule of construction that any ambiguities are to be resolved against the drafting Party shall not apply in the construction or interpretation of this Agreement.

f. *Entire Agreement.* This Agreement constitutes the entire agreement of the Parties with respect to the subject matter of this Agreement and supersedes any prior oral or written agreement, understanding, or representation relating to the subject matter of this Agreement.

g. *Partial Invalidity.* If, after the Effective Date of this Agreement, any provision of this Agreement is held to be illegal, invalid, or unenforceable under present or future laws effective during the term of this Agreement, such provision shall be fully severable. However, in lieu thereof, there shall be added a provision as similar in terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

h. *Successors and Assigns.* This Agreement shall be binding on and inure to the benefit of the successors and assigns of the respective Parties to this Agreement. No Party may assign its interests in or obligations under this Agreement without the written consent of the other Party, which consent shall not be unreasonably withheld or delayed.

i. *Waivers.* Waiver of any breach or default hereunder shall not constitute a continuing waiver or a waiver of any subsequent breach either of the same or of another provision of this Agreement and forbearance to enforce one or more of the remedies provided in this Agreement shall not be deemed to be a waiver of that remedy.

j. *Attorneys' Fees and Costs.* The prevailing Party in any litigation or other action to enforce or interpret this Agreement shall be entitled to reasonable attorneys' fees (including fees for use of in-house counsel by a Party), expert witnesses' fees, costs of suit, and other necessary disbursements in addition to any other relief deemed appropriate by a court of competent jurisdiction.

k. *Necessary Actions.* Each Party agrees to execute and deliver additional documents and instruments and to take any additional actions as may be reasonably required to carry out the purposes of this Agreement.

l. *Representations and Warranties.* Each representation and warranty contained herein or made pursuant hereto shall be deemed to be material and to have been relied upon and shall survive the execution, delivery and termination of this Agreement.

m. *Compliance with Law.* In performing their respective obligations under this Agreement, the Parties shall comply with and conform to all applicable laws, rules, regulations and ordinances.

n. *Third Party Beneficiaries.* This Agreement shall not create any right or interest in any non-Party or in any member of the public as a third party beneficiary.

o. *Counterparts.* This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which together shall constitute but one and the same instrument.

p. *Notices.* All notices, requests, demands or other communications required or permitted under this Agreement shall be in writing unless provided otherwise in this Agreement and shall be deemed to have been duly given and received on: (i) the date of service if served personally or served by facsimile transmission on the Party to whom notice is to be given at the address(es) provided below, (ii) on the first day after mailing, if mailed by Federal Express, U.S. Express Mail, or other

similar overnight courier service, postage prepaid, and addressed as provided below, or (iii) on the third day after mailing if mailed to the Party to whom notice is to be given by first class mail, registered or certified, postage prepaid, addressed as follows:

CITY OF REDLANDS:

City of Redlands
35 Cajon Street
Redlands, CA 92373
(909) 798-7533
(909) 798-7535 (FAX)
Attn: Municipal Utilities and Engineering Director

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT:

San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, CA 92408
(909) 387-9211
(909) 387-9247 (FAX)
Attn: General Manager

A Party may change its address for the receipt of notices by providing the other Party with notice of the same pursuant to this paragraph 12p.

CITY OF REDLANDS

By: _____
Pete Aguilar, Mayor

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

By: _____
C. Patrick Milligan,
President, Board of Directors

ATTEST:

_____
Sam Irwin, City Clerk

Exhibit "A"
Facility Map

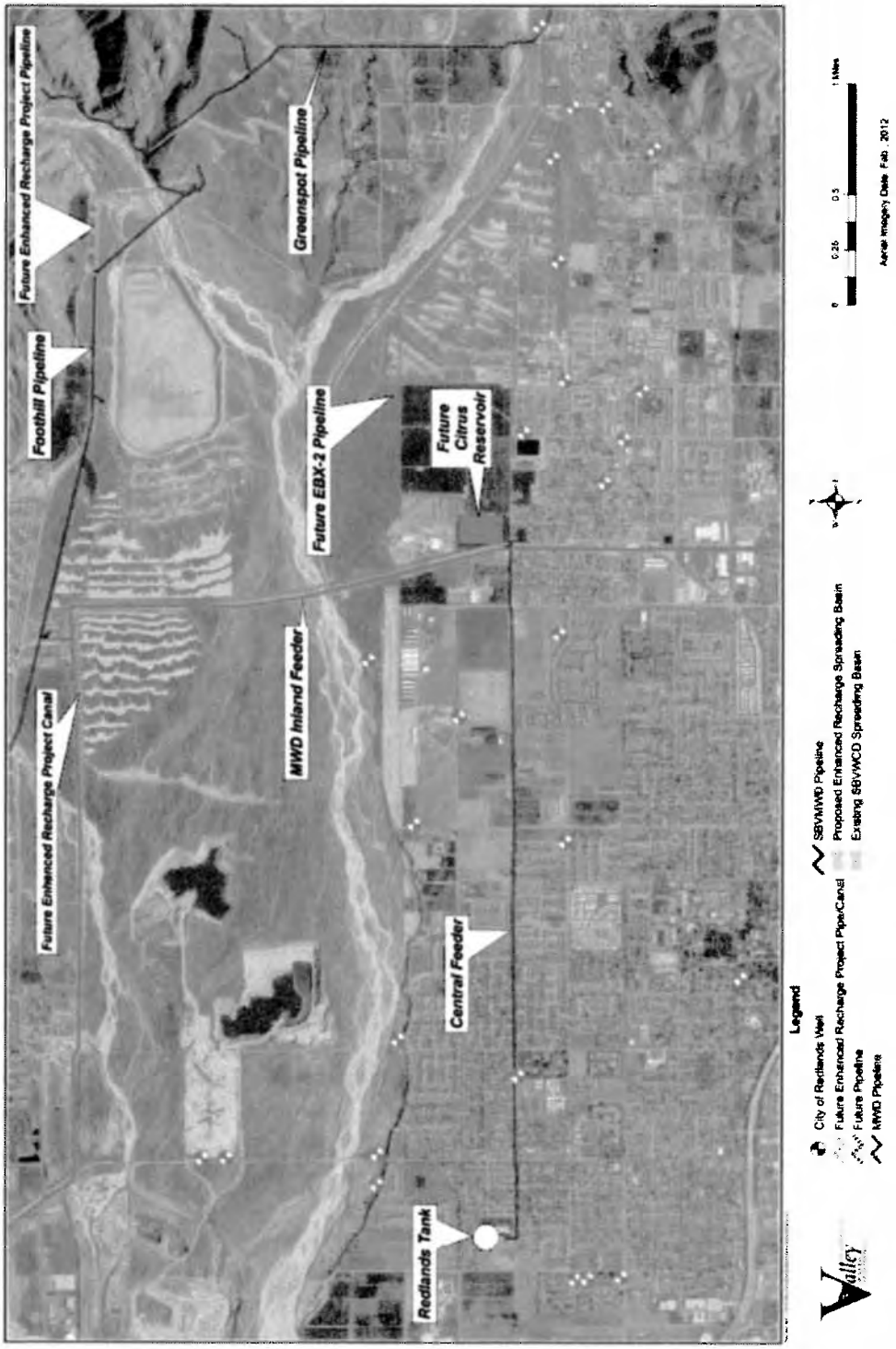


Exhibit "B"
Reimbursement Cost Calculations

CITY OF REDLANDS RESERVOIR #1 (TEXAS ST. RESERVOIR) CAPACITIES

AREA OF TANK

RADIUS	90.0 FT.	
PI	3.1416	
TOTAL AREA (AT) RAD*PI	25446.9 SQFT.	

HEIGHT OF WATER STORED IN TANK.

HIGH WATER SURFACE (H.W.S.)	1351.0 FT.	
BOTTOM OF TANK ELEVATION (TB)	1330.7 FT.	ELEVATION OF RING FOOTING
WATER HEIGHT (WC)	20.3 FT.	
VOLUME OF CONE (VC) VC=(PI*R^2*H)/3 R=90', H=1.0	8482.3 CUFT.	ACCOUNTS FOR VOLUME LOST DUE TO SLOPING TANK BOTTOM
MAX. WATER STORAGE CAPACITY ((AT*WC)-VC)	508853.2 CUFT.	
MAX. WATER STORAGE IN GALLONS	3806730.7 GAL.	7.481 GAL./CUFT.
MAX. USABLE STORAGE ((WC-1.0')*AT)	491888.6 CUFT	BOTTOM FOOT OF MAX. STORAGE IS NOT USABLE
MAX. USABLE STORAGE IN GALLONS (WSU)	3679818.5 GAL.	7.481 GAL./CUFT.

USABLE STORAGE FOR SBVMWD

H.W.S.	1351.0 FT.	
INVERT AT OUTLET OF STANDPIPE	1338.9 FT.	
MAXIMUM USABLE HEIGHT OF WATER (WU)	12.1 FT.	
SBVMWD USABLE STORAGE (AT*WU)	307907.5 CUFT.	
SBVMWD USABLE STORAGE IN GALLONS (WSV)	2303456.0 GAL.	7.481 GAL./CUFT.

COR USABLE STORAGE BELOW SBVWMD STORAGE

INVERT AT OUTLET OF STANDPIPE	1338.9 FT.	
HIGH POINT IN TANK = TB+1.0'	1331.7 FT.	
MAXIMUM USABLE HEIGHT OF WATER (WR)	7.2 FT.	
COR USABLE STORAGE (AT*WR)	183981.1 CUFT.	
COR USABLE STORAGE IN GALLONS (WSR)	1376362.5 GAL.	7.481 GAL./CUFT.

PERCENTAGE OF USABLE WATER STORAGE CALCULATED BY AGENCY

CITY OF REDLANDS	((WSR/WSU)*100%)	37.4%
SBVMWD	((WSV/WSU)*100%)	62.6%

Exhibit "C"

Operation Maintenance and Repair (OMR) shall be calculated as follows: total actual expenditures listed below (Expenditures), multiplied by the percent shown, divided by AF produced in City system multiplied by percent delivered to Valley District.

$$\frac{\text{Total Actual City Expenditures (\$)}}{\text{Total Production (acre-ft)}} \times (\text{\% Sold to Valley District}) = \$\_\_/AF$$

where,

Total Actual City Expenditures = 50% (4000* Salaries) + (4010 Overtime Salaries) + (4012 Stand By) + (5317 Service for Function Facility) + (5590 Street Repair) + 50% (5710_Special Contractual Services)

*Codes are from the City of Redlands Water Fund 501403

Exhibit "D"
Draft Notice of Exemption

Notice of Exemption

To: County Clerk
County of San Bernardino
222 W. Hospitality Lane
San Bernardino, CA 92415-0022

From:
San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, CA 92408

City of Redlands
35 Cajon Street
Redlands, CA 92373

Project Title: Agreement for Use of Water Facilities

Project Location - Specific: City of Redlands – Texas Grove Reservoir

Project Location - City: Redlands **Project Location - County:** San Bernardino

Description of Nature, Purpose and Beneficiaries of Project: The Project is an agreement between the San Bernardino Valley Municipal Water District ("Valley District") and the City of Redlands ("City") (collectively, the "Parties") providing for the cooperative use of existing water storage facilities and well capacity. Under the agreement, Valley District will purchase 2.3 million gallons of capacity in the City's existing Texas Grove Reservoir which is connected to Valley District's Redlands Pump Station that delivers water to Valley Districts Central Feeder Pipeline. Valley District will have an annual option of purchasing up to 20,000 acre-feet of existing well capacity to the extent such capacity is not needed by the City in any given year. The purpose of the Project is to postpone the need for Valley District to construct new water facilities in the area. The project involves the operation of existing facilities within existing limits established by applicable laws, regulations, agreements, and permits.

Name of Public Agency Approving Project: San Bernardino Valley Municipal Water District and City of Redlands

Name of Person or Agency Carrying Out Project: San Bernardino Valley Municipal Water District, City of Redlands

Exempt Status: *(check one)*

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: Sec. 15301, 15303
- ☐ Statutory Exemptions. State code number:

Reasons why project is exempt: The Project is categorically exempt under section 15301 of the CEQA Guidelines because it involves the operation of existing facilities within existing limits established by applicable laws, regulations, agreements, and permits. Valley District will make use of existing storage and well capacity not needed by the City, thus there will be no expansion of those facilities. The connection between the Reservoir and existing pipelines is categorically exempt under section 15301 as an addition to existing structures, and alternatively is categorically exempt under section 15303 as an extension of an existing pipeline of the length necessary to serve the Reservoir.

Lead Agency
Contact Person: Doug Headrick, General Manager **Area Code/Telephone/Extension:** (909) 387-9226

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? Yes No

Signature: Date: Title: General Manager

☒ Signed by Lead Agency Date received for filing at OPR:

☐ Signed by Applicant

1296299 1

DATE FILED & POSTED
#43633

Notice of Exemption

To: County Clerk
County of San Bernardino
222 W. Hospitality Lane
San Bernardino, CA 92415-0022

From:
San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, CA 92408

City of Redlands
35 Cajon Street
Redlands, CA 92373

CLERK OF THE BOARD
APR 09 2013
COUNTY OF
SAN BERNARDINO

Project Title: Agreement for Use of Water Facilities

Project Location - Specific: City of Redlands – Texas Grove Reservoir

Project Location - City: Redlands **Project Location - County:** San Bernardino

Description of Nature, Purpose and Beneficiaries of Project: The Project is an agreement between the San Bernardino Valley Municipal Water District ("Valley District") and the City of Redlands ("City") (collectively, the "Parties") providing for the cooperative use of existing water storage facilities and well capacity. Under the agreement, Valley District will purchase 2.3 million gallons of capacity in the City's existing Texas Grove Reservoir which is connected to Valley District's Redlands Pump Station that delivers water to Valley Districts Central Feeder Pipeline. Valley District will have an annual option of purchasing up to 20,000 acre-feet of existing well capacity to the extent such capacity is not needed by the City in any given year. The purpose of the Project is to postpone the need for Valley District to construct new water facilities in the area. The project involves the operation of existing facilities within existing limits established by applicable laws, regulations, agreements, and permits.

Name of Public Agency Approving Project: San Bernardino Valley Municipal Water District and City of Redlands

Name of Person or Agency Carrying Out Project: San Bernardino Valley Municipal Water District, City of Redlands

Exempt Status: *(check one)*

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: Sec. 15301, 15303
- ☐ Statutory Exemptions. State code number:

Reasons why project is exempt: The Project is categorically exempt under section 15301 of the CEQA Guidelines because it involves the operation of existing facilities within existing limits established by applicable laws, regulations, agreements, and permits. Valley District will make use of existing storage and well capacity not needed by the City, thus there will be no expansion of those facilities. The connection between the Reservoir and existing pipelines is categorically exempt under section 15301 as an addition to existing structures, and alternatively is categorically exempt under section 15303 as an extension of an existing pipeline of the length necessary to serve the Reservoir.

Lead Agency
Contact Person: Douglas Headrick, General Manager

Area Code/Telephone/Extension: (909) 387-9226

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? Yes No

Signature: Douglas Headrick Date: 4/8/13 Title: General Manager

☒ Signed by Lead Agency
☐ Signed by Applicant

Date received for filing at OPR:

1298299.1

State of California—Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE

2013 ENVIRONMENTAL FILING FEE CASH RECEIPT

RECEIPT# 438331

STATE CLEARING HOUSE # *(If applicable)*

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY

LEAD AGENCY: San Bernardino Valley Municipal Water District
DATE: 4/9/13
COUNTY/STATE AGENCY OF FILING: San Bernardino County
DOCUMENT NUMBER:
PROJECT TITLE: Agreement for Use of Water Facilities + City of Redlands
PROJECT APPLICANT NAME: San Bernardino Valley Municipal Water District
PHONE NUMBER: (909) 387-9226
PROJECT APPLICANT ADDRESS: 380 East Vanderbilt Way
CITY: San Bernardino
STATE: CA
ZIP CODE: 92408

PROJECT APPLICANT *(Check appropriate box):*

☒ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	$2,995.25	$
☐ Mitigated/Negative Declaration (ND)(MND)	$2,156.25	$
☐ Application Fee Water Diversion *(State Water Resources Control Board Only)*	$850.00	$
☐ Projects Subject to Certified Regulatory Programs (CRP)	$1,018.50	$
☑ County Administrative Fee	$50.00	$ 50.00
☑ Project that is exempt from fees		
☑ Notice of Exemption		
☐ DFW No Effect Determination (Form Attached)		
☐ Other _____		$ 0

PAYMENT METHOD: 3916103

☐ Cash ☐ Credit ☑ Check ☐ Other _____ TOTAL RECEIVED $ 50.00

SIGNATURE: X [signature] TITLE: [signature]

WHITE - PROJECT APPLICANT YELLOW - DFW/ASB PINK - LEAD AGENCY GOLDEN ROD - COUNTY CLERK DFG 753.5a (Rev. 11/12)

San Bernardino Valley Municipal Water District

396103

CLERK OF THE BOARD
6600 · TAXES & LICENSES

4/8/2013

NOTICE OF EXEMPTION
TEXAS GROVE RESERVOIR

50.00

CLERK OF THE BOARD OF SUPERVISORS
13 APR -9 PM 1:21
COUNTY OF SAN BERNARDINO
CALIFORNIA

CHECKING

50.00

San Bernardino Valley Municipal Water District

396103

CLERK OF THE BOARD
6600 · TAXES & LICENSES

4/8/2013

NOTICE OF EXEMPTION
TEXAS GROVE RESERVOIR

50.00

CHECKING

50.00

2013 AGREEMENT REGARDING ADDITIONAL EXTRACTIONS OF NEW CONSERVATION WATER FROM THE SAN BERNARDINO BASIN AREA BETWEEN WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY AND SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

2013 AGREEMENT REGARDING ADDITIONAL EXTRACTIONS OF NEW CONSERVATION WATER FROM THE SAN BERNARDINO BASIN AREA

This Agreement is entered into between San Bernardino Valley Municipal Water District ("Valley District") and Western Municipal Water District of Riverside County ("Western") on July 17, 2013.

RECITALS

A. Western and Valley District are parties to the Judgment in the case of *Western Municipal Water District of Riverside County v. East San Bernardino County Water District, et al.*, Riverside Superior Court No. 78426 ("Western Judgment" or "Judgment").

B. The Judgment is administered and enforced by a Watermaster, consisting of a committee of two persons, one representative nominated by Valley District, and one by Western.

C. The Judgment further implements the physical solution in the related Orange County Water District action, as well as determines the rights of the named Plaintiffs to extract water from the San Bernardino Basin Area ("SBBA"), and provide replenishment of the area above Riverside Narrows. Among other provisions, the Judgment provides that the annual "adjusted right" of each Plaintiff to extract and export water from the SBBA is the sum of (a) its base right, which was adjusted based on a determination of safe yield and is currently expressed as a percentage of safe yield; and (b) an equal percentage of any new conservation, provided the conditions described in the Judgment are met. Similarly, the Judgment provides that Valley District shall provide imported water for replenishment of the SBBA at least equal to the amount by which extractions in any five year period exceed the 1959-1963 "base period" extractions (such amount was reduced based on a determination of safe yield and may be increased by the amount of any new conservation).

D. "New Conservation" is defined in the Judgment as "[a]ny increase in replenishment from natural precipitation which results from operation of works and facilities not now in existence, other than those works installed and operations which may be initiated to offset losses caused by increased flood control channelization."

E. The Seven Oaks Dam is a component of the Santa Ana River Mainstem Project and was originally conceived as a way to address anticipated flooding on the Santa Ana River. In addition to providing flood control benefits and related incidental water conservation, Western and Valley District wished to formally include water conservation as an element of the facility. In 1991, Western and Valley District jointly filed an application to appropriate water conserved as part of the Seven Oaks project. The State Water Resources Control Board approved the application and issued permits to Western and Valley District in 2010.

F. Construction on the Dam began in the mid 1990s. Western, Valley District and Plaintiffs in the above-referenced action agreed to a methodology for participation in the project and a cost sharing formula pursuant to Paragraph VI(b)2 of the Judgment. Based on the cost sharing formula, Western, Valley District and Plaintiffs entered cost sharing agreements to study the feasibility of water conservation and to fund the physical improvements necessary to achieve water conservation in connection with the operation of the Dam.

G. The acquisition of the water rights permit and the related infrastructure improvements allow Western and Valley District to fully utilize water conserved by the project for replenishment of the SBBA.

H. As part of the 1991-2010 water rights permitting process, Western and Valley District developed models and other analytical tools to forecast hydrology and calculate water conservation. Over the last 2 years, a collaborative group of stakeholders has been meeting to further develop the models and procedures necessary to forecast long-term average New Conservation.

I. In addition to utilizing the recently-developed models and analytical tools to project future long-term average New Conservation, Watermaster has utilized the models and analytical tools to calculate the amount of New Conservation that occurred from 1998 through 2012. Watermaster was previously unable to calculate such New Conservation because the models and analytical tools were still being developed.

J. Consistent with the Judgment and cost-sharing agreements, Plaintiffs have paid their proportionate share of New Conservation-related costs through December 31, 2012 and are therefore entitled to the benefits associated with their allocated share of New Conservation that occurred from 1998 through 2012 due to operation of the Dam.

K. The Judgment does not provide a mechanism by which to allocate New Conservation retroactively. However, Paragraph VI(b)6 of the Judgment provides that Western and Valley District may enter into agreements providing for additional extractions from the SBBA. Western and Valley District have utilized Paragraph VI(b)6 in the past to allow additional extractions from the SBBA.

L. In addition, Western, Valley District and the City of Riverside are parties to an "Agreement Relating to the Diversion of Water from the Santa Ana River System" ("Diversion Agreement") dated March 20, 2007, wherein the parties acknowledge that water conservation in the SBBA associated with the operation of Seven Oaks Dam may cause adverse impacts on the Riverside Basin. The parties agreed that one method of mitigating such adverse impacts was to provide for additional Plaintiff extractions in the SBBA in an amount equal to the amount of replenishment in the SBBA that would have occurred in the Riverside Basin in the absence of the Seven Oaks Project, in exchange for a like amount of reduction in extractions in the Riverside Basin near the key wells used to measure Valley District's compliance with the Judgment objectives

M. Parties to the Diversion Agreement also agreed to implement an accounting methodology under the Western Judgment that will allow Plaintiffs to fully utilize their water

rights in the SBBA. In conjunction with this Agreement, the full use of such water rights could be facilitated by amending the August 18, 2004 Paragraph VI(b)6 agreement entitled "Western Replenishment and Extraction Agreement" which would allow Plaintiffs, in any year in which their entitlement was not fully used, to return any amount of water up to the amount of imported water previously acquired from Western.

N. The primary purpose of this Agreement is to provide for additional extractions of water from the SBBA by Plaintiffs and users within Valley District without replenishment by Valley District in amounts equal to the amount of New Conservation determined by Watermaster to have occurred from 1998 through 2012 due to operation of the Dam. As to future New Conservation associated with the operation of the Dam, Watermaster will utilize Paragraph VI(b)1, VI(b)2, and VI(c) to account for such New Conservation, as provided herein. In addition, another purpose of this Agreement is to ensure implementation of specific provisions of the 2007 Diversion Agreement related to New Conservation, as referenced in Recitals L and M, above.

O. Although the Judgment does not require court approval of Paragraph VI(b)6 agreements, the parties have historically sought court approval of such agreements.

NOW, THEREFORE, in consideration of the mutual covenants of the parties, and based upon the recitals above, IT IS HEREBY AGREED TO AS FOLLOWS:

1. Definition of Additional Extractions. As used herein, the term "additional extractions" means any extraction of water by Plaintiffs in the above-referenced action in excess of the amounts permitted by the Judgment; with respect to entities other than Plaintiffs in such action, the term means any extractions in excess of the total amount of water that can be produced from the SBBA without any replenishment obligation. No replenishment obligations shall be incurred on account of any additional extractions made pursuant to this Agreement.

2. Amount of Additional Extractions. Watermaster has determined that the total quantity of New Conservation resulting from operation of the Seven Oaks Dam for the period of 1998 through 2012 is 42,840 acre-feet. Consistent with the Judgment, such amount may be extracted by Plaintiffs and non-plaintiff entities producing water within the SBBA as additional extractions pursuant to this Agreement.

3. Allocation of Additional Extractions to Plaintiffs. Plaintiffs may make additional extractions from the SBBA for use within Western in any future year in the aggregate amount of 11,974 AF, or 27.95% of the 1998-2012 New Conservation water. Such amount shall be allocated among individual Plaintiffs as follows:

a.	City of Riverside	9,635 AF
b.	Meeks and Daley Water Co.	1,448 AF
c.	Riverside Highland Water Co.	793 AF
d.	Regents of University of California	98 AF

Such individual allocations are in proportion to Plaintiffs' respective shares of the safe yield of the SBBA.

4. Allocation of Additional Extractions to Other Entities. Entities in San Bernardino County other than Plaintiffs who produce water within the SBBA may make additional extractions from the SBBA in any future year in the amount of 30,866 AF, or 72.05% of the 1998-2012 New Conservation water.

5. Periodic Changes in Paragraph VI(b) and VI(c) Allowable Extractions. Periodically Watermaster shall consider making changes in:

(a) the portion of Plaintiffs' "adjusted right" related to New Conservation determined pursuant to Paragraph VI(b); and

(b) the New Conservation to which users in Valley District are entitled pursuant to Paragraph VI(c).

Such periodic consideration and any resulting changes shall be made to ensure that over a long-term period, equal to or greater than the number of years used to forecast the average amount of New Conservation, the amount of New Conservation allowed to be extracted is the same as it would have been if the New Conservation had been made available to Plaintiffs and users within Valley District each year in amounts equal to the actual amount of conserved water that is replenished. Any change shall be made prospectively in order to ensure that such change does not result in a change or reconciliation of a prior year "adjusted right" for Plaintiffs or an amount of New Conservation available for use by users within Valley District.

Periodic consideration of changes in the allowable extractions related to New Conservation shall occur for the duration of the forecast period at intervals of not less than five years nor more than ten years. The periodic consideration of change in the long-term average increase in allowable extractions related to New Conservation shall account for physical improvements in storage, diversion or recharge capability that may result in an increase in the forecast of the long-term average amount of New Conservation; and prospectively account for changes in the long-term forecast that arise from annual determinations of actual New Conservation and/or improvements in the data base and the analytical tools and procedures used to forecast New Conservation.

6. Paragraph VI(b) Service Area Delivery Limitations. The service area delivery limitations provided in Paragraphs V and VI of the Western Judgment shall not apply to New Conservation.

7. Assignment. Any Plaintiff may assign all or a portion of that Plaintiff's right to make additional extractions, as provided in Paragraph 3 herein, to any other Plaintiff.

8. Potential Reductions in Additional Extractions. If at any time prior to the extraction of all additional extractions pursuant to this Agreement Watermaster determines that New Conservation that occurred from 1998-2012 is causing a decrease in the natural safe yield of the SBBA by increasing subsurface outflow or rejecting native recharge that would have

occurred in the absence of Seven Oaks Dam, then Watermaster shall reduce the then-remaining amount of additional extractions provided for in Paragraph 2 and the subsequent amounts allocated to Plaintiffs and Valley District in Paragraphs 3 and 4 by an amount equal to the increase in subsurface outflow or rejected native recharge.

9. Annual Reports. Watermaster shall exclude any additional extractions under this Agreement from extractions in the Annual Report Tables 3A through 3D showing extractions by Plaintiffs. Watermaster shall also exclude additional extractions by entities other than Plaintiffs from the determination of extractions in Table 2 of the Annual Report.

10. Riverside Basin Mitigation Account. Any amount of replenishment in the SBBA resulting from the operation of Seven Oaks Dam and related diversion and spreading facilities that, in the absence of such operation, would have been replenished in the Riverside Basin, shall not be considered New Conservation and shall not be allocated for use by Plaintiffs and users within Valley District and shall instead be included in a Riverside Basin Mitigation Account. Watermaster shall maintain a record of the amount of water in the Riverside Basin Mitigation Account. Western shall maintain in force an agreement with the City of Riverside that provides for the City to increase extractions from its wells in the SBBA by a specified amount and reduce extractions from its Flume Tract wells in the Riverside Basin by the same amount. The agreement shall provide that such change in the location of extractions is subject to the following:

(a) Western and Valley District will jointly determine the specified amount of the change in extractions and the time period for such change; and

(b) The City of Riverside will change the location of extractions as determined by Western and Valley District unless Riverside is unable to do so because of physical or prior contractual constraints.

Watermaster shall account for the required extractions from the SBBA as additional extractions pursuant to Section 9 of this agreement and shall include the amount of the additional SBBA extractions as an extraction by the City of Riverside from Riverside North in the Annual Report Table 5.

11. Amendment to the Paragraph VI(b)6 Western Replenishment and Extraction Agreement. Paragraph 5 of the "Western Replenishment and Extraction Agreement" dated August 18, 2004 is hereby amended to also provide that, "Any Plaintiff at its option may assign and transfer to Western an amount of water equal to its unused water right in the SBBA in any year provided the aggregate amount of such transfers may not exceed the Plaintiffs aggregate amount of previously transferred right to extract imported water pursuant to this paragraph."

Date: July 16, 2013

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

By: _____
President

By: _____
Secretary

WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY

By: _____
President

By: _____
Secretary

APPROVED AS TO FORM:

By: _____
Jill N. Willis
Best Best & Krieger

By: _____
David R. E. Aladjem
Downey Brand LLP

DEPARTMENT OF PUBLIC WORKS

FLOOD CONTROL • LAND DEVELOPMENT & CONSTRUCTION • OPERATIONS
SOLID WASTE MANAGEMENT • SURVEYOR • TRANSPORTATION

COUNTY OF SAN BERNARDINO

825 East Third Street • San Bernardino, CA 92415-0835 • (909) 387-8104
Fax (909) 387-8130

GERRY NEWCOMBE
Director of Public Works

July 26, 2013

Mr. C. Patrick Mulligan, President
Board of Directors
San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, CA 92408

Re: **PLANNING MEMORANDUM OF UNDERSTANDING BETWEEN THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT AND THE SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT – AGREEMENT NO. 13-608**

Dear Mr. Mulligan:

Please find enclosed the executed copy of the above-referenced agreement which was approved, by the Board of Supervisors on behalf of the San Bernardino County Flood Control District on July 23, 2013, for your records.

If you have any questions, please contact Kenneth Eke at (909) 387-8120

Sincerely,

D Stewart for

KENNETH C. EKE, P.E., Chief
Flood Control Planning Division

KE:dja

Enclosure

cc: Front File
Reading File

SBVMWD LEGAL
DOCUMENT **2404**

REPORT/RECOMMENDATION TO THE BOARD OF SUPERVISORS OF THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT AND RECORD OF ACTION

July 23, 2013

FROM: **GERRY NEWCOMBE, Director**
Flood Control District

SUBJECT: **PLANNING MEMORANDUM OF UNDERSTANDING BETWEEN THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT AND THE SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT**

RECOMMENDATION(S)

Acting as the governing body of the San Bernardino County Flood Control District, approve a ten year Planning Memorandum of Understanding **(Agreement No. 13-608)** between the San Bernardino County Flood Control District and the San Bernardino Valley Municipal Water District for the purpose of working together in the planning and evaluation of San Bernardino County Flood Control District facilities for joint use by the San Bernardino County Flood Control District and the San Bernardino Valley Municipal Water District for both flood control and groundwater replenishment operations.
(Presenter: Gerry Newcombe, Director, 387-7906)

BOARD OF SUPERVISORS COUNTY GOALS AND OBJECTIVES

Pursue County Goals and Objectives by Working with Other Public Agencies.
Implement the Countywide Vision.

FINANCIAL IMPACT

Approval of this item will not result in the use of Discretionary General Funding (Net County Cost). The Planning Memorandum of Understanding (MOU) does not commit the San Bernardino County Flood Control District (FCD) to any expenditure other than staff time which has been accounted for in the 2013-14 budget. Site specific agreements may be brought to the Board of Supervisors at a later date that will contain provisions bringing revenue to FCD.

BACKGROUND INFORMATION

Approval of this item will authorize FCD to enter into an MOU with the San Bernardino Valley Municipal Water District (Valley District) to work cooperatively in the planning and evaluation of the possible joint use of FCD's facilities for both flood control and groundwater replenishment operations. The MOU does not bind FCD to any project. Any proposed use of FCD properties by Valley District that originates from this MOU is at the sole discretion of FCD.

cc: Flood Control-Eke w/agreement & Newcombe
Contractor c/o Flood Control w/agreement
Auditor-Controller/Treasurer/Tax Collector-Accounts Payable Manager w/agreement
EBIX-BPO c/o Risk Management
CAO-Nelson & Olhasso
File - w/agreement
ml 07/25/13
ITEM 42

Rev 7-1-13

Record of Action of the Board of Supervisors

APPROVED (CONSENT CALENDAR)
COUNTY OF SAN BERNARDINO
County Flood Control District

MOTION	AYE	AYE	SECOND	MOVE	AYE
	1	2	3	4	5

LAURA H. WELCH, CLERK OF THE BOARD

BY _____

DATED: July 23, 2013

FCD owns and operates a number of flood control facilities within Valley District's operational boundaries. Valley District and FCD first entered into a cooperative agreement for Valley District to deliver water to several FCD detention basins for purposes of recharging the groundwater basin in 1972, and both agencies have continued to cooperatively use these facilities ever since. Valley District is now interested in expanding the number of facilities used in this effort, in addition to upgrading the facilities currently used, in order to maximize the amount of water recharge performed while acknowledging the primary goal of FCD facilities is to maintain adequate flood protection for the safety and protection of the public. FCD and Valley District wish to jointly explore the opportunities to use existing flood control basins and perhaps other facilities owned by either party, for the combined purposes of adequate flood control and useful and beneficial water replenishment operations. The MOU establishes the framework for FCD and Valley District to work together to plan and evaluate the environmental, operational and financial impacts of such combined use of their facilities. The MOU does not authorize or guarantee any specific project and the parties will comply with the California Environmental Quality Act (CEQA) prior to approving any specific project. Any future use of a facility shall be subject to the parties' approval of a site specific agreement. The MOU remains in effect for a term of ten years and provides that the parties may agree to extend the MOU for subsequent ten-year periods. Either party may terminate the MOU prior to its expiration date, but only if there is cause (e.g. breach of the agreement), and after providing the other party a 60-day written notice and opportunity to cure.

REVIEW BY OTHERS

This item has been reviewed by County Counsel (Scott Runyan, Deputy County Counsel, 387-5455) on June 28, 2013, County Administrative Office (Cory Nelson, Administrative Analyst, 387-4378) on July 1, 2013, and Finance and Administration (Mary Jane Olhasso, Assistant Executive Officer, 387-4599) on July 8, 2013.

FOR OFFICIAL USE ONLY

ORIGINAL

San Bernardino County Flood Control District

F A S

CONTRACT TRANSMITTAL

☒ New ☐ Change ☐ Cancel	FAS Vendor Code	SC	Dept.	A	Contract Number 13-608
ePro Vendor Number					ePro Contract Number
Flood Control District		Dept. 094	Orgn. 094		Contractor's License No.
Contract Representative: Kenneth C. Eke, Chief, FC Planning Division		Telephone: 909-387-8120			Total Contract Amount

Contract Type: ☐ Revenue ☐ Encumbered ☐ Unencumbered ☒ Other: Grant

If not encumbered or revenue contract type, provide reason:

Commodity Code	Contract Start Date	Contract End Date	Original Amount	Amendment Amount
			$	

Fund	Dept.	Organization	Appr.	Obj/Rev Source	GRC/PROJ/JOB No.	Amount
RFL	093	093			F02481	
RFF	092	092			F02482	

Project Name: PLANNING MOU SBVMWD

Estimated Payment Total by Fiscal Year

FY	Amount	I/D	FY	Amount	I/D
FY 13/14					

CONTRACTOR San Bernardino Valley Municipal Water District

Federal ID No. or Social Security No.

Contractor's Representative C. Patrick Mulligan, President, Board of Directors

Address 380 East Vanderbilt Way, San Bernardino, CA 92408 Phone 909-387-9200

Nature of Contract: Planning Memorandum of Understanding (MOU) between the San Bernardino County Flood Control District (FCD) and the San Bernardino Valley Municipal Water District (Valley District) to work cooperatively in the planning and evaluation of the possible joint use of FCD's facilities for both flood control and groundwater replenishment operations.

Approved as to Legal Form (sign in blue ink)	Reviewed as to Contract Compliance	Presented to Board for Signature
► Counsel	►	►
Date 7-19-13	Date 7/22/13	Date 7/22/13

(Attach this transmittal to all contracts not prepared on the "Standard Contract" form.

Auditor-Controller/Treasurer/Tax Collector Use Only

☐ Contract Database	☐ FAS
Input Date	Keyed By

Revised 03/22/2012

Planning Memorandum of Understanding
San Bernardino County Flood Control District (FCD) and
San Bernardino Valley Municipal Water District (Valley District)

1. *Recitals*

a. WHEREAS, the FCD was created by the San Bernardino County Flood Control Act of 1939, found in Chapter 43 of the California Water Code Appendix (Flood Control Act), and its primary statutory objects and purposes are to provide for the control of flood and storm waters and secondarily to conserve such flood and storm waters, and other waters, for beneficial uses in FCD's district area by spreading, storing, retaining, and through percolation.

b. WHEREAS, Valley District was formed in 1954 as a regional agency formed to plan a long-range water supply for the San Bernardino Valley and it imports water into its service area from the State Water Project and manages groundwater storage within its boundaries.

c. WHEREAS, FCD owns and operates a number of flood control facilities within Valley District's boundaries.

d. WHEREAS, Valley District and FCD first entered into a cooperative agreement for Valley District to deliver water to FCD detention basins for purposes of recharging the groundwater basin in 1972, and Valley District and FCD have continued to cooperatively use these facilities ever since.

e. WHEREAS, Valley District is interested in continuing to cooperatively use FCD's flood control facilities to promote groundwater recharge while acknowledging the primary goal of FCD facilities to maintain adequate flood protection for the safety and protection of the public.

f. WHEREAS, as a general matter, FCD and Valley District wish to jointly explore the opportunities to use existing flood control basins (and perhaps other facilities owned by either party) for the combined purposes of adequate flood control and useful and beneficial water replenishment operations.

g. WHEREAS, FCD and Valley District wish to enter into this Planning Memorandum of Understanding (MOU) to describe in general terms their interests in coordinating their efforts to plan and evaluate the environmental and financial impacts of such combined use of FCD's facilities.

h. WHEREAS, as provided herein, this MOU does not authorize nor guarantee any specific project and the parties will comply with the California Environmental Quality Act (CEQA) prior to approving any specific project.

NOW, THEREFORE, it is mutually agreed as follows:

2. *Understandings*

a. *Priorities*

i. The parties recognize that flood control is a higher, better and more necessary public use of the property and facilities owned by the FCD pursuant to the Flood Control Act and other state and federal law. This MOU shall be subject to the paramount legal duties and obligations of FCD pursuant to the Flood Control Act.

ii. The FCD shall have the sole discretionary authority to determine what constitutes "adequate flood protection" for the operation of its facilities.

iii. FCD shall have the sole discretionary authority to determine which of its facilities are available for use in re-charge activities proposed by the Valley District. Any future use of a FCD facility shall be subject to the parties' approval of a site specific agreement.

iv. Based on the priorities and discretion provided in this Section 2.a., "Priorities", as well as the general planning nature of this MOU, FCD and Valley District acknowledge and agree that no implied covenants attach to this agreement, including, but not limited to, the implied covenant of good faith and fair dealing.

b. *Term*

This MOU shall have a term of 10 years from the date on which the last party executes this MOU. This MOU may be extended by the parties for subsequent 10-year periods, subject to approval by both parties.

c. *General Planning Efforts*

i. Once a specific plan is initiated by Valley District for the specific use of a particular flood control facility, the parties agree to allocate sufficient staff time and resources to evaluate the joint use/operation of that existing facility for adequate flood control purposes in conjunction with water replenishment. Valley District shall provide to FCD all of the details associated with the proposed use for each FCD facility including, but not limited to, any proposed improvements (including a statement as to which entity will own the improvements after a project specific agreement terminates) and a proposed operational plan for each FCD facility. This information will also include the amount of estimated recharge for both

native stormwater and State Water Project water (if any), or other sources of water, for each facility, and quality of such water.

ii. The joint evaluation may consider replenishment with both native water and water from the State Water Project or other sources and shall also consider the potential effects of groundwater replenishment to the environment, including, but not limited to, an evaluation of whether such activities will introduce water quality pollutants or mobilize existing groundwater contamination, or will cause land subsidence, liquefaction, or seepage to low lying lands in any basin to be impacted by the replenishment activities of Valley District. The parties acknowledge that Valley District will be the agency primarily leading this evaluation as it has the appropriate expertise concerning groundwater storage and the quality of waters from sources such as the State Water Project. FCD will independently review Valley District's evaluation.

iii. Considering the statutory purposes of the FCD and the goals of Valley District, both parties agree that they will determine, on a case by case basis, which agency will be in charge of seeking permits for projects and which agency will be the "Lead Agency" for purposes of complying with CEQA.

iv. Valley District will work cooperatively with FCD towards Valley District's goal of maximizing the quantity of water that can be replenished annually from the existing flood control basins, while maintaining or improving the protection of the public from the dangers of flooding. In general, FCD will not object to Valley District's use of FCD's fee owned properties or the modification of existing flood control basins that are owned in fee by FCD by means of the installation of dual-purpose facilities, *provided* that: (i) Valley District is responsible for all regulatory and other costs associated with said activities, and (ii) the incremental cost of those modifications is paid by Valley District, and (iii) FCD reviews and is satisfied with the individual circumstances surrounding the proposed project and the existing flood control facility. Nothing in this paragraph is intended to alter the sole discretionary authority of the FCD concerning the uses of its facilities.

v. The parties will also collaborate with other local, state and federal agencies with regulatory authority over these activities, including, but not limited to, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the California Regional Water Quality Control Board, the California Department of Fish and Wildlife and any others.

vi. Valley District agrees to pay a reasonable use fee for the use of the FCD's land and facilities as agreed to by both parties on a case by case basis.

vii. Valley District acknowledges and agrees that future project specific agreements with FCD will include indemnification and insurance provisions developed by FCD's counsel and FCD's Risk Management Department that adequately protect FCD from any and all claims, actions, losses, and damages arising out of the water conservation and replenishment activities described in this MOU. The parties agree that such indemnification and insurance provisions will be negotiated in consideration of the individual circumstances surrounding each existing flood control facility on a case-by-case basis.

viii. Valley District acknowledges and agrees that future project specific agreements with FCD will also require FCD permits.

3. *General Provisions*

a. *Early Termination.* Either party may terminate this agreement prior to its expiration date for cause, *provided* that it has provided 60-day written notice and opportunity to cure to the other party prior to termination.

b. *Recitals Incorporated Herein.* The parties agree and acknowledge that the recitals set forth above are true and correct and are fully incorporated in this MOU.

c. *Non-Exclusive Agreement.* Nothing in this MOU shall prevent either party from working cooperatively with other individuals, public agencies or private organizations to improve flood protection or groundwater recharge within that party's respective jurisdiction.

d. *Authority.* Each signatory of this MOU represents that he/she is authorized to execute this MOU on behalf of the party for which he/she signs. Each party represents that it has legal authority to enter into this MOU and to perform all obligations under this MOU.

e. *Amendment.* This MOU may be amended or modified only by a written instrument executed by each of the parties to this MOU.

f. *Jurisdiction and Venue.* This MOU shall be governed by and construed in accordance with the laws of the state of California, except for its conflicts of law rules. Any suit, action, or proceeding brought under the scope of this MOU shall be brought and maintained to the extent allowed by law in the County of San Bernardino, California.

g. *Headings*. The paragraph headings used in this MOU are intended for convenience only and shall not be used in interpreting this MOU or in determining any of the rights or obligations of the parties to this MOU.

h. *Construction and Interpretation*. This MOU has been arrived at through negotiations and each party has had a full and fair opportunity to revise the terms of this MOU. As a result, the normal rule of construction that any ambiguities are to be resolved against the drafting party shall not apply in the construction or interpretation of this MOU.

i. *Entire Agreement*. This MOU constitutes the entire agreement of the parties with respect to the subject matter of this MOU and supersedes any prior oral or written agreement, understanding, or representation relating to the subject matter of this MOU.

j. *Attorneys' Fees and Costs*. Regardless of whether it is the prevailing party in any litigation or other action to enforce or interpret this MOU, each party shall bear its own attorneys' and expert witnesses' fees, costs of suit and other necessary disbursements. This paragraph shall not apply to the costs or attorney(s) fees relative to Section 3.p., "Indemnification and Insurance."

k. *Necessary Actions*. Each party agrees to execute and deliver additional documents and instruments and to take any additional actions as may be reasonably required to carry out the purposes of this MOU.

l. *Third Party Beneficiaries*. This MOU shall not create any right or interest in any non-party or in any member of the public as a third party beneficiary.

m. *Counterparts*. This MOU may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which together shall constitute but one and the same instrument.

n. *Notices*. All notices, requests, demands or other communications required or permitted under this MOU shall be in writing unless provided otherwise in this MOU and shall be deemed to have been duly given and received on: (i) the date of service if served personally or served by facsimile transmission on the party to whom notice is to be given at the address(es) provided below, (ii) on the first day after mailing, if mailed by Federal Express, U.S. Express Mail, or other similar overnight courier service, postage prepaid, and addressed as provided below, or (iii) on the third day after mailing if mailed to the party to whom notice is to be given by first class mail, registered or certified, postage prepaid, addressed as follows:

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

Director
Department of Public Works
County of San Bernardino
825 East Third Street
San Bernardino, California 92415
Telephone: (909) 387-7906
Facsimile: (909) 387-7911

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

General Manager
San Bernardino Valley Municipal Water District
380 East Vanderbilt Way
San Bernardino, California 92408
Telephone: (909) 387-9200
Facsimile: (909) 387-9247

o. *Assignment.* This MOU may not be assigned by either party without the written consent of the other party.

p. *Indemnification and Insurance.* FCD agrees to indemnify, defend (with counsel approved by Valley District) and hold harmless Valley District, its employees, officers, agents, and volunteers from any and all claims, actions, losses, damages, and/or liability resulting from FCD's negligent acts or omissions which arise from FCD's performance of its obligations under this MOU. Valley District agrees to indemnify, defend (with counsel approved by FCD) and hold harmless the FCD, its employees, officers, agents, and volunteers from any and all claims, actions, losses, damages, and/or liability resulting from the Valley District's negligent acts or omissions which arise from the Valley District's performance of its obligations under this MOU. In the event, FCD and/or Valley District is found to be comparatively at fault for any claim, action, loss or damage which results from their respective obligations under this MOU, FCD and/or Valley District shall indemnify the other to the extent of its comparative fault. FCD and Valley District shall maintain throughout the term of this MOU such policies of insurance or legally sufficient self-insurance for Professional Liability (as applicable), Automobile Liability, Comprehensive General Liability, and Workers' Compensation that are adequate to protect against all liabilities and indemnification responsibilities arising out of the performance of the terms, conditions or obligations of this MOU.

IN WITNESS WHEREOF, the parties have caused this MOU to be executed by their duly authorized officers or representatives as of the last day and year appearing below.

---------- **Signatures on Following Page** ----------

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

By: _____
C. Patrick Milligan
President, Board of Directors

Date: 7-16-13

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

By: _____
Janice Rutherford, Chair, Board of Supervisors

Date: JUL 23 2013

ATTEST:

By: _____
Clerk

SIGNED AND CERTIFIED THAT A COPY OF THIS CONTRACT HAS BEEN DELIVERED TO THE CHAIRMAN OF THE BOARD

Laura H. Welch
Clerk of the Board of Supervisors
of the County of San Bernardino

By: _____
Deputy

APPROVED AS TO FORM:
SPECIAL DISTRICT COUNSEL

By: _____
David R.E. Aladjem
Special Counsel

Date: 7/18/13

APPROVED AS TO FORM:
COUNTY COUNSEL

By: _____
Scott Runyan
Deputy County Counsel

Date: 7-19-13

AMENDMENT TO AGREEMENT TO FORM THE UPPER SANTA ANA RIVER WASH LAND MANAGEMENT AND HABITAT CONSERVATION PLAN TASK FORCE

THIS AMENDMENT TO AGREEMENT TO FORM THE UPPER SANTA ANA RIVER WASH LAND MANAGEMENT AND HABITAT CONSERVATION PLAN TASK FORCE ("Amendment") is made effective this 1st day of September, 2013, by and between the following entities (hereinafter individually referred to as a "Party" and collectively referred to as the "Parties"):

CEMEX CONSTRUCTION MATERIALS, LP ("CEMEX")

CITY OF HIGHLAND ("HIGHLAND")

CITY OF REDLANDS ("REDLANDS")

COUNTY OF SAN BERNARDINO ("SAN BERNARDINO COUNTY")

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT ("SBVWCD" OR "CONSERVATION DISTRICT")

ROBERTSON'S READY MIX, LTD ("ROBERTSON'S")

EAST VALLEY WATER DISTRICT ("EVWD")

REDLANDS MUNICIPAL UTILITIES AND ENGINEERING DEPARTMENT ("RMUED")

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT ("SBCFCD")

UNITED STATES BUREAU OF LAND MANAGEMENT ("BLM")

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT ("VALLEY DISTRICT")

RECITALS

This Amendment is entered into on the basis of the following facts, understandings, and intentions of the Parties:

A. All Parties hereto, except Valley District, entered into that certain "Agreement to Form the Upper Santa Ana River Wash Land Management and Habitat Conservation Plan Task Force" on November 20, 2002 ("Original Agreement"), for the purposes of advancing environmental planning and permitting in connection with the Upper Santa Ana River Wash Land Management Plan ("Wash Plan").

B. Since the time the Original Agreement was entered into, planning for the Wash Plan has advanced in all phases, including with respect to groundwater recharge and other water conservation facilities. In connection with such facilities, Conservation District and Valley District have entered into a series of agreements to allow for joint use

of Conservation District property, and construction of additional facilities as part of an Enhanced Recharge Program with Valley District, to fulfill various of the Wash Plan objectives regarding expanded groundwater recharge and water conservation capabilities.

C. The Original Agreement provided, in paragraph 2 (G), that all Parties acknowledged and agreed that the effectiveness of the Task Force may be improved by the addition of other entities that had interest in the work of the Task Force, and given Valley District's intended role in contributing to expanding groundwater recharge facilities in the Wash Plan area, Valley District is such an entity.

D. At a Task Force meeting held July 16, 2013, the Task Force reviewed cost estimates for the completion of environmental review and permitting activities for the Wash Plan, and the individual members will be going to their respective governing bodies for funding authorization for the completion of such environmental review and permitting activities. In addition, the Task Force has refined its description of covered activities to be included within the "take" and other permitting authorizations proposed to be pursued, such that the Wash Plan process is now at a point where responsible estimates for long-term habitat maintenance and other costs can be generated, and an equitable distribution of such costs over parties sponsoring, or benefitting from, component projects of the overall Wash Plan can be determined.

E. The Parties therefore wish to amend the Original Agreement to add Valley District as a regular member of the Task Force, and to specify their going-forward intentions for additional consultations for deriving an equitable cost-sharing allocation for the costs that may be incurred by the Task Force members for implementation of the Habitat Conservation Plan and other permanent funding requirements that may attend final Wash Plan approval.

NOW, THEREFORE, the Parties do hereby agree as follows:

1. Valley District is, and henceforth shall be, a "Regular Member" of the Task Force under Section 2 (A) of the Original Agreement. Valley District shall pay a one-time fee into the Fund (provided in Section 5 (C) of the Task Force Agreement) of $275,000.00. Such amount shall be utilized by the Conservation District, as Project Manager, to help offset the Conservation District's share of interim and estimated costs of completion of the environmental and permitting documentation for the Wash Plan. The Task Force at its meeting on July 16, 2013 approved estimated costs for planning and consulting services.

2. The Parties agree to meet and confer, in order to rework the contribution levels specified in Exhibit "B-1" to the Original Agreement, for those expenses that will be required of the Task Force members for costs for implementation of the Habitat Conservation Plan and other implementation funding requirements that may attend final Wash Plan approval. As presently contemplated, the basis for the allocation of such implementation costs shall be allocated on a proportionate acreage basis as it relates to the habitat disturbances attributable to the portions of the

component projects of the Wash Plan advanced by, sponsored by, or benefitting Task Force members, with offsetting credit being given to the amount of habitat as acreage being contributed by various Task Force members. The Task Force will refine such costs allocations once the PAR analysis and final permitting costs are more fully determined.

3. Except as specifically amended herein, the Original Agreement remains in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have entered into the Amendment as of the day and year first set forth above.

APPROVED AS TO FORM:

_____
Counsel for CEMEX

CEMEX CONSTRUCTION MATERIALS, LP

_____

APPROVED AS TO FORM:

_____
Counsel for Robertson's Ready Mix, Ltd.

ROBERTSON'S READY MIX, LTD.

_____

UNITED STATES BUREAU OF LAND MANAGEMENT

_____
Field Manager

APPROVED AS TO FORM:

_____
General Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
General Counsel

EAST VALLEY WATER DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

[SIGNATURES CONTINUED ON FOLLOWING PAGE]

APPROVED AS TO FORM:

_____
City Attorney

REDLANDS MUNICIPAL UTILITIES AND ENGINEERING DEPARTMENT

_____
Mayor

Attest: _____
City Clerk

APPROVED AS TO FORM:

_____
County Counsel

COUNTY OF SAN BERNARDINO

_____
Chairperson, Board of Supervisors

Attest: _____
Clerk of the Board

APPROVED AS TO FORM:

_____
General Counsel

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

_____
Chairperson, Board of Supervisors

Attest: _____
Clerk of the Board

APPROVED AS TO FORM:

_____
City Attorney

CITY OF REDLANDS

_____
Mayor

Attest: _____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF HIGHLAND

_____
Mayor

Attest: _____
City Clerk

[SIGNATURES CONTINUED ON FOLLOWING PAGE]

APPROVED AS TO FORM:

General Counsel

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

President, Board of Directors

Attest:

Secretary, Board of Directors

AGREEMENT TO FORM THE UPPER SANTA ANA RIVER WASH LAND MANAGEMENT AND HABITAT CONSERVATION PLAN TASK FORCE

THIS AGREEMENT is made effective this 20TH day of NOV, 2002, by and between the following entities (hereinafter individually referred to as a "Party" and collectively referred to as the "Parties"):

CEMEX CONSTRUCTION MATERIALS, LP ("CEMEX")	ROBERTSON'S READY MIX, LTD ("ROBERTSON'S")
[CITY OF HIGHLAND ("HIGHLAND")]	EAST VALLEY WATER DISTRICT ("EVWD")
CITY OF REDLANDS ("REDLANDS")	REDLANDS UTILITIES DEPARTMENT ("RUD")
COUNTY OF SAN BERNARDINO ("SAN BERNARDINO COUNTY")	SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT ("SBCFCD")
SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT ("SBVWCD" OR "CONSERVATION DISTRICT")	UNITED STATES BUREAU OF LAND MANAGEMENT ("BLM")

RECITALS

This Agreement is entered into on the basis of the following facts, understandings, and intentions of the Parties:

A. Representatives of numerous agencies, including water, mining, flood control, resource management and conservation, and municipalities, formed the Santa Ana River Wash Area Coordinating Planning Activities Committee ("Wash Committee") to address local mining issues and other land functions on the Upper Santa Ana River Wash ("Wash"). A Policy Action Committee ("PAC") was subsequently established, consisting of elected officials from San Bernardino County, Highland, Redlands, and the Conservation District, as well as the Field Manager of the BLM. A Technical Advisory Committee ("TAC") was also formed with representatives from the PAC agencies, and other water, mining, flood control, and resource protection interests.

B. The Wash Committee examined the most appropriate manner in which to use the Wash for the benefit of all landowners without regard to preexisting planning of the Wash or current land ownership. Ultimately, the Wash Committee determined that there should be a balance of land uses to accommodate the needs of mineral extraction, water conservation, habitat protection, and municipal infrastructure

requirements (i.e. utilities, trails, etc.). To achieve land use balance, current land uses must be reassigned to better accommodate mineral extraction, water conservation, and habitat. To effect such change, an exchange of existing land ownership between BLM and the Conservation District, and a transfer of leasehold interests between the mining companies and the Conservation District will be required.

C. The TAC reached a general consensus in early 2000 regarding the designation of specific areas of the Wash for the desired uses. The result of this multi-jurisdictional effort was the creation of a proposed Land Management and Habitat Conservation Plan for the Upper Santa Ana River Wash ("Concept Plan"). The Concept Plan establishes the framework for balancing ongoing and future land activities proposed for the Wash Planning Area ("WPA"), including habitat protection areas and recreational trail alignments. The Concept Plan was reviewed and endorsed by the governing boards and/or officials with approval authority from each of the Parties, and various other agencies involved in the deliberations on the Concept Plan.

D. Each of the Parties have found and determined that it is in their best interests to join together to: manage activities in connection with the necessary refinements, environmental review, and implementation of the Land Management and Habitat Conservation Plan (collectively the "Project"); provide an equitable cost-sharing mechanism for the funding of the Project; and, define the projected schedule and scope of work to execute the Project.

E. The Parties hereto now enter into this Agreement to establish a Task Force, consisting of a representative from each party, to oversee and administer the preparation of plans, environmental review documents, public notices and hearings, and other activities requisite to the formulation and, if adopted, execution of the Project.

F. In entering into this Agreement, the Parties reserve their discretionary authority with regard to the execution of the Project, including but not limited to, any land use and planning authority under state and local law, authority, designated under the Surface and Mining Recovery Act ("SMARA"), and CEQA approval of their own discretionary decisions executing the Project.

TERMS & CONDITIONS

SECTION 1: DESCRIPTION OF PROJECT.

The Project to be undertaken by the Task Force consists of all of the following:

A. Refinement and expansion of the Concept Plan (Exhibit "A") to develop the Component Plans of a "Land Management and Habitat Conservation Plan for the Upper Santa Ana River Wash" ("Plan"), which includes the following:

1. A Mining and Reclamation Plan under the Surface Mining and Reclamation Act ("SMARA") designating the areas as generally depicted in Exhibit "A" to be devoted to sand, gravel, and mineral extraction and the terms and conditions under which such extraction may proceed, which will be provided by CEMEX and

Robertson's to the appropriate municipality, Highland or Redlands, for review and approval;

2. A Water Conservation Plan, which describes the scope, extent, and location of water diversions, conveyance, spreading, and monitoring activities, which will be provided by the Conservation District;

3. A Recreation Plan, which coordinates the planning and development of trails, parks, and public recreation areas, which will be provided by Conservation District, San Bernardino County, and Redlands;

4. An Infrastructure Plan, which describes the location of pipelines, utility corridors, roads, highways, and communication facilities, which will be provided by the Conservation District, EVWD, and Redlands;

5. A Habitat Protection Plan, which will be provided by the Conservation District to identify habitat areas that may be considered to protect threatened and endangered species at such time as other activities within the Wash are presented to the appropriate agency for entitlements, approvals and /or land use permits; and

6. A Flood Control Plan, which describes flood control facilities/activities including detention and retention basins, drains, and storm water conveyance facilities, which will be provided by SBCFCD.

B. Preparation of preliminary documents necessary to conduct an environmental analysis, including the following:

1. A Project Description for the environmental analysis based on the Component Plans described above;

2. Alternative land balancing plans to be studied in the environmental analysis;

3. A plan outline, including actions, required funding, and the administrative or legislative measures needed to implement the Project, which will be known as the Implementation Action Plan; and

4. A draft agreement to execute the Implementation Action Plan, which will be known as the Implementation Agreement.

C. Preparation of an EIR/EIS for implementation of the Plan, including a mitigation monitoring plan, based on the Component Plans in 1.A. above, and the preliminary documents in 1.B. above.

D. Completion of a proposed land exchange between BLM and Conservation District. BLM, working with the Conservation District, shall undertake activities to assess, and if appropriate, implement by way of a Memorandum of Understanding or

other appropriate instrument with the Conservation District, a land exchange. The assessment and potential implementation of the land exchange will analyze whether portions of property currently owned by BLM can feasibly and beneficially be exchanged for portions of property owned by the Conservation District.

E. Preparation of the implementation documents based on the completed EIR/EIS, including the following:

1. A certification of the EIR and record of decision for the EIS;

2. An Implementation Action Plan; and

3. A Habitat Conservation Plan, including a programmatic Section 10a Take Permit.

F. Task Force submit the EIR/EIS, Implementation Action Plan, and Habitat Conservation Plan to the appropriate agencies for their action and, if adopted, subsequent implementation.

SECTION 2: CREATION OF THE TASK FORCE.

There is hereby created a task force that shall be known as the Upper Santa Ana River Wash Land Management and Habitat Conservation Plan Task Force ("Wash Task Force" or "Task Force"). The Task Force shall oversee and direct preparation of the Project and shall be comprised of regular and advisory members as follows:

A. Regular Members.

Each Party who contributes financially to fund the Project in accordance with Exhibit "B" to this Agreement, as may be amended from time to time, or contributes with in-kind services that result in a product for use by the Task Force commensurate with the level of contribution identified in Exhibit "B," shall be deemed a Regular Member of the Task Force. Any dispute regarding whether "in-kind" services contributions by a Party entitles such Party to status as a Regular Member shall be submitted to all then-existing Task Force Regular Members, and will be decided by a majority vote of the Task Force Regular Members. Each Regular Member shall be entitled to appoint two (2) representatives to the Task Force concurrently with the execution of this Agreement. Each Regular Member shall appoint (1) representative to oversee and contribute to the technical/staff aspects of the Task Force's work, and one (1) member of the legislative body, Board of Directors, or other body with ultimate decision making and policy making authority for the Regular Member, who shall be the voting member of the Task Force. Notwithstanding that each Regular Member shall have two (2) representatives to the Task Force, each Regular Member shall have and exercise only one (1) vote. The identity of each of the appointed representatives from each respective Party shall be promptly communicated to the Project Manager. Appointed representatives to the Task Force shall serve at the pleasure of the governing body of the respective appointing Party, and may be removed by them at any time, with or without cause; provided, however, that the Parties acknowledge and agree the continuity of representation on the

Task Force is important to the overall effectiveness of the Task Force, and the Parties further agree to ensure such continuity whenever possible.

B. Advisory Members.

1. Any member of the TAC, which is not a Regular Member of the Task Force, and any other public or governmental agency, may with the approval of a majority of the Regular Members of the Task Force, designate representatives as non-voting advisors to the Task Force ("Advisory Members"). The Task Force will formally recognize these Advisory Members and ensure all materials and products of the Task Force are provided to the Advisory Members. A list of Advisory Members will be maintained by the Project Manager.

2. The California Department of Water Resources (DWR), the California Department of Fish and Game (DFG), and the United States Fish and Wildlife Service (USFWS), County of Orange, and the City of Highland are hereby designated as Advisory Members to the Task Force.

3. Advisory Members may be admitted as Regular Members, with voting privileges, with approval by a majority vote of Regular Members of the Task Force.

C. Function.

1. The Task Force shall oversee and direct the preparation of all of the component elements of the Project.

2. The Task Force shall assist in the selection of a consultant to assist in planning and implementing the Project ("Consultant"). The Consultant selected must be acceptable to the Federal lead agency.

3. The Task Force shall meet periodically for the purpose of reviewing and evaluating the work product of the Task Force and the Consultant.

4. The Task Force shall administer this Agreement, subject to the reserved right of each of the Parties to approve their respective financial appropriations to Task Force budgets.

5. The Task Force shall propose contribution levels for each Party, subject to Section 4.D. herein. The contribution level for each Party shall initially be those set out in Exhibit "B" hereto.

6. The Task Force shall, in consultation with the Consultant, prepare and adopt a project schedule ("Project Schedule"). When completed, the Project Schedule will be circulated among all Regular and Advisory Members, and will be maintained by the Project Manager.

D. Committees.

The Task Force may establish working committees, which shall be designated from a pool of Regular and Advisory members who shall be selected by and serve at the pleasure of the Task Force.

E. Designation of Officers.

The Task Force shall designate and appoint one of its representatives to act as Chair and another of its members to act as Vice-Chair, both of which shall be selected from the pool of Regular Members. The Conservation District shall perform the functions of project administrator, including secretarial and treasurer duties.

F. Meetings

Regular meetings of the Task Force shall be held at the Conservation District offices, or such other place as may be agreed upon by the Task Force. At the first meeting, the Task Force shall provide for the time and place of its regular meetings. Special meetings may be called at the request of the Chair or of a majority of Regular Members to the Task Force. A majority of Regular Members of the Task Force shall constitute a quorum for the purposes of transacting business. Except as otherwise provided herein, all actions of the Task Force shall be passed and adopted upon the affirmative vote of a majority of the quorum of Regular Members. All meetings of the Task Force shall be conducted in accordance with California's Open Meeting Laws. The Project Manager shall keep or cause to be kept, minutes of the meetings of the Task Force, copies of which shall be forwarded to each Task Force representative and to each Party. The Task Force may adopt, from time to time, such additional rules and regulations for the conduct of its affairs as may be required.

G. Additional Parties.

The Parties to this Agreement acknowledge and agree that the effectiveness of the Task Force may be improved by the addition of other entities that have interest in the work of the Task Force. Such entities may join the Task Force upon approval of a majority of the Regular Members of the Task Force, and upon such terms and conditions as are acceptable to such Regular Members, including, but not limited to, cash contributions to past, present, and/or future work of the Task Force.

H. City of Highland as Regular Member.

At the time of execution of this Agreement, the City of Highland has expressed its interest in joining the Task Force as a Regular Member, and the parties to this Agreement contemplate and desire that it do so. Provided City of Highland approves and executes this Agreement within One Hundred Eighty (180) days of the Effective Date, and pays its share of the Task Force Contribution Levels as set forth in Exhibit "B-1," for application to all expenses incurred by the Task Force from the Effective Date and following, City of Highland may join the Task Force, as a Regular Member, without the necessity of an approving vote of the Regular Members. In the event City of

Highland so joins the Task Force pursuant to the terms and conditions of this Section 2 (H), and effective immediately and prospectively from the date it does, various provisions of this Agreement shall be thereupon automatically be amended, all as more specifically set out in Exhibit "D" hereto.

SECTION 3: LEAD AGENCY DESIGNATION

A. Consistent with the First Amendment to the Memorandum of Understanding Regarding Coordinated Planning Activities Pertaining to the Santa Ana River Wash Area dated August 13, 1997, ("MOU") and its designation of the Conservation District as the Permanent Chair of the Policy Action Committee, the Conservation District is hereby designated as the Lead Agency for all non-federal activities associated with the Project under the California Environmental Quality Act ("CEQA").

B. The BLM is hereby designated as the Lead Agency for all federal activities associated with the Project under the National Environmental Policy Act ("NEPA").

SECTION 4: PROJECT MANAGER.

A. The Conservation District shall serve as the Project Manager, at the pleasure of the Task Force. The Project Manager shall act as the primary liaison and contact between the Consultant, the Task Force, and the Parties to the Second Amendment.

B. The duties of the Project Manager shall include the following:

1. Serve as the Lead Agency under CEQA and as assistant to BLM, which is the Lead Agency under NEPA; provided, however, that on issues relating to definition of level of significance for impacts, existence of and mitigation for significant adverse environmental impacts, and formulation of a mitigation monitoring program for those portions of the Project which involve mining activity within the jurisdictional boundaries of Redlands, and which require permits under SMARA, the Project Manager shall accept and incorporate into the EIR/EIS the determinations of Redlands for such aspects of the Project.

2. Administer the cost-sharing formula, which designates the percentage of the total cost of the Project, as approved by each Party to fund the Project;

3. Coordinate communications between the Consultant and the Parties;

4. Provide the Consultant with copies of all earlier studies and EIRs, which may be helpful to the Consultant to complete the Project;

5. Gather and transmit data to the Consultant from the Parties;

6. Provide periodic reports to the Task Force of the progress of the Project;

7. Report to and solicit input from the Task Force regarding policy issues that may arise;

8. Oversee the billing for all aspects of the Project;

9. Receive and pay all appropriate invoices for the Consultant;

10. Review the Consultant's charges and advise the Task Force of any problems associated with the Project;

11. Facilitate meetings of the Task Force and maintain records of the Task Force;

12. The Project Manager shall, through a written Notice to Proceed, cause the Consultant to commence the Project, and shall cause the Consultant to perform all services within the time period(s) established in the Project Schedule, and in conformity with the approved Project Flow Diagram, attached hereto as Exhibit "C"; and,

13. Either approve or deny by way of written response any requests for minor adjustments to the time period(s) specified in the Project Schedule.

C. Administration of Task Force Work.

The Conservation District shall make its personnel available as reasonably necessary to the Task Force to perform the secretarial, clerical, administrative, legal general counsel, and financial management duties requested by the Task Force. The Task Force shall compensate the Conservation District for the Conservation District's actual costs incurred in providing such services to the Task Force, upon presentation of an invoice detailing the services rendered and costs thereof, and approval of the same by the Task Force.

SECTION 5: FUNDING MECHANISM.

A. The current estimated cost for the preparation of plans and environmental review for the Project is $823,258, or $973,258 if the consultant prepares the Implementation Agreement. The Task Force shall periodically approve a contribution amount to be requested of all Regular Members, to be paid to and managed by the Project Manager consistent with the provisions of this Section 4, from which the Project Manager will meet the expenses incurred in implementing the Project. Contributions shall be apportioned among the Parties, as agreed to by the Parties. The initial levels of contribution are identified in Exhibit "B" to this Agreement.

B. The Conservation District as Project Manager shall coordinate Consultant retention, direction, coordination, and oversight in the planning and implementation of

the Project, and shall serve as the agency through which funds are to be conveyed and disbursed for the purpose of completing the Project.

C. The Conservation District shall establish a fund ("Fund") into which it will cause to be deposited all of the contributions received from the Task Force towards the estimated cost of the Project. It is intended that this Fund finance the Project in its entirety. In establishing the Fund, the Conservation District shall assure that all interest earned by the Fund is to be paid into the Fund, and made solely available for the funding of the Project. The Task Force may from time to time propose a cost-sharing formula differing from that attached as Exhibit "B", which designates the percentage of the total cost of the Project each Party will be required to contribute to the Fund. Upon approval by the Task Force of a contribution amount to be requested of the Regular Members, the Project Manager shall submit invoices to each Party requesting payment of their respective contributions, pursuant to the formula attached as Exhibit "B," or as otherwise proposed by the Task Force. Payment of these invoices shall be made to the Conservation District within 30 days of receipt of such invoice. If any Regular Member fails to timely remit payment of its share of the invoices in accordance to Exhibit "B" to this Agreement, the voting rights of such Regular Member shall be suspended until such time as the full amount of the invoice is paid, or the final resolution of any dispute regarding the invoice, as provided below. During such period of suspension, the Party shall enjoy only those rights and privileges as an Advisory Member of the Task Force.

D. Each Party reserves the right to approve its own contribution level to the Project, as well as its ultimate payment authority of invoices issued by the Project Manager, in whole or in part, on a per-invoice basis.

E. The Project Manager shall have authority and control of disbursements from the Fund. The Project Manager shall provide the Task Force with an accounting on at least a quarterly basis showing all disbursements, accrued interest, and other debits and credits to the Fund for the preceding quarter. Any amounts paid to the Project Manager shall not be subject to refund, except as provided herein.

F. Should a dispute arise between the Project Manager and any Party(ies) with respect to either an invoice submitted by the Consultant or any other disbursement from the Fund, the complaining Party(ies) shall notify the Project Manager in writing, specifying the nature of the objections, the reasons therefor, and the action the complaining Party(ies) requests the Project Manager to take in resolution of the dispute. Upon receipt of any such written objection, the Project Manager shall meet or otherwise confer with the complaining Party(ies) in a good faith effort to resolve the dispute. In the event such efforts do not result in resolution of the dispute within ten (10) days of the Project Manager's receipt of the written objection, the Project Manager shall refer the matter to the Task Force, and shall provide it with any and all receipts, invoices, or other documents necessary for the prompt resolution of the dispute. The Task Force shall consider and resolve the matter at its next scheduled meeting, but no later than thirty (30) days following the Project Manager's referral of the dispute to the Task Force. In resolving the dispute, the decision of the majority of the Regular Members of the Task Force shall be final.

G. Upon completion of the Project, or earlier termination of this Agreement, any unexpended Funds shall be returned to the Parties in proportion to their financial contribution.

SECTION 6: OWNERSHIP OF DOCUMENTS.

All work produced in association with the Project (including originals prepared by anyone in connection with, or pertaining to, the work of the Task Force) shall become the property of the Regular Members of the Task Force, and each of them.

SECTION 7: INDEMNIFICATION.

Neither the Project Manager nor any officer or employee thereof shall be responsible to any other Party for any damage or liability occurring by reason of anything done, or omitted to be done, by the Consultant, or in connection with any work, authority or jurisdiction delegated to the Project Manager under this Agreement. All Parties, and each of them, hold the Project Manager harmless from any claim, demand, suit of law or equity, or other proceeding arising from or relating to the Project Manager's performance of its obligations contemplated by this Agreement. Nothing herein shall be read or understood as indemnifying or holding the Conservation District, or any officer or employee thereof, harmless from any claim, demand, suit on law or equity, or other proceeding arising from or relating from the acts or omissions of the Conservation District while acting as a Party to this Agreement.

In addition, each Party agrees to indemnify, defend, and hold harmless each other Party and its officers, employees, agents, and volunteers from any and all claims, actions, losses, damages, and/or liability arising out of its obligations under this Agreement.

In the event any Party is found to be comparatively at fault for any claim, action, or loss, or damage that results from their respective obligations under this Agreement, the Party(s) found to be at fault shall indemnify the other(s) to the extent of its comparative fault.

Federal agencies' obligations under this Agreement shall be to the extent permitted by the Federal Tort Claims Act.

SECTION 8: NOTICES.

All notices required to be provided hereunder, except meeting notices, shall be in writing, and either served personally or sent by United States Mail. Meeting notices may be provided by electronic mail correspondence. For these purposes, the addresses for the Parties and Advisory Members are as follows:

As to Cemex Construction Materials, LP:
Regional Environmental Manager
CEMEX
P.O. Box 4120
Ontario, CA 91761-1607

As to Robertson's Ready Mix:
Robertson's Ready Mix, Ltd.
Attention: Rich Robertson
P.O. Box 33140
Riverside, CA 92519

[As to Highland:
Community Development Director
City of Highland
27215 Base Line
Highland, CA 92346]

As to Redlands:
Community Development Director
City of Redlands
P.O. Box 3005
Redlands, CA 92373

As to SBCFCD:
Director
San Bernardino Co. Flood Control District
825 E. Third Street
San Bernardino, CA 92415-0835

As to Conservation District:
General Manager
San Bernardino Valley Water District
P.O. Box 1839
Redlands, CA 92373-0581

As to USFWS:
Field Supervisor
U.S. Fish & Wildlife Service
2730 Loker Avenue West
Carlsbad, CA 92008

As to County of Orange:
Attn: Mike Wellborn
Planning and Development Services
County of Orange
P.O. Box 4048
Santa Ana, CA 92702-4048

As to EVWD:
General Manager
East Valley Water District
P.O. Box 3427
San Bernardino, CA 92413

As to RUD:
Chief of Water Resources
Redlands Utilities Department
P.O. Box 3005
Redlands, CA 92373

As to San Bernardino County:
Land Use Services Department
Advance Planning Division
County of San Bernardino
385 North Arrowhead Avenue – 3rd Floor
San Bernardino, CA 92415-0182

As to BLM:
Field Manager, Palm Springs-South Coast
Field Office
Bureau of Land Management
P.O. Box 581260
North Palm Springs, CA 92258-1260

As to DFG:
Department of Fish & Game
P.O. Box 1217
Redlands, CA 92373

As to DWR:
Recreation and Environmental Studies
Department of Water Resources
770 Fairmont
Glendale, CA 91203

SECTION 9: ENTIRE AGREEMENT.

This Task Force Agreement contains the entire agreement of the Parties hereto with respect to the matters contained herein, and supersedes all negotiations, prior discussions, and preliminary agreements or understandings, written or oral relating to

the Task Force and Project Manager. No waiver or modification of this Agreement shall be binding unless consented to by all Parties in writing.

SECTION 10: WAIVER.

No waiver of any default shall constitute a waiver of any other default or breach, whether of the same or other covenant or condition. No waiver, benefit, privilege, or service voluntarily given or performed by a Party shall give the other Party any contractual rights by custom, estoppel, or otherwise.

SECTION 11: COOPERATION: FURTHER ACTS.

All parties agree to use reasonable care and diligence to perform their respective obligations under this Agreement. All parties agree to act in good faith to execute all instruments, prepare all documents, and take all actions as may be reasonably necessary, appropriate or convenient to carry out the purposes of this Agreement.

SECTION 12: GOVERNING LAW.

This Agreement shall be governed by and construed under the laws of the State of California. Federal agency participation under this Agreement, however, shall be governed by the applicable federal laws.

SECTION 13: ATTORNEYS' FEES.

In the event the Task Force initiates or defends any litigation or other judicial or administrative proceeding in connection with the Project or this Agreement, retention of counsel to represent the Task Force, if required, shall be by the Project Manager, subject to the approval of the Task Force. The costs of such retention will be invoiced to the members of the Task Force in the same manner, and subject to the same procedures, as all other consultant costs invoiced to the Task Force. In any action or proceeding involving a dispute between the Parties arising out of this Agreement, the prevailing Party shall be entitled to receive from the other Party, reasonable attorneys' fees. The term "attorneys' fees" shall include reasonable costs for investigating the action, conducting discovery, cost of appeal, costs and fees for expert witnesses, and all other normally allowable costs incurred in such litigation, whether or not such litigation is prosecuted to final judgment. Service of process on any Party shall be made in any manner permitted by law and shall be effective whether served inside or outside of California.

Notwithstanding the foregoing, attorneys' fees and costs' recoverable against the United States, however, shall be governed by applicable federal laws.

SECTION 14: NO THIRD PARTY BENEFICIARIES.

There are no intended third party beneficiaries of any right or obligation assumed by the Parties. No member of, or delegate to, Congress or Federal Resident

Commissioner, shall be entitled to any share of this Agreement, or to any benefit that may arise from it.

SECTION 15: CONSTRUCTION: CAPTIONS.

The language of this Agreement shall be construed according to its fair meaning, and not for or against any Party hereto based on authorship. The captions of the various articles and paragraphs are for convenience and ease of reference only, and do not define, limit, augment, or describe the scope, content, or intent of this Agreement.

SECTION 16: SEVERABILITY.

Each provision of this Agreement shall be severable from the whole. If any provision of this Memorandum shall be found contrary to law, it is the intention of all the Parties, and each of them, that the remainder of this Agreement shall continue in full force and effect.

SECTION 17: INCORPORATION OF RECITALS.

The Recitals are incorporated herein and made an operative part of this Agreement.

SECTION 18: AUTHORITY TO ENTER INTO AGREEMENT.

All Parties warrant that they have all requisite power and authority to execute and perform this Agreement. Each person executing this Agreement on behalf of their party warrants that he or she has the legal power, right, and authority to make this Agreement and bind his or her respective Party, and that in so doing, such Party is not thereby in breach of any other contract or agreement.

SECTION 19: COUNTERPARTS.

This Agreement may be signed in counterparts, each of which shall constitute an original.

SECTION 20: EFFECTIVE DATE

The Effective Date of this Agreement shall be latest of the dates set next to the signatures of the parties hereto evidencing signature by all the parties hereto, which latest date shall be inserted into the preamble to this Agreement.

SECTION 21: NO ASSIGNMENT.

The rights and obligations of this Agreement may not be transferred, assigned, or encumbered by any Party hereto without the prior, express, written consent of a majority of the Regular Members of the Task Force.

SECTION 22: DISSOLUTION.

The Task Force may be dissolved upon a 2/3 majority vote of the regular members. Upon such dissolution, the Project Manager is entitled to pay all outstanding invoices, and distribute any remaining money in the Fund among the contributing members pro-rata according to each Party's respective financial contribution.

SECTION 23: TERMINATION.

A. Any Party may voluntarily terminate its participation under the Agreement at any time upon delivery of at least 60 days prior written notice to the Task Force.

B. The Task Force may, upon a 2/3 majority vote, terminate any Party's participation under the Agreement upon that Party's failure to make its pro-rata contribution:

(1) Within 30 days of the date said Party's contribution becomes due; OR

(2) Within 45 days after the Task Force resolves said Party's dispute over the payment of an invoice in favor of payment as set forth in Section 4(F) of this Agreement.

C. Upon a Party's termination from participation under the Agreement, the Project Manager shall return the portion of that Party's pro-rata contribution not expended by the Project Manager after paying invoices for all charges incurred during the period that Party served as a Member of the Task Force.

D. The termination of any member or members of the Task Force shall not affect the remaining Parties' obligations under this Agreement, except for redistribution of contributions described herein. This Agreement shall remain in effect until such time as 2/3 of the regular members vote to dissolve the Task Force as provided by Section 22 of this Agreement.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the Parties hereto have entered into this Agreement as of the day and year set forth below, the last of which shall be the effective date of this Agreement.

APPROVED AS TO FORM:

Counsel for CEMEX

CEMEX CONSTRUCTION MATERIALS, LP, by CEMEX, Inc., its General Partner

APPROVED AS TO FORM:

Counsel for Robertson's Ready Mix, Ltd.

ROBERTSON'S READY MIX, LTD

UNITED STATES BUREAU OF LAND MANAGEMENT

Field Manager

APPROVED AS TO FORM:

General Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

General Counsel

EAST VALLEY WATER DISTRICT

President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

City Attorney

REDLANDS UTILITIES DEPARTMENT

Mayor

Attest: _____
City Clerk

IN WITNESS WHEREOF, the Parties hereto have entered into this Agreement as of the day and year set forth below, the last of which shall be the effective date of this Agreement.

APPROVED AS TO FORM:

_____
Counsel for CEMEX

CEMEX CONSTRUCTION MATERIALS, INC.:

_____

APPROVED AS TO FORM:

_____
Counsel for Robertson's Ready Mix, Ltd.

ROBERTSON'S READY MIX, LTD

_____

UNITED STATES BUREAU OF LAND MANAGEMENT

_____
Field Manager

APPROVED AS TO FORM:

_____
General Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
General Counsel

EAST VALLEY WATER DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
City Attorney

REDLANDS UTILITIES DEPARTMENT

_____
Mayor

Attest: _____
City Clerk

IN WITNESS WHEREOF, the Parties hereto have entered into this Agreement as of the day and year set forth below, the last of which shall be the effective date of this Agreement.

APPROVED AS TO FORM:

_____
Counsel for CEMEX

CEMEX CONSTRUCTION MATERIALS, INC.

_____

APPROVED AS TO FORM:

_____
Counsel for Robertson's Ready Mix, Ltd.

ROBERTSON'S READY MIX, LTD

_____

UNITED STATES BUREAU OF LAND MANAGEMENT

_____
Field Manager

APPROVED AS TO FORM:

_____
General Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
General Counsel

EAST VALLEY WATER DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
City Attorney

REDLANDS UTILITIES DEPARTMENT

_____
Mayor

Attest: _____
City Clerk

IN WITNESS WHEREOF, the Parties hereto have entered into this Agreement as of the day and year set forth below, the last of which shall be the effective date of this Agreement.

APPROVED AS TO FORM:

_____
Counsel for CEMEX

CEMEX CONSTRUCTION MATERIALS, INC.

_____

APPROVED AS TO FORM:

_____
Counsel for Robertson's Ready Mix, Ltd.

ROBERTSON'S READY MIX, LTD

_____

UNITED STATES BUREAU OF LAND MANAGEMENT

_____
Field Manager

APPROVED AS TO FORM:

David B. Cosper
General Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

Sterling Woodbury
President, Board of Directors

Attest: Burnell Cawsey
Secretary of the Board

APPROVED AS TO FORM:

_____
General Counsel

EAST VALLEY WATER DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
City Attorney

REDLANDS UTILITIES DEPARTMENT

_____
Mayor

Attest: _____
City Clerk

IN WITNESS WHEREOF, the Parties hereto have entered into this Agreement as of the day and year set forth below, the last of which shall be the effective date of this Agreement.

APPROVED AS TO FORM:

_____
Counsel for CEMEX

CEMEX CONSTRUCTION MATERIALS, LP

_____

APPROVED AS TO FORM:

_____
Counsel for Robertson's Ready Mix, Ltd.

ROBERTSON'S READY MIX, LTD

_____

UNITED STATES BUREAU OF LAND MANAGEMENT

_____
Field Manager

APPROVED AS TO FORM:

_____
General Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
General Counsel

EAST VALLEY WATER DISTRICT

Vice George E."Skip" Wilson
President, Board of Directors

Attest: Robert E. Martin
Secretary of the Board

APPROVED AS TO FORM:

_____
City Attorney

REDLANDS UTILITIES DEPARTMENT

_____
Mayor

Attest: _____
City Clerk

IN WITNESS WHEREOF, the Parties hereto have entered into this Agreement as of the day and year set forth below, the last of which shall be the effective date of this Agreement.

APPROVED AS TO FORM:

_____
Counsel for CEMEX

CEMEX CONSTRUCTION MATERIALS, LP

_____

APPROVED AS TO FORM:

_____
Counsel for Robertson's Ready Mix, Ltd.

ROBERTSON'S READY MIX, LTD

_____

UNITED STATES BUREAU OF LAND MANAGEMENT

_____
Field Manager

APPROVED AS TO FORM:

_____
General Counsel

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

_____
General Counsel

EAST VALLEY WATER DISTRICT

_____
President, Board of Directors

Attest: _____
Secretary of the Board

APPROVED AS TO FORM:

N/A
_____
City Attorney

REDLANDS UTILITIES DEPARTMENT

_____
Mayor

Attest: _____
City Clerk

APPROVED AS TO FORM:

_____
County Counsel

COUNTY OF SAN BERNARDINO

_____
Chairperson, Board of Supervisors

Attest: _____
Clerk of the Board

APPROVED AS TO FORM:

_____
County Counsel

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

_____
Chairperson, Board of Supervisors

Attest: _____
Clerk of the Board

APPROVED AS TO FORM:

_____
City Attorney

CITY OF REDLANDS

_____
Mayor

Attest: _____
City Clerk

[APPROVED AS TO FORM:]

[_____]
[City Attorney]

[CITY OF HIGHLAND]

[_____]
Mayor

[Attest: _____]
[City Clerk]

APPROVED AS TO FORM:

_____
County Counsel

COUNTY OF SAN BERNARDINO

_____
Chairperson, Board of Supervisors

Attest: _____
Clerk of the Board

APPROVED AS TO FORM:

_____
General Counsel

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

_____
Chairperson, Board of Supervisors

Attest: _____
Clerk of the Board

APPROVED AS TO FORM:

N/A
City Attorney

CITY OF REDLANDS

_____
Mayor

Attest: _____
City Clerk

[APPROVED AS TO FORM:]

[_____]
[City Attorney]

[CITY OF HIGHLAND]

[_____]
[Mayor]

[Attest: _____]
[City Clerk]

APPROVED AS TO FORM:

County Counsel

COUNTY OF SAN BERNARDINO

Chairperson, Board of Supervisors

Attest: Clerk of the Board

APPROVED AS TO FORM:

General Counsel

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

Chairperson, Board of Supervisors

Attest: Clerk of the Board

APPROVED AS TO FORM:

City Attorney

CITY OF REDLANDS

Mayor

Attest: City Clerk

[APPROVED AS TO FORM:]

[City Attorney]

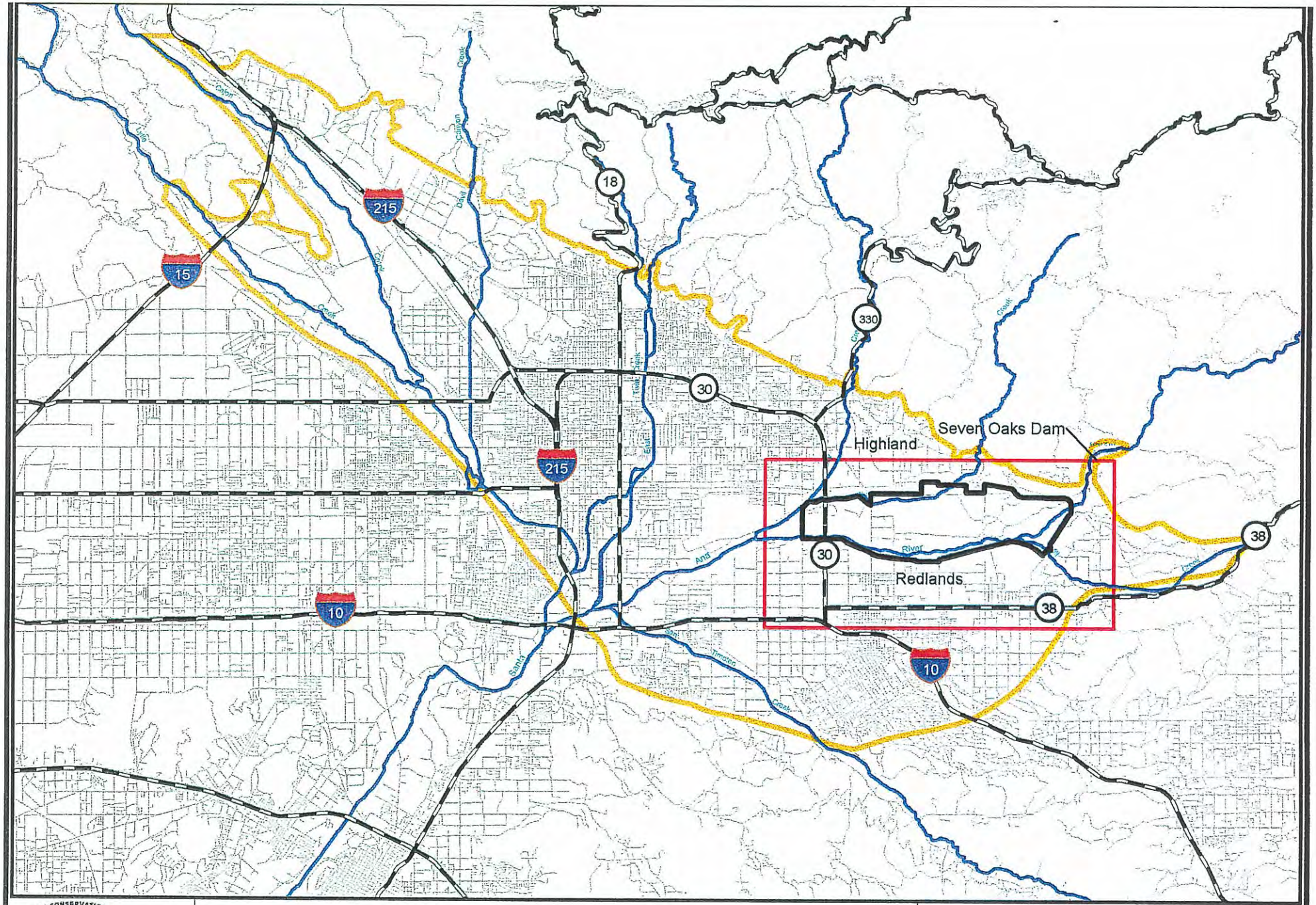
[CITY OF HIGHLAND]

[Mayor]

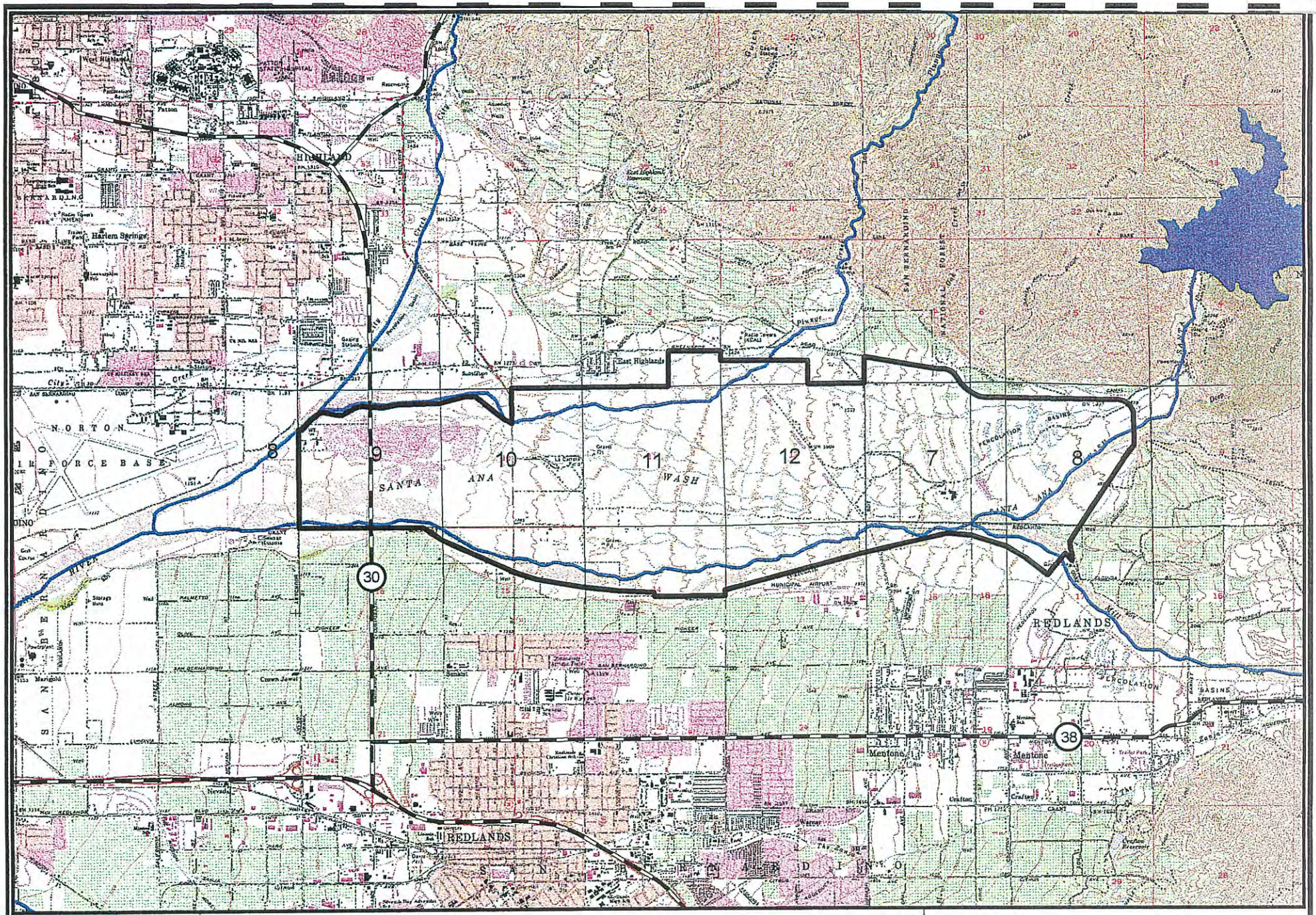
[Attest: [City Clerk]]

EXHIBIT "A": CONCEPT PLAN (Executive Summary)

AREAS TO BE MINED UNDER SMARA, AREAS FOR WATER CONSERVATION, AND AREAS FOR PROTECTION OF HABITAT



Santa Ana Wash Planning Area (Plan B) - Location Map (Fig. 1)



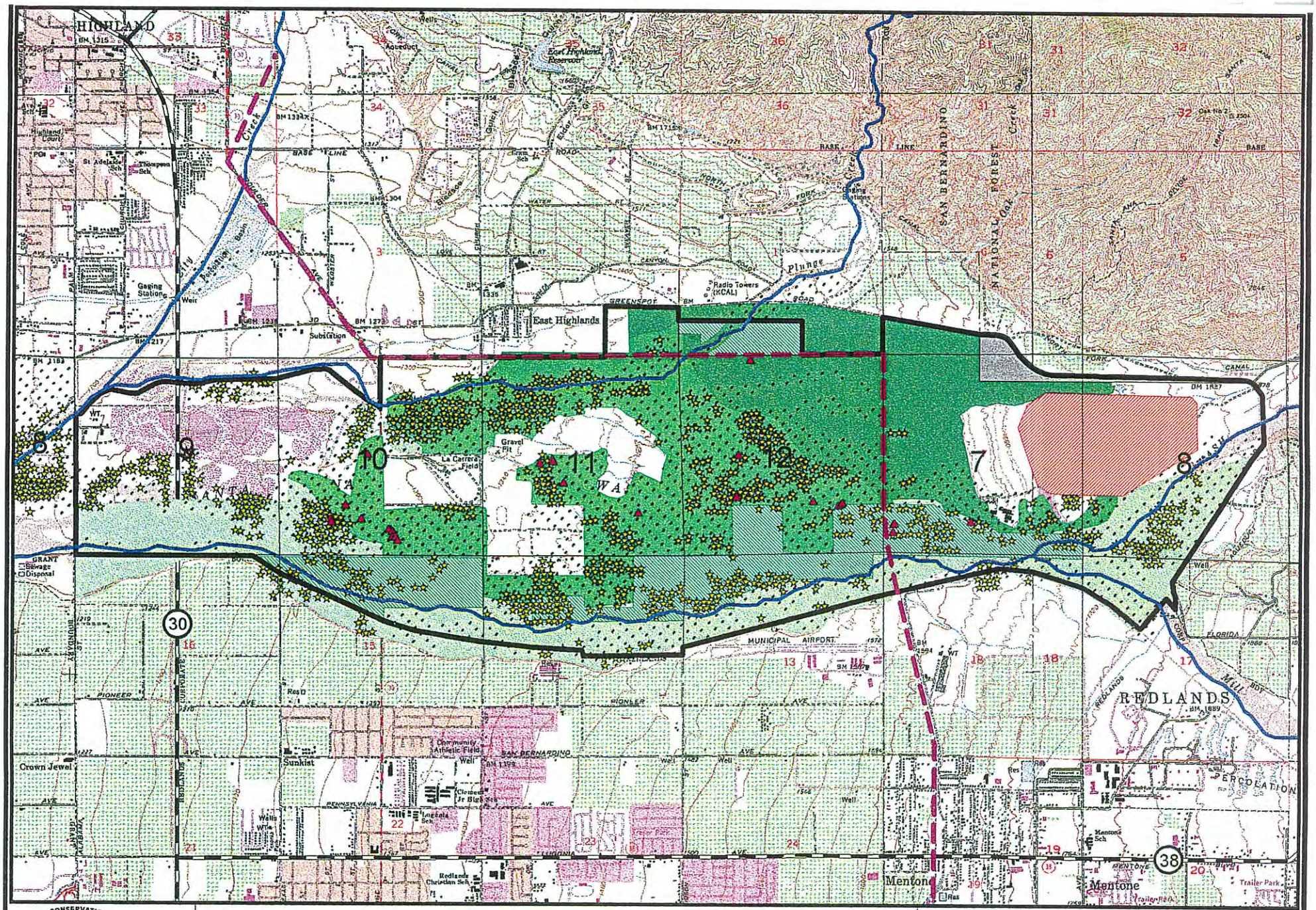
SBV WATER CONSERVATION DISTRICT
OUR NAME IS OUR MISSION

7-Jul-2009

800 0 800 1600 2400 Feet

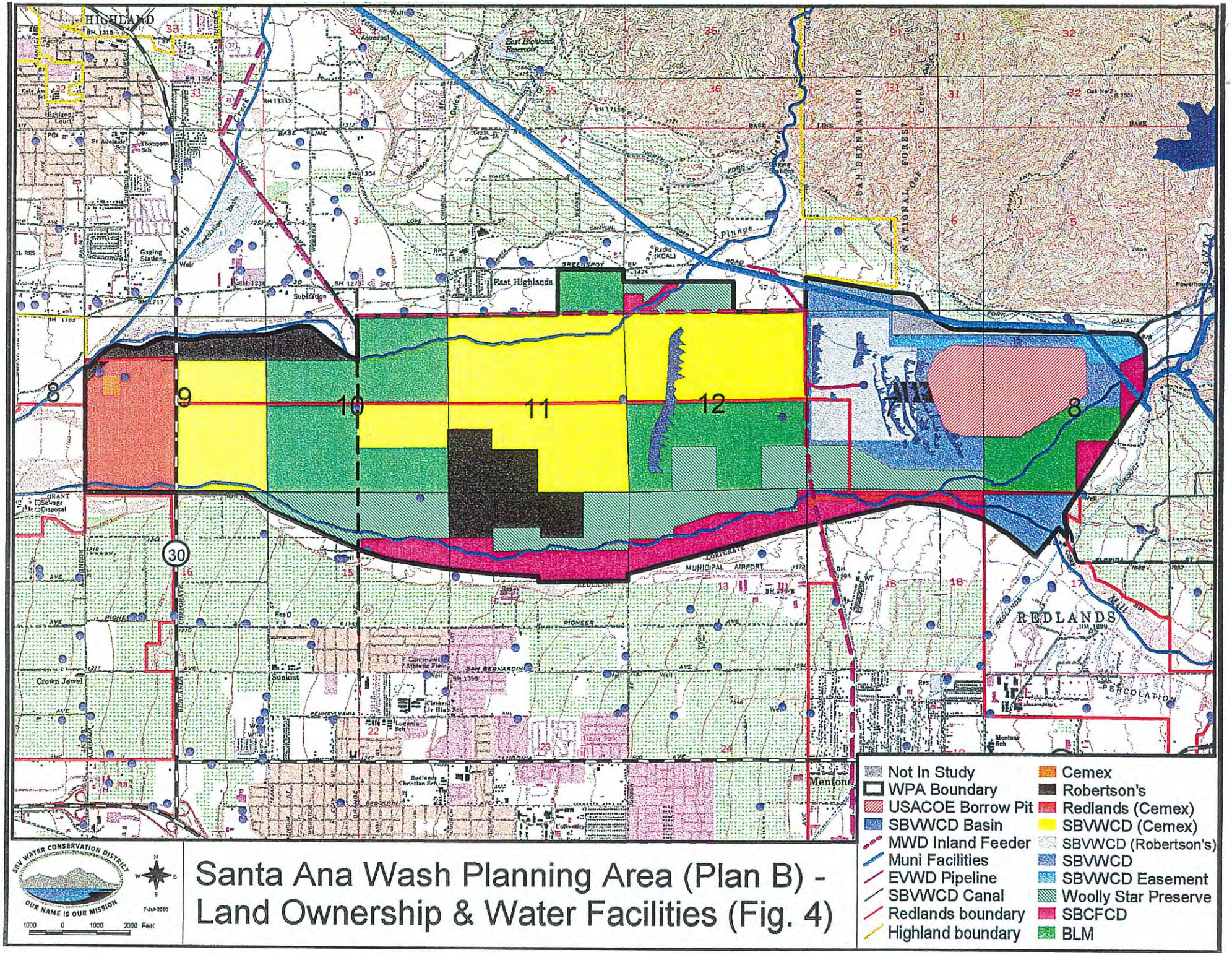
Santa Ana Wash Planning Area (Plan B) - Wash Planning Area (Fig. 2)

- Highway
- Section Lines
- Rivers/Creeks
- WPA Boundary
- SOD Impoundment

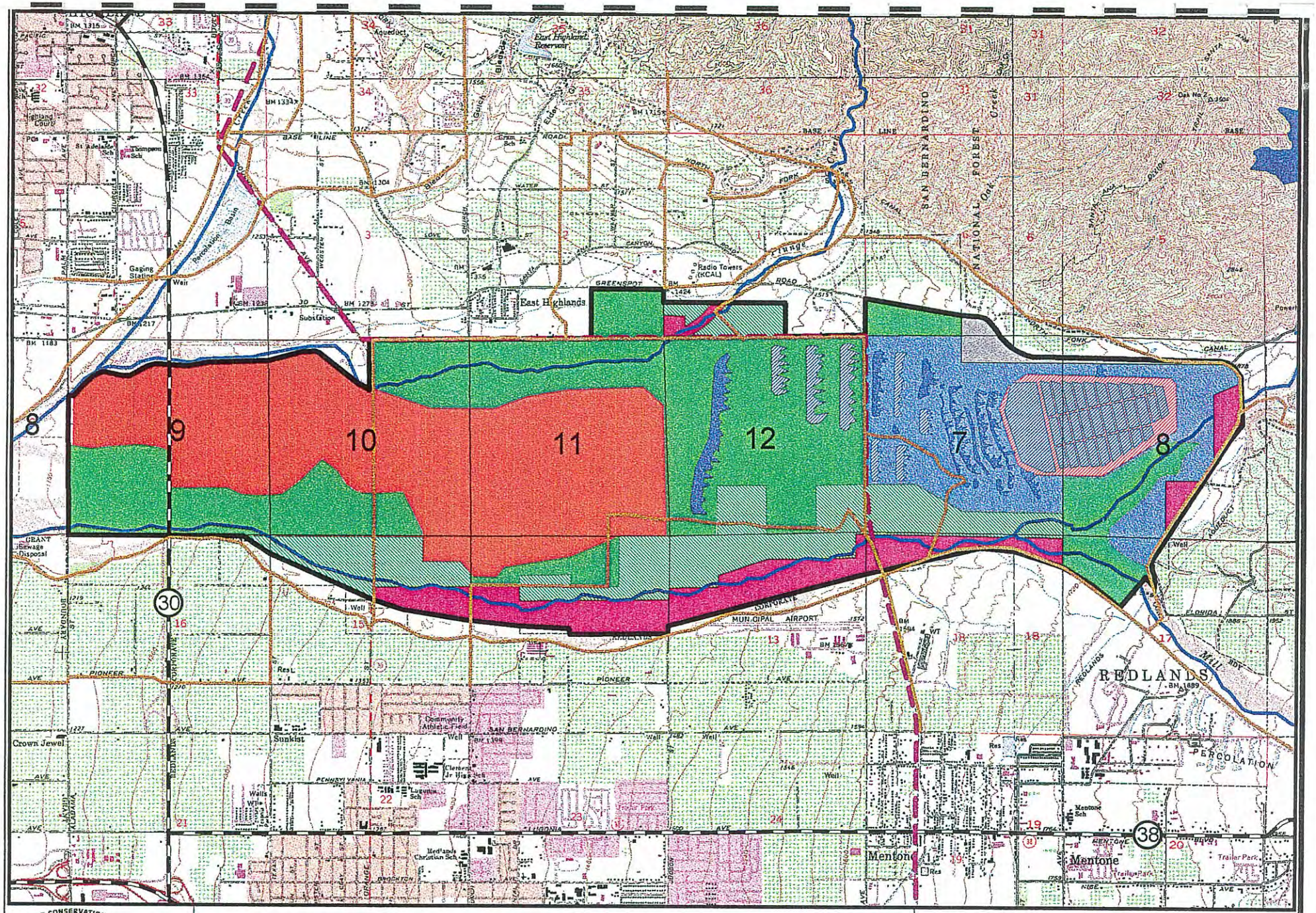


Santa Ana Wash Planning Area (Plan B) - Biological Resources (Fig. 3)

- Pioneer Sage Scrub
- Interm. Sage Scrub
- Mature Sage Scrub
- ▲ Spineflower
- ☆ Woolly Star
- WPA Boundary
- USACOE Borrow Pit
- Woolly Star Preserve
- Poss. K-rat Hab.
- Not In Study



Santa Ana Wash Planning Area (Plan B) - Land Ownership & Water Facilities (Fig. 4)



Santa Ana Wash Planning Area (Plan B) - Land and Habitat Management Plan (Fig. 5)

EXHIBIT "B": TASK FORCE CONTRIBUTION LEVELS

Allocation to the Parties of their share of the costs associated with the Project is as set forth below in the following proportions:

AGENCY	RESPONSIBILITY FOR FINANCIAL CONTRIBUTION
CEMEX	24.774
ROBERTSON'S READY MIX	24.774
SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT	24.644
EAST VALLEY WATER DISTRICT	3.226
REDLANDS UTILITIES DEPARTMENT	3.226
COUNTY OF SAN BERNARDINO	6.452
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT	6.452
CITY OF REDLANDS	6.452

Should the cost to complete financing of the Project exceed the total current estimated charges set forth above, the Task Force will have the responsibility of obtaining any required additional funding from each of the Parties. Any such additional funding shall be assessed to those Parties in the above-mentioned proportions, or as otherwise determined by the Task Force.

Note that in the event the City of Highland joins the Task Force as a Regular Member pursuant to the provisions of Section 2 (H) of this Agreement, the contribution levels set forth here will be superseded by the levels set forth in Exhibit "B-1."

EXHIBIT "B-1": TASK FORCE CONTRIBUTION LEVELS IN THE EVENT CITY OF HIGHLAND JOINS AS A REGULAR MEMBER

Allocation to the Parties of their share of the costs associated with the Project is as set forth below in the following proportions:

AGENCY	RESPONSIBILITY FOR FINANCIAL CONTRIBUTION
CEMEX	23.272
ROBERTSON'S READY MIX	23.272
SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT	23.152
EAST VALLEY WATER DISTRICT	3.030
REDLANDS UTILITIES DEPARTMENT	3.030
COUNTY OF SAN BERNARDINO	6.061
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT	6.061
CITY OF HIGHLAND	6.061
CITY OF REDLANDS	6.061

Should the cost to complete financing of the Project exceed the total current estimated charges set forth above, the Task Force will have the responsibility of obtaining any required additional funding from each of the Parties. Any such additional funding shall be assessed to those Parties in the above-mentioned proportions, or as otherwise determined by the Task Force.

This schedule of contribution levels shall only become effective if the City of Highland joins the Task Force as a Regular Member pursuant to the provisions of Section 2 (H) of this Agreement.

EXHIBIT "C": PROJECT FLOW DIAGRAM

10/03/01
02/13/02
Special

EXHIBIT "C"

PROPOSED LAND MANAGEMENT & HABITAT CONSERVATION PLAN "PROJECT"

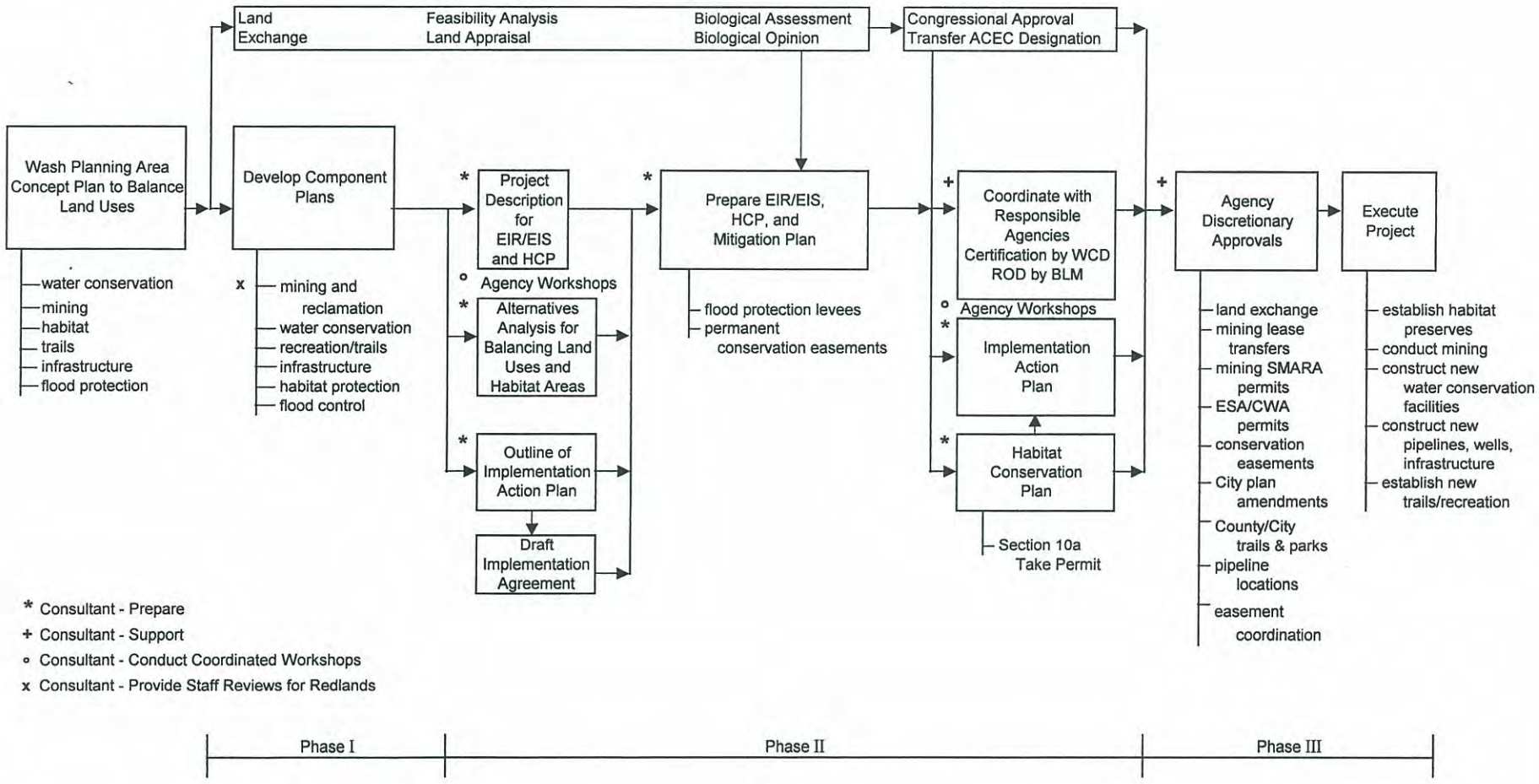


EXHIBIT "C-1": PROJECT FLOW DIAGRAM IN THE EVENT CITY OF HIGHLAND JOINS AS A REGULAR MEMBER

EXHIBIT "C-1"

10/03/01
02/13/02
Special

PROPOSED LAND MANAGEMENT & HABITAT CONSERVATION PLAN "PROJECT"

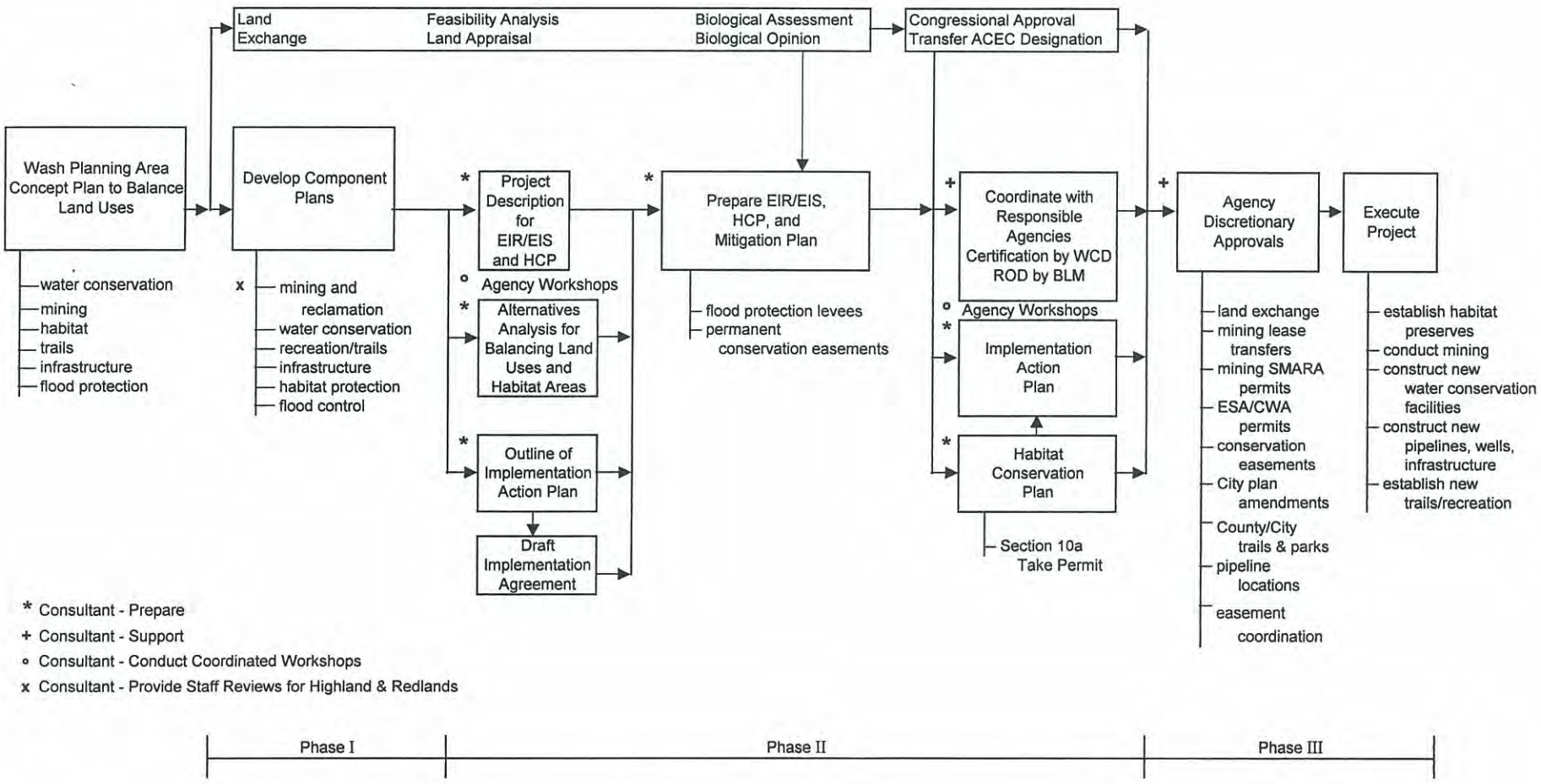


EXHIBIT "D": REVISIONS TO AGREEMENT IN THE EVENT CITY OF HIGHLAND JOINS AS A REGULAR MEMBER

In the event the City of Highland joins the Task Force as a Regular Member pursuant to, and in compliance with, the provisions of Section 2 (H) of this agreement, the parties hereto have agreed to certain modifications of the text of the Task Force Agreement, which will serve as amendments thereto, effective immediately and prospectively upon inclusion of the City of Highland as a Regular Member pursuant to Section 2 (H). These amendments are set out below:

Section 1 (A) 3): A Recreation Plan, which coordinates the planning and development of trails, parks, and public recreation areas, which will be provided by Conservation District, San Bernardino County, Highland, and Redlands.

Section 1 (A)(4): An Infrastructure Plan, which describes the location of pipelines, utility corridors, roads, bridges, highways, and communication facilities, which will be provided by the Conservation District, San Bernardino County, Highland, and Redlands.

Section 1 (F): Task Force submit the EIR/EIS, Implementation Action Plan, and Habitat Conservation Plan to the appropriate agencies for their action and, if adopted, subsequent implementation. The EIR/EIS shall not be certified by the Lead Agency as to those portions of the Project occurring within the jurisdictional boundaries of the City of Highland if, prior to the time the Lead Agency certifies the EIR/EIS, it has been disapproved by the City Council of the City of Highland. The EIR/EIS shall not be certified by the Lead Agency as to those portions of the Project occurring within the jurisdictional boundaries of the City of Redlands if, prior to the time the Lead Agency certifies the EIR/EIS, it has been disapproved by the City Council of the City of Redlands.

Section 2 (B)(2): The California Department of Water Resources (DWR), the California Department of Fish and Game (DFG), the United States Fish and Wildlife Service (USFWS), and County of Orange are hereby designated as Advisory members of the Task Force.

Section 4 (B)(1): Revise Section 4 (B)(1). to read as follows:

Serve as the Lead Agency under CEQA and as assistant to BLM, which is the Lead Agency under NEPA, provided, however, that on issues relating to definition of level of significance for impacts, existence of and mitigation for significant adverse environmental impacts, and formulation of a mitigation monitoring program for those portions of the Project requiring permits under SMARA, the Project Manager shall accept and incorporate into the EIR/EIS the collective determinations of the applicable agencies with SMARA permitting authority for such aspects of the Project, and in the absence of any agreement by such agencies, shall refer determination of such issues to the Task Force;

Exhibit "B": Replace with Exhibit "B-1."

EXHIBIT "D": REVISIONS TO AGREEMENT IN THE EVENT CITY OF HIGHLAND JOINS AS A REGULAR MEMBER (CONTINUED)

Exhibit "C": Replace with Exhibit "C-1."

UPPER SANTA ANA RIVER WASH LAND MANAGEMENT AND HABITAT CONSERVATION PLAN TASK FORCE ("Task Force")

LIST OF TASK FORCE MEMBER AGENCIES

(December 10, 2002)

REGULAR MEMBERS

Member Agency	Governing Member	Technical Member
City of Highland		
City of Redlands		
City of Redlands Municipal Utilities		
County of San Bernardino		
County Flood Control District		
East Valley Water District		
Robertson's Ready Mix, Ltd.		
CEMEX, USA		
U.S. Bureau of Land Management		
Water Conservation District		

ADVISORY MEMBERS

Member Agency	Member
U.S. Army Corps of Engineers	
U. S. Fish & Wildlife Service	
California Dept of Fish & Game	
California Dept of Water Resources	
County of Orange	

SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

1630 West Redlands Boulevard, Suite A
Redlands, CA 92373-8032
(909) 793-2503
Fax: (909) 793-0188

P.O. Box 1839
Redlands, CA 92373-0581
Email: info@sbvwcd.dst.ca.us

December 10, 2002

Jack Woodbury
San Bernardino Valley WCD
31919 Florida Street
Mentone, CA 92346

RE: Agreement to Form the Upper Santa Ana River Wash Land Management and Habitat Conservation Plan Task Force

Dear Mr. Woodbury:

As previously announced, all of the required signatures have been obtained for the Task Force Agreement ("Agreement") referenced above. Attached are the signature pages that you should insert in your copy of the Agreement. On page 1 of the Agreement, you should write in "20th" day of "November" 2002 as the effective day. In accordance with the Agreement, the San Bernardino Valley Water Conservation District ("District") shall be the Task Force Project Manager.

As a reminder, the Agreement was prepared to accommodate the City of Highland because there was a potential delay in their decision to participate. As we now know, the City of Highland agreed to participate several months ago. Therefore, please annotate the appropriate paragraphs of the Agreement to refer to Exhibit "D," "*Revisions to Agreement in the Event City of Highland Joins as a Regular Member*."

Section 2 of the Agreement identifies the criteria for Regular and Advisory Members of the Task Force, and stipulates that each Regular Member will have two representatives: one to oversee and contribute to the technical/staff aspects and one from the governing body. The names of those representatives should be forwarded to the Project Manager at this time. Advisory Members should also submit representative names to the Project Manager at this time. A list of current Regular and Advisory Members is attached.

On December 20, the former Wash Committee Technical Advisory Committee (TAC) will meet for a Pre-final review of the proposed scope of work prior to the Project Manager issuing a Notice to Proceed to LSA Associates, Inc., who will prepare the environmental documentation for the Concept Plan. Following that review, an invoice will be submitted to each Regular member for its share of the consultant's cost, based

on the distribution of costs shown on Exhibit "B-1": *Task Force Contribution Levels in the Event City of Highland Joins as a Regular Member*, of the Agreement, and attached hereto.

The District is looking forward to starting calendar year 2003 by issuing a Notice to Proceed to prepare the environmental documentation. Please note that the first task in the scope of work is to complete the Project Description. Therefore, please review Section 1 of the Agreement as a reminder of the responsibilities of the Task Force and the Regular Members for preparing the "Component Plans." When the Notice to Proceed is issued, we will not want to delay the consultant by not having Component Plans ready for review. It has already been 6 years since we started developing the Concept Plan. As Project Manager, we will do our best to assure the environmental documentation is prepared within the estimated 18 months.

We thank you for your past and continued perseverance and willingness to work toward a coordinated plan that we all know intuitively is the right thing to do. We look forward to continued good working relations among the Task Force members.

Sincerely,

D. Burnell Cavender, AICP
General Manager

Enclosures: Signature Pages (9)
List of Regular and Advisory Members
Exhibit "B-1"

Copy to: David B. Cosgrove, Esq, Rutan & Tucker

PROPOSED

LAND MANAGEMENT AND HABITAT CONSERVATION PLAN FOR THE UPPER SANTA ANA RIVER WASH

EXECUTIVE SUMMARY

PREPARED FOR THE
SANTA ANA RIVER WASH AREA COORDINATED
PLANNING ACTIVITIES COMMITTEE

BY

STAFF OF THE
SAN BERNARDINO VALLEY WATER CONSERVATION DISTRICT

APRIL 2001
(Figures Revised December 2001)

PROPOSED LAND MANAGEMENT AND HABITAT CONSERVATION PLAN FOR THE UPPER SANTA ANA RIVER WASH

D. Burnell Cavender, AICP
General Manager
San Bernardino Valley Water Conservation District

Introduction

The land area between the mouth of the Santa Ana River Canyon, down stream of the new Seven Oaks Dam on the east, Interstate 215 (I-215) on the west, the cities of Highland and Redlands to the north and south, respectively, is known locally as the Upper Santa Ana River Wash (Wash) (Fig 1). A part of that Wash, containing approximately 5,200 acres, from the canyon mouth to Alabama Street on the west and bounded by the cities, has been the subject of intense planning the past three years. This area is known as the Wash Planning Area or the "WPA" (Fig 2).

Historically, the Wash was a natural flood plain and alluvial fan. In the past, the flood plain has provided a place to convey frequently devastating flood waters and deposit sediment. The alluvial deposit provides excellent geologic conditions to establish settling basins for percolating surface water to the groundwater basin, providing a significant part of the water supply for the local region. These same geologic conditions provide regionally significant deposits of sand and gravel as classified by the California Department of Conservation, that are used to support the local economy. In recent years, the value of the Wash as habitat for a variety of sensitive, threatened, and endangered species has become more apparent due to the decrease in this type of habitat throughout Southern California (Fig 3). Because the Wash is a unique open space and corridor, the County of San Bernardino (County) and the cities of Highland and Redlands are also planning to establish a series of recreational trails in and around the Wash. These important functions within the Wash, flood control, water conservation, mineral extraction, and wildlife habitat, are often in direct competition for much of the same land. It has been apparent since the early 1980s that a land management plan for the future use of the Wash would be needed to maintain other public services (water supply facilities, transportation and utility corridors, and recreation/trails), provide areas for the extraction of valuable construction materials, and preserve declining sensitive habitats.

In 1993, representatives of numerous agencies, including water, mining, flood control, wildlife and municipal interests, formed a Wash Committee to address local mining issues. Subsequently, the role of the Committee was expanded to address all the land functions in the Wash. The Wash Committee began meeting again in 1997 to determine how to use the WPA to accommodate all the important functions identified above. A Policy Action Committee (PAC) was established consisting of elected officials from the County, cities of Highland and Redlands, and the San Bernardino Valley Water Conservation District (District), and the Field Manager from the U.S. Bureau of Land Management (BLM). A Technical Advisory Committee (TAC) was formed with

representatives of the PAC agencies and other water, mining, flood control, and wildlife interests. The District chairs and provides staff support for the Committees.

The TAC, in concept, wiped the WPA clean of land ownership lines (Fig 4) and began anew to decide how the land could best be used. As a result of extensive workshops during 1998 and 1999, a conceptual Coordinated WPA map has been developed. As expected, the way the land might best be used and the way the land use was planned were not the same, nor does it conform to current land ownership. For example, the TAC found that some land proposed for mining was better suited for joint use by water conservation and wildlife habitat while other areas proposed for habitat preservation could be used better for mining. It became apparent that to make a plan work, land ownership would have to change, in particular, a land transfer or exchange between the BLM and the District, and areas leased by the District for mining.

A general consensus of the TAC was reached in early 2000 on the areas within the WPA designated for the specified land uses, which is the basis of the Land Management and Habitat Conservation Plan (Plan) (Fig 5). As stated, the proposed designations for land use crossed land ownership (3 public and 2 private) and land use authority lines (2 cities and the County). The TAC determined that mining expansion is best addressed by consolidating the future mining activity into one large area adjacent to existing mining operations within the western half of the WPA. This focuses extraction activities on lands currently disturbed by mining and lands with the least long-term wildlife habitat value. Furthermore, the TAC determined that portions of the BLM land designated as Areas of Critical Environmental Concern (ACEC) were either previously disturbed or were fragmented by adjacent mining activities, and thus would be better suited for mining expansion. Some of the most intact, viable wildlife habitat areas are contained within lands that are leased for future mining and currently used for water conservation. The TAC concluded that some of these lands were best suited for joint use as water and habitat conservation rather than mining. For example, the up-gradient side of a percolation basin dike could be wetted and periodically contain water for water-dependent species; whereas, the down-gradient side could generally remain undisturbed, except for maintenance and repair of the percolation basin dike and, therefore, could support other wildlife species common to the WPA.

Refinements in land use boundaries were made and agency and jurisdictional coordination was accomplished. The result of this effort is a proposed Plan that designates areas of the WPA for specific uses. The Plan will allow the existing and future Wash activities and land functions to occur and establish habitat preserves.

It is imperative that the principles that will govern the use, management, and conservation of the WPA be set forth in legally binding documents to which all concerned parties can agree. The PAC believes that there are sufficient lands in the WPA that can be divided equitably among the advocates to accommodate the needs for water conservation and supply facilities, aggregate extraction, and flood protection, while providing land for wildlife habitat and recreation.

It is equally important to note that if this coordinated Plan is not implemented, the consequences could be very grave for each of the primary use groups. Without the Plan, attempts to expand water conservation to meet future demands, develop additional aggregate resources, or effectively protect habitat will likely be held up by legal proceedings. Such action could result in

piecemeal planning, thus impairing the ability to reach an effective compromise. If local land use agencies make decisions regarding mining development in the WPA, without considering a coordinated plan, there could be greater environmental degradation and reduced ability to meet future water supply demands. On the other hand, if local officials make land use decisions that significantly restrict water conservation activities and mining, the reduced availability of water and aggregate resources may impact the economic development of the region. The affect of not implementing this Plan is that none of the groups would be able to accomplish its goals.

Proposed Project Description Summary

The proposed project is a Land Management and Habitat Conservation Plan (Plan) for the Upper Santa Ana River Wash Planning Area. The land area addressed in this Plan is part of the overall alluvial fan and flood plain located along the Santa Ana River one mile downstream from the new Seven Oaks Dam between the cities of Highland on the north and Redlands to the south. The City of San Bernardino, to the northwest, is the largest city in the San Bernardino Valley. The WPA covers approximately 5,200 acres and starts at the canyon mouth at Greenspot Road, extends for some six miles to Alabama Street, and is as much as two miles wide.

The Plan will coordinate and accommodate existing ongoing and anticipated future activities planned to occur in the WPA, establish habitat preserve areas, and provide recreational trails. Each function will occupy designated specific areas within the WPA best suited for that function and will also accommodate the other competing uses for the overall benefit of the WPA. These existing and future activities include the following:

- Water conservation of both native and (when necessary) imported water resources for groundwater basin replenishment to augment public water supplies;
- Flood control, and management of the Seven Oaks Dam releases;
- Aggregate extraction and processing;
- Protection and conservation of sensitive and listed native species and habitat;
- Recreation planning including a portion of the Santa Ana River trail system; and
- Utilities, transportation, and water supply corridors and facilities.

The final approved Plan, its associated actions and permits, and environmental review will provide the necessary information for jurisdictional approvals for the described activities to move forward. The Plan, when implemented will be considered a "Win-Win-Win" for all the water, utility and service functions, mineral resource management, and environmental resource preservation.

As staff for the Wash Committee, the District invites your questions and support for this inter-relational concept plan. You may call me at 909-793-2503, or write to me at P.O. Box 1839, Redlands, CA 92373.

Coordinated Operations Agreement

This Coordinated Operations Agreement ("**Agreement**") is entered into and effective this 9 day of September, 2013 (the "**Effective Date**") by and between the San Bernardino Municipal Water Department (the "**Department**") and San Bernardino Valley Municipal Water District ("**Valley District**"). The Department and Valley District are each sometimes referred to herein as a "**Party**" and are collectively referred to as the "**Parties**."

Recitals

A. The Department owns certain water delivery facilities serving the residents of the City of San Bernardino, including certain groundwater wells, the Encanto pumping station, the 10th Street Pipeline, and the Virginia Street Pipeline, all of which are identified more fully on the map attached hereto as **Exhibit A**, which is incorporated herein by reference ("**Department Facilities**").

B. By agreement dated June 15, 2005, Valley District purchased 61.98% of the capacity in Department's 10th Street Transmission Main and 46.73% of the capacity in Department's Virginia Street Transmission Main.

C. Valley District owns certain water delivery facilities in and through the City of San Bernardino which are identified more fully on the map attached hereto as **Exhibit A**, which is incorporated herein by reference ("**Valley District Facilities**").

D. At Valley District's request, the Department has been operating and making Department deliveries utilizing Valley District's Baseline Feeder Extension South Pipeline.

E. Both the Department and Valley District from time to time have unused capacity in their respective water delivery facilities.

F. The Parties share an interest in using their respective facilities to increase operational flexibility, improve water supply reliability in their respective service areas, encourage the efficient use of capacity within the each Party's water delivery system and provide the public with more reliable water service as efficiently as possible.

G. The Parties wish to enable each other to make use of unused capacity in their respective facilities whenever possible and so wish to provide for the coordinated operation of those facilities.

H. The Parties agree that if either Party uses the other's water delivery facilities to deliver water, that Party using the facilities should be responsible for the increased cost associated with that Party's use.

I. The Parties wish to continue the spirit of cooperation they enjoy by memorialing in this Agreement their desire to share their respective water production, transmission and distribution facilities.

Agreements

The Parties agree as follows:

1. *Term.* This Agreement shall have an initial term of twenty-five (25) years from its Effective Date and shall automatically renew for subsequent ten-year terms thereafter unless terminated as provided for in paragraph 2 below.

2. *Termination.* This Agreement may be terminated by either Party: (i) at the end of the initial term or any subsequent term, with or without cause, upon written notice provided at least one year prior to the end of the initial or subsequent term; or (ii) for cause upon 90-days' written notice, *provided* that the Parties have, prior to the notice of termination, attempted to resolve the dispute as provided in paragraph 13.cbelow.

3. *Other Agreements.* This agreement is not intended to modify or change any other agreement the Parties may have together.

4. *Facilities Subject to This Agreement.* This Agreement governs the Parties' coordinated operation and use of the Department Facilities and the Valley District Facilities as described in Exhibit A, respectively. The Parties may amend this Agreement to add additional water delivery facilities owned by either Party upon the written consent of the other Party. Neither Party shall unreasonably delay or deny its consent for the addition of facilities owned by the other Party.

5. *Priority.* Save as may be provided by any other written agreement existing as of the Effective Date of this Agreement, each Party shall have priority for the use of the other Party's facilities, as set forth in Exhibit A, over any non-Party to this Agreement. Nothing in this Agreement, however, shall be construed to create a right by either Party to any specific share of the capacity in the other Party's facilities except for that capacity already purchased in Department's facilities by Valley District.

6. *Coordinated Operations.* This Agreement provides for the Parties' coordinated use of unused capacity within their respective water delivery facilities.

a. *Operation of Department Facilities.* The Department shall operate the Department Facilities to serve Valley District as follows:

(1) When Valley District requests a change to the current flow rate in one or more of the Department Facilities, Valley District shall request that change in writing at least 24 hours in advance, except in case of emergency.

(2) If the Valley District request is for flow through facilities in which Valley District has purchased capacity, Department's staff shall make the operational changes needed to provide the requested flow rate to Valley District for the duration requested.

(3) If the Valley District request is for flow through Department facilities in which Valley District does not own capacity and Department, in its sole discretion, determines that there will be unused and available capacity in that Department Facility, the Department's staff shall make the changes needed to provide the requested flow rate to Valley District for the duration requested.

b. *Operation of Valley District's Baseline Feeder Extension South Pipeline.* The Department shall operate the Baseline Feeder Extension South Pipeline on behalf of Valley District as follows:

(1) If the Department wishes to change the flow rate in the Valley District Facilities to make better use of unused and available capacity, the Department will provide Valley District with at least 24 hours' written notice of such change in flow rate. Valley District may, in its sole discretion, veto such modification of flow rates if Valley District believes that the modification in flow rates would not serve the interests of Valley District or its other customers.

(2) Valley District will coordinate deliveries of water with the Department staff operating the pipeline.

(3) The Baseline Feeder Extension South Pipeline presently conveys potable drinking water for the Department. Department agrees to fulfill all monitoring and other requirements associated with operating a potable water line per all applicable state and federal laws.

c. *Operation of other Valley District Facilities.* Valley District shall operate Valley District Facilities to serve the Department as follows:

(1) If the Department wishes to change the flow rate of a Valley District Facility to make better use of unused and available capacity, the Department will provide Valley District with at least 24 hours' written notice of such a change in flow rate. Valley District may, in its sole discretion, veto such modification of flow rates if Valley District believes that the modification in flow rates would not serve the interests of Valley District or its other customers.

(2) If the Department request is for flow through Valley District facilities, Valley District, in its sole discretion, determines that there will be unused and available capacity in that Valley District Facility, the Valley District

staff shall make the changes needed to provide the requested flow rate to the Department for the duration requested.

7. *Establishment of Joint Operations Committee.* The Parties shall establish and participate in a Joint Operations Committee (the "**JOC**") to serve in an advisory capacity to both Parties regarding their coordinated operation of the Department Facilities and the Valley District Facilities. The JOC shall establish which costs for the Department Facilities and the Valley District Facilities are eligible for reimbursement, and shall perform such other functions as determined by the Parties. The JOC shall meet at least twice a year to review the financial and water accounting needed to implement this Agreement.

8. *Maintenance.* Valley District shall be responsible for performing routine maintenance on Valley District Facilities, and Department shall be responsible for performing routine maintenance on Department Facilities. However, each Party shall be reimbursed for any JOC approved maintenance costs associated with the shared use of the facilities as described in Section 9 below.

9. *Eligible Reimbursement Costs.* Each Party will reimburse the other Party for its use of that Party's facilities as follows:

a. *Valley District Facility Replacement Costs.* Since Valley District's facilities were constructed and paid for entirely by Valley District, Valley District shall pay all replacement costs.

b. *Valley District Baseline Feeder Extension South Pipeline.* The Department will continue to provide and pay for all operations costs associated with the Baseline Feeder Extension South Pipeline provided that the Department is the sole user of this facility. At such time that Valley District and/or its partner Western Municipal Water District begin to operate this facility, the Department shall pay its proportional share of the operations costs as calculated in paragraph c, below.

c. *Valley District Operations Costs.* The Department will reimburse Valley District for **Fixed Costs** and **Variable Costs** associated with the Department's use of the Valley District Facilities, as provided in this paragraph. Department's total reimbursement to Valley District shall be the sum of the Fixed Cost and the Variable Cost in each calendar year.

(1) *Fixed Costs.* **Fixed Costs** shall consist of the sum of: (i) sampling costs, and (ii) permit compliance costs incurred by Valley District in the operation of its Facilities. Department shall pay Valley District a portion of total Fixed Costs for the operation of the Valley District Facilities that is equal to the proportion of the total capacity of the Valley District Facilities which is authorized for Department's use in that calendar year.

(2) *Variable Costs.* **Variable Costs** shall consist of the sum of: (a) energy costs associated with the use of the Valley District Facilities; (b) repair costs; and (c) personnel costs for the use of the Valley District Facilities.

Department shall pay Valley District the portion of the total Variable Costs for the operation of the Valley District Facilities that is equal to the proportion of the total capacity of the Valley District Facilities which is authorized for Department's use in that calendar year.

d. *Department Facilities.* Valley District will reimburse Department for **Fixed Costs** and **Variable Costs** associated with Valley District's use of the Department Facilities, as provided in this paragraph. Valley District's total reimbursement to the Department shall be the sum of the Fixed Cost and the Variable Cost in each calendar year.

(1) *Replacement Costs.* For all of the Department facilities in which Valley District has purchased capacity, Valley District shall pay its proportionate share of any replacement costs.

(2) *Fixed Costs.* **Fixed Costs** shall consist of the sum of: (i) sampling costs, and (ii) permit compliance costs incurred by the Department in the operation of the Department Facilities. Valley District shall pay the Department a portion of total Fixed Costs for the operation of the Department Facilities that is equal to the capacity which Valley District has purchased in Department facilities or its proportionate share, based on the capacity that has been authorized for Valley District use in that calendar year.

(3) *Variable Costs.* **Variable Costs** shall consist of the sum of: (a) energy costs associated with the use of the Department Facilities; (b) repair costs and (c) personnel costs for the use of the Department Facilities. Valley District shall pay the Department a portion of the total Variable Costs for the operation of the Department Facilities that is equal to the proportion of the total flows conveyed through the Department Facilities during a calendar year that were conveyed at the request of Valley District in that year.

e. *Fair Compensation.* For the purposes of Water Code Section 1810, both Parties agree that the payment structure set forth in this paragraph 8 constitutes fair compensation for each Party's use of unused capacity in the other Party's facilities.

10. *Invoices.* Each Party shall invoice the other Party for eligible reimbursement costs, as described in paragraph 8 above, annually in arrears on each March 1. Invoices shall include a full cost accounting, and must indicate, in reasonable detail, the cost of each action undertaken to operate and maintain the facilities in question. Invoices shall include all information reasonably necessary for each Party to confirm the other Party's calculation of reimbursement costs. In the event that either Party objects to any costs identified on an invoice, that Party shall pay the undisputed costs and shall invoke the dispute resolution process set forth in paragraph 13.c below for the objectionable costs.

11. *Payment Schedule.* Within 45 days of the date that an invoice is provided to a Party, the Party shall pay the invoicing Party for any costs that are not subject to an objection.

12. *Indemnification.*

a. *Indemnification by Department.* The Department shall indemnify, defend and hold harmless Valley District, its directors, officers, employees and agents from and against all damages, liabilities, claims, actions, demands, costs and expenses (including, but not limited to, costs of investigations, lawsuits and any other proceedings whether in law or in equity, settlement costs, attorneys' fees and costs), and penalties or violations of any kind, which arise out of, result from, or are related to the implementation of this Agreement by Department.

b. *Indemnification by Valley District.* Valley District shall indemnify, defend and hold harmless Department, its directors, officers, employees and agents from and against all damages, liabilities, claims, actions, demands, costs and expenses (including, but not limited to, costs of investigations, lawsuits and any other proceedings whether in law or in equity, settlement costs, attorneys' fees and costs), and penalties or violations of any kind, which arise out of, result from, or are related to the implementation of this Agreement by Valley District.

c. *Indemnification Procedures.* Any Party that is an indemnified party (the "**Indemnified Party**") that has a claim for indemnification against another Party (the "**Indemnifying Party**") under this Agreement, shall promptly notify the Indemnifying Party in writing, *provided, however,* that no delay on the part of the Indemnified Party in notifying the Indemnifying Party shall relieve the Indemnifying Party from any obligation unless (and then solely to the extent) the Indemnifying Party is prejudiced. Further, the Indemnified Party shall promptly notify the Indemnifying Party of the existence of any claim, demand, or other matter to which the indemnification obligations would apply, and shall give the Indemnifying Party a reasonable opportunity to defend the same at its own expense and with counsel of its own selection, *provided* that the Indemnified Party shall at all times also have the right to fully participate in the disputed matter at its own expense. If the Indemnifying Party, within a reasonable time after notice from the Indemnified Party, fails to defend a claim, demand or other matter to which the indemnification obligations would apply, the Indemnified Party shall have the right, but not the obligation, to undertake the defense of, and to compromise or settle (exercising reasonable business judgment), the claim or other matter, on behalf, or for the account, and at the risk, of the Indemnifying Party. If the claim is one that cannot by its nature be defended solely by the Indemnifying Party, then the Indemnified Party shall make available all information and assistance to the Indemnifying Party that the Indemnifying Party may reasonably request.

13. *Administration of Agreement.*

a. *Recordation of Agreement.* Valley District shall, within ten days of the Effective Date of this Agreement, cause this Agreement to be recorded in the Official Records of the County of San Bernardino. Valley District shall provide the Department with a recorded copy of this Agreement promptly upon the receipt of such copy from the County of San Bernardino.

b. *Books and Records.* Each Party shall have access to and the right to examine any of the other Party's pertinent books, documents, papers or other records (including, without limitation, records contained on electronic media) relating to the performance of that Party's obligations pursuant to this Agreement. The Parties shall each retain all such books, documents, papers or other records to facilitate such review. Access to each Party's books and records shall be during normal business hours only. Nothing in this paragraph shall be construed to operate as a waiver of any applicable privileges.

c. *Disputes.* The Parties recognize that there may be disputes regarding the obligations of the Parties or the interpretation of this Agreement. The Parties agree that they may attempt to resolve disputes as follows:

(1) *Statement Describing Alleged Violation of Agreement.* A Party alleging a violation of this Agreement (the "**Initiating Party**") shall provide a written statement describing all facts that it believes constitute a violation of this Agreement to the Party alleged to have violated the terms of this Agreement (the "**Responding Party**").

(2) *Response to Statement of Alleged Violation.* The Responding Party shall have sixty days from the date of the written statement to prepare a written response to the allegation of a violation of this Agreement and serve that response on the Initiating Party or to cure the alleged violation to the reasonable satisfaction of the Initiating Party. The Initiating Party and the Responding Party shall then meet within thirty days of the date of the response to attempt to resolve the dispute amicably.

(3) *Mediation of Dispute.* If the Initiating Party and the Responding Party cannot resolve the dispute within ninety days of the date of the written response, they shall engage a mediator, experienced in water-related disputes, to attempt to resolve the dispute. Each Party shall ensure that it is represented at the mediation by a Commissioner or Director. These representatives of the Initiating Party and the Responding Party may consult with staff and/or technical consultants during the mediation and such staff and/or technical consultants may be present during the mediation. The costs of the mediator shall be divided evenly between the Initiating Party and the Responding Party.

(4) *Reservation of Rights.* Nothing in this paragraph 13.c shall require a Party to comply with the dispute resolution process contained herein and each Party retains and may exercise at any time all legal and equitable rights

and remedies it may have to enforce the terms of this Agreement; provided, that prior to commencing litigation, a Party shall provide at least five calendar days' written notice of its intent to sue to all Parties.

14. *No Changes to Water Rights.* This Agreement is an agreement for the coordinated use of the Department Facilities and the Valley District Facilities only. Nothing in this Agreement shall validate, invalidate or modify, in any way, any rights to water held or claimed by a Party.

15. *Ownership of Department and Valley District Facilities.* Nothing in this Agreement shall be construed so as to change the ownership of such facilities or to provide one Party with a real property interest in the facilities of the other Party

16. *General Provisions.*

a. *Authority.* Each signatory of this Agreement represents that s/he is authorized to execute this Agreement on behalf of the Party for which s/he signs. Each Party represents that it has legal authority to enter into this Agreement and to perform all obligations under this Agreement.

b. *Amendment.* This Agreement may be amended or modified only by a written instrument executed by each of the Parties to this Agreement.

c. *Jurisdiction and Venue.* This Agreement shall be governed by and construed in accordance with the laws of the State of California, except for its conflicts of law rules. Any suit, action, or proceeding brought under the scope of this Agreement shall be brought and maintained to the extent allowed by law in the County of San Bernardino, California.

d. *Headings.* The paragraph headings used in this Agreement are intended for convenience only and shall not be used in interpreting this Agreement or in determining any of the rights or obligations of the Parties to this Agreement.

e. *Construction and Interpretation.* This Agreement has been arrived at through negotiations and each Party has had a full and fair opportunity to revise the terms of this Agreement. As a result, the normal rule of construction that any ambiguities are to be resolved against the drafting Party shall not apply in the construction or interpretation of this Agreement.

f. *Entire Agreement.* This Agreement constitutes the entire agreement of the Parties with respect to the subject matter of this Agreement and supersedes any prior oral or written agreement, understanding, or representation relating to the subject matter of this Agreement.

g. *Partial Invalidity.* If, after the date of execution of this Agreement, any provision of this Agreement is held to be illegal, invalid, or unenforceable under present or future laws effective during the term of this Agreement, such provision shall be

fully severable. However, in lieu thereof, there shall be added a provision as similar in terms to such illegal, invalid or unenforceable provision as may be possible and be legal, valid and enforceable.

h. *Successors and Assigns.* This Agreement shall be binding on and inure to the benefit of the successors and assigns of the respective Parties to this Agreement. No Party may assign its interests in or obligations under this Agreement without the written consent of the other Parties, which consent shall not be unreasonably withheld or delayed.

i. *Waivers.* Waiver of any breach or default hereunder shall not constitute a continuing waiver or a waiver of any subsequent breach either of the same or of another provision of this Agreement and forbearance to enforce one or more of the remedies provided in this Agreement shall not be deemed to be a waiver of that remedy.

j. *Attorneys' Fees and Costs.* The prevailing Party in any litigation or other action to enforce or interpret this Agreement shall be entitled to reasonable attorneys' fees, expert witnesses' fees, costs of suit, and other and necessary disbursements in addition to any other relief deemed appropriate by a court of competent jurisdiction.

k. *Necessary Actions.* Each Party agrees to execute and deliver additional documents and instruments and to take any additional actions as may be reasonably required to carry out the purposes of this Agreement.

l. *Compliance with Law.* In performing their respective obligations under this Agreement, the Parties shall comply with and conform to all applicable laws, rules, regulations and ordinances.

m. *Third Party Beneficiaries.* This Agreement shall not create any right or interest in any non-Party or in any member of the public as a third party beneficiary.

n. *Counterparts.* This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which together shall constitute but one and the same instrument.

o. *Notices.* All notices, requests, demands or other communications required or permitted under this Agreement shall be in writing unless provided otherwise in this Agreement and shall be deemed to have been duly given and received on: (i) the date of service if served personally, by facsimile transmission or by electronic mail on the Party to whom notice is to be given at the address(es) provided below, (ii) on the first day after mailing, if mailed by Federal Express, U.S. Express Mail, or other similar overnight courier service, postage prepaid, and addressed as provided below, or (iii) on the third day after mailing if mailed to the Party to whom notice is to be given by first class mail, registered or certified, postage prepaid, addressed as follows:

CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT

City of San Bernardino Municipal Water Department
300 N. D Street, 5th Floor
San Bernardino California 92418
(909) 384-5141
Attention: General Manager

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT:

San Bernardino Valley Municipal Water District
380 E. Vanderbilt Way
San Bernardino, CA
(909) 387-9200
Attn: General Manager

A Party may change its address for notice by providing thirty days' advance written notice of such change to the other Party.

---------- SIGNATURES ON FOLLOWING PAGE ----------

CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT

By: Stacey Aldstadt
Stacey Aldstadt
General Manager

Dated: Sept. August 9, 2013.

Approved as to form only:

By:
Andrew M. Hitchings
Somach Simmons & Dunn

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

By: Douglas D. Headrick
Douglas Headrick
General Manager

Dated: Aug. 20, 2013.

Approved as to form only:

By:
David R.E. Aladjem
Downey Brand LLP

C: DWR IRWM Plan Standards Form

IRWM Plan Review Form

(Per 2016 Plan Standards)

IRWM Planning Region: Upper Santa Ana River Watershed

Regional Water Management Group: Upper Santa Ana River Watershed RWMG

Upper Santa Ana River Watershed Integrated Regional Urban

IRWM Plan Title: Watershed Management Plan

DWR Reviewer:

RESULT: PLAN IS SUFFICIENT

IRWM Plan Standard	Overall Standard Sufficient (yes/no)	One or More Requirement(s) Insufficient
Governance	**Yes**	
Region Description	**Yes**	
Objectives	**Yes**	
Resource Management Strategies	**Yes**	
Integration *	**Yes**	
Project Review Process	**Yes**	
Impact and Benefit	**Yes**	
Plan Performance and Monitoring	**Yes**	
Data Management	**Yes**	
Finance	**Yes**	
Technical Analysis	**Yes**	
Relation to Local Water Planning	**Yes**	
Relation to Local Land Use Planning	**Yes**	
Stakeholder Involvement	**Yes**	
Coordination	**Yes**	
Climate Change	**Yes**	

* If not included as an individual section use Governance, Project Review Process, and Data Management Standards per 2016 Guidelines, p. 52.

Additional Comments:

IRWM Plan Standard: Governance					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
From IRWM 2016 Guidelines	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
The RWMG and individual project proponents who adopted the Plan"	37	**y/n**	y	Part 1, Section 1.5 Part 3	All members of the RWMG have adopted the IRWM Plan (Resolutions of adoption are provided in Appendix A). As noted in Section 1.5 of the IRWM Plan, stakeholders may participate in IRWM Planning without adoption of the IRWM Plan. Given the dynamic nature of the IRWM process, it isn't possible to update the IRWM Plan every time a project proponent adopts the IRWM Plan. Proof of adoption is provided as part of grant applications, as needed.	y
A description of the IRWM governance structure including a discussion of whether or how Native American tribes will participate in the RWMG.	37	**y/n**	y	Part 1, Section 1.3.4	Native American tribes are invited to participate in regional planning efforts via the Basin Technical Advisory Committee meetings.	y
A description of how the chosen form of governance addresses and insures:						
Public outreach and involvement processes	37	**y/n/q**	y	Part 1, Sections 1.3.3 and 1.4	BTAC meetings continue to be open to stakeholders to attend and contribute to the regional planning process. Public participation in the Plan update was also encouraged through stakeholder workshops and public comment on the plan.	y

Effective decision making	37	**y/n/q**	y	Part 1, Section 1.3.2	The Region has a distributed governance structure consisting of the BTAC, whose members provide recommendations to their respective governing bodies who then make decisions regarding water resources planning and projects in the Region, and stakeholders who are encouraged to take part in IRUWMP development and implementation. The BTAC strives for consensus when making decisions, and in those cases where consensus cannot be reached, has provided a forum for discussion and early resolution of water issues in the region. If disputes cannot be resolved at this level, they are elevated to the policy level (governing bodies). The policy level is continuously informed by BTAC agencies' staff.	y
Balanced access and opportunity for participation in the IRWM process	37	**y/n/q**	y	Part 1, Sections 1.3.3	The BTAC invited all stakeholders to participate in development of the Plan. BTAC meetings continue to be open to stakeholders to attend and contribute to the regional planning process. Meeting announcements and agendas are emailed out to a comprehensive mailing list that includes both BTAC members and stakeholders.	y
Effective communication – both internal and external to the IRWM region	37	**y/n/q**	y	Part 1, Sections 1.3.3 and 1.4	Meeting announcements and agendas are emailed out to a comprehensive mailing list that includes both BTAC members and stakeholders. Agendas are also posted on Valley District's website in advance so all agencies, other stakeholders, and interested parties can participate throughout the planning process in discussion of the issues in which they were interested. Stakeholder workshops were held to encourge participation in the latest plan update.	y
Long term implementation of the IRWM Plan	37	**y/n/q**	y	Part 1, Section 8.2	The BTAC will continue to manage implemention of the IRWM plan. BTAC agencies have planned for ongoing support of the region's activities as shown in the financing plan.	y

Coordination with neighboring IRWM efforts and State and federal agencies	37	**y/n/q**	y	Part 1, Sections 1.6	The BTAC participates in the overlapping SAWPA region, coordinates with the neighboring Mojave and San Gorgonio IRWM Regions, and also includes State and federal agencies as stakeholders as part of the Region's email list and as part of project planning.	y
The collaborative process(es) used to establish plan objectives	38	**y/n/q**	y	Part 1, Section 1.4.2	The plan objectives were updated through a collaborative stakeholder process initiated by the BTAC.	y
How interim changes and formal changes to the IRWM Plan will be performed	38	**y/n/q**	y	Part 1, Section 8.5	The BTAC will review progress in meeting plan objectives annually and update the plan as-needed according to an adaptive management process.	y
Updating or amending the IRWM Plan	38	**y/n/q**	y	Part 1, Section 8.5.3	The Plan will be updated at least every every 5 years. Any other updates will be discussed among the BTC agencies at regular meetings.	y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

IRWM Plan Standard: Region Description				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
From IRWM 2016 Guidelines	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
If applicable, describe and explain how the plan will help reduce dependence on the Delta supply regionally.	38	**y/n**	y	Part 1, Section 6.2.1.1		y
Describe watersheds and water systems	38	**y/n**	y	Part 1, Chapter 3		y
Describe internal boundaries	38	**y/n**	y	Part 1, Section 2.2		y
Describe water supplies and demands for minimum 20 year planning horizon	38	**y/n**	y	Part 1, Chapters 4, 5		y
Describe social and cultural makeup,including specific information on DACs and tribal communities in the region and their water challenges.	38	**y/n/q**	y	Part 1, Section 2.3.3	Section 2.3.3 describes the social and cultural makeup of the region. The region is experiencing growth in populatin a change in its economic base. The rest of the section touches on DAC's, housing, and employment. Water challenges in DAC areas nd tribal communities are similar to those faced across the Region.	y
Describe major water related objectives and conflicts **(1)**.	38	**y/n/q**	y	Part 1, Chapter 6	Regional issues, focusing on imported water dependence, groundwater supply, water quality, flood management, aquatic/riparian habitat, and sustainability, are identified in the development of planning objectives.	y
Explain how IRWM regional boundary was determined and why region is an appropriate area for IRWM planning.	38	**y/n/q**	y	Part 1, Chapter 2.1	The Region's boundary is defined by the area of the Upper Santa Ana River Watershed that contributes surface runoff to the Riverside Narrows at U.S. Geological Survey (USGS) Gage 11066460. Disputes over the use of water in the SAR led to the subdivision of the watershed into the Upper SAR watershed and Lower SAR watershed just upstream of Prado Dam.	y
Describe neighboring and/or overlapping IRWM efforts	38	**y/n**	y	Part 1, Section 1.6.1		y
Explain how opportunities are maximized (e.g. people at the table, natural features, infrastructure)for integration of water management activities	38	**y/n**	y	Part 1, Sections 8.1 and 6.4.2	The Region takes advantage of the management group already in place, the BTAC, to maximize opportunities for integration of water management activities. In addition, the Region has identified opportunities for integration of water management strategies, interested institutions and geographic coverage.	y

Describe water quality conditions. If the IRWM region has areas of nitrate, arsenic, perchlorate, or hexavalent chromium contamination, the Plan must include a description of location, extent, and impacts of the contamination; actions undertaken to address the contamination, and a description of any additional actions needed to address the contamination **(2)**.	38	**y/n**	y	Part 1, Section 3.10		y
Describe likely Climate Change impacts on their region as determined from the vulnerability assessment.	38	**y/n**	y	Part 1, Section 2.6		y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10541 (e)(3).

(2) Requirement must be addressed per CWC §10541 (e)(14).

IRWM Plan Standard: Plan Objectives				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
From IRWM 2016 Guidelines	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Through the objectives or other areas of the plan, the 7 items on pg 49 of GL are addressed **(1)**.	49	**y/n**	y	Part 1, Chapter 6	All 7 items on pg 49 of the GL are addressed as discussed throughout Ch.6	y
Describe the collaborative process and tools used to establish objectives: - How the objectives were developed - What information was considered (i.e., water management or local land use plans, etc.) - What groups were involved in the process - How the final decision was made and accepted by the IRWM effort	48 - 50	**y/n**	y	Part 1, Sections 6.3.1 and 1.4.2		y
Identify quantitative or qualitative metrics and measureable objectives: Objectives must be measurable - there must be some metric the IRWM region can use to determine if the objective is being met as the IRWM Plan is implemented. Neither quantitative nor qualitative metrics are considered inherently better **(2)**.	49	**y/n/q**	y	Part 1, Sections 6.3.2 through 6.3.6	Quantifiable metrics were developed for each objective and will be tracked on an annual basis.	y
Explain how objectives are prioritized or reason why the objectives are not prioritized	50	**y/n/q**	y	Part 1, Sections 6.3.7	The Region elected not to prioritize the objectives with the understanding that each objective is equally important relative to the others.	y
Reference specific overall goals for the region: RWMGs may choose to use goals as an additional layer for organizing and prioritizing objectives, or they may choose to not use the term at all.	50	**y/n**	y	Part 1, Sections 6.3.1		y
Address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge.	39	**y/n**	y	Part 1, Sections 6.3.6.1	Objective 5a is to identify projects to address or manage climate change impacts	y
Consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.	39	**y/n**	y	Part 1, Section 6.2.1.1	Though the Region is not near to coast, potential impacts of SLR on imported water supply were considered. The Region's goal of increasing diversification of the water supply portfolio is intended to help the Region respond to this issue and thus adapt to SLR.	y
Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.	39	**y/n**	y	Part 1, Section 6.3.6.2	Objective 5b is to implement projects to reduce or offset energy consumption or reduce GHG emissions associated with water or wastewater systems	y
In evaluating different ways to meet IRWM plan objectives, where practical, consider the strategies adopted by CARB in its AB 32 Scoping Plan1.	39	**y/n**	y	Part 1, Section 6.3.6.2		y

Consider options for carbon sequestration and using renewable energy where such options are integrally tied to supporting IRWM Plan objectives.	39	**y/n**	y	Part 1, Section 6.3.6.2		y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10540 (c).

(2) Requirement must be addressed per CWC §10541 (e).

IRWM Plan Standard: Resource Management Strategies (RMS)				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
From IRWM 2016 Guidelines	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Address which RMS will be implemented in achieving IRWM Plan Objectives **(1)**.	39	**y/n**	y	Part 1, Table 6-2		y
Identify RMS incorporated in the IRWM Plan: Consider all California Water Plan (CWP)RMS criteria (29) listed in Table 3 from the CWP Update 2013	39	**y/n**	y	Part 1, 6.4.1	The IRWM Plan considered the RMS listed on the CWP website (https://water.ca.gov/Programs/California-Water-Plan/Water-Resource-Management-Strategies) as of March 2021. According to the website, these were last updated in 2016. A comparison of the website strategies to CWP Update 2013 finds that the strategies are the same.	y
Consideration of climate change effects on the IRWM region must be factored into RMS. Identify and implement, using vulnerability assessments and tools such as those provided in the Climate Change Handbook, RMS and adaptation strategies that address region-specific climate change impacts. •Demonstrate how the effects of climate change on its region are factored into its RMS. •Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions. • An evaluation of RMS and other adaptation strategies and ability of such strategies to eliminate or minimize those vulnerabilities, especially those impacting water infrastructure systems **(2)**.	39	**y/n**	y	Part 1, 6.4.1, Table 6-2	Table 6-2 provides a cross reference of which strategies identified in the IRWM Plan support the Region's objectives, including the goal: Address climate change through adaptation and mitigation.	Y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10540 (e)(1).

(2) Requirement must be addressed per CWC §10540 (e)(10).

IRWM Plan Standard:Integration					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
From IRWM 2016 Guidelines	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Contains structure and processes for developing and fostering integration[1]: - Stakeholder/institutional - Resource - Project implementation	39	y/n/q	y	Part 1, Sections 6.4.2, 8.1, 8.4.1 and 1.3	The Plan discusses how stakeholders are incorporated into the decision making body of the group. Resource integration is described through the RWMG's efforts in involving stakeholders (public hearings, workshops, etc.). Project development and implementation reflects the regional interests of all stakeholders.	y

1. If not included as an individual section use Governance, Project Review Process, and Data Management Standards per 2016 IRWM Guidelines, p. 52.

IRWM Plan Standard: Project Review Process				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
From IRWM 2016 Guidelines	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Process for projects included in IRWM plan must address 3 components: - procedures for submitting projects - procedures for reviewing projects - procedures for communicating lists of selected projects	39 - 40	**y/n**	y	Part 1, Sections 7.2 and 7.3		y
Does the project review process in the plan incorporate the following factors:						
How a project contributes to plan objectives	40	**y/n**	y	Part 1, Table 7-1		y
How a project is related to Resource Management Strategies identified in the plan.	40	**y/n**	y	Part 1, Table 7-1		y
The technical feasibility of a project.	40	**y/n**	y	Part 1, Table 7-1		y
A projects specific benefits to a DAC water issue.	40	**y/n**	y	Part 1, Table 7-1		y
Environmental Justice considerations.	40	**y/n**	y	Part 1, Table 7-1		y
Project costs and financing	40	**y/n**	y	Part 1, Table 7-1		y
Address economic feasibility	40	**y/n**	y	Part 1, Table 7-1		y
Project status	40	**y/n**	y	Part 1, Table 7-1		y
Strategic implementation of plan and project merit	40	**y/n**	y	Part 1, Table 7-1		y
Status of the Project Proponent's IRWM plan adoption	40	**y/n**	y	Part 1, Table 7-1		y
Project's contribution to reducing dependence on Delta supply (for IRWM regions receiving water from the Delta).	40	**y/n**	y	Part 1, Table 7-1		y
Project's contribution to climate change adaptation. •Include potential effects of Climate Change on the region and consider if adaptations to the water management system are necessary **(1)**. •Consider the contribution of the project to adapting to identified system vulnerabilities to climate change effects on the region. •Consider changes in the amount, intensity, timing, quality and variability of runoff and recharge. •Consider the effects of SLR on water supply conditions and identify suitable adaptation measures.	40	**y/n**	y	Part 1, Table 7-1		y

Contribution of project in reducing GHGs compared to project alternatives. •Consider the contribution of the project in reducing GHG emissions as compared to project alternatives •Consider a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over the 20-year planning horizon. •Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.	40	**y/n**	y	Part 1, Table 7-1		y
Specific benefits to critical water issues for Native American tribal communities.	53	**y/n**	y	Part 1, Table 7-1		y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10540 (e)(10).

IRWM Plan Standard: Impact and Benefit					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Discuss potential impacts and benefits of plan implementation within IRWM region, between regions, with DAC/EJ concerns and Native American Tribal communities	40	**y/n**	y	Part 1, Section 8.4		y
State when a more detailed project-specific impact and benefit analysis will occur (prior to any implementation activity)	55	**y/n**	y	Part 1, Section 8.5.4		y
Review and update the impacts and benefits section of the plan as part of the normal plan management activities	55 - 56	**y/n**	y	Part 1, Section 8.5		y

IRWM Plan Standard: Plan Performance and Monitoring				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Contain performance measures and monitoring methods to ensure that IRWM objectives are met **(1)**.	40	**y/n**	y	Part 1, Section 8.5.1		y
Contain a methodology that the RWMG will use to oversee and evaluate implementation of projects.	40	**y/n**	y	Part 1, Section 8.5.1		y
Each project in the IRWM Plan is monitored to comply with all applicable rules, laws, and permit requirements.	58	**y/n**	y	Part 1, Section 8.5.1.2		y
Contain policies and procedures that promote adaptive management and, as more effects of Climate Change manifest, new tools are developed, and new information becomes available, adjust IRWM plans accordingly.	40	**y/n**	y	Part 1, Section 8.5		y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10541 (e)(7).

IRWM Plan Standard: Data Management				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Describe data needs within the IRWM region	59 - 60	**y/n**	y	Section 8.5.2 and Section 6.3 (metrics to measure		y
Describe typical data collection techniques	59 - 60	**y/n**	y	Volume 1, Section 8.5.2		y
Describe stakeholder contributions of data to a data management system	59 - 60	**y/n**	y	Volume 1, Section 8.5.2		y
Describe the entity responsible for maintaining data in the data management system	59 - 60	**y/n**	y	Volume 1, Section 8.5.2		y
Describe the QA/QC measures for data	59 - 60	**y/n**	y	Volume 1, Section 8.5.2		y
Explain how data collected will be transferred or shared between members of the RWMG and other interested parties throughout the IRWM region, including local, State, and federal agencies **(1)**.	59 - 60	**y/n**	y	Volume 1, Section 8.5.2		y
Explain how the Data Management System supports the RWMG's efforts to share collected data	59 - 60	**y/n**	y	Volume 1, Section 8.5.2		y
Outline how data saved in the data management system will be distributed and remain compatible with State databases including CEDEN, Water Data Library (WDL), CASGEM, California Environmental Information Catalog (CEIC), and the California Environmental Resources Evaluation System (CERES).	59 - 60	**y/n**	y	Volume 1, Section 8.5.2		y

(1) Requirement must be addressed per CWC §10541 (e)(12).

IRWM Plan Standard: Finance				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Include aprogrammatic level (i.e. general) plan for implementation and financing of identified projects and programs **(1)** including the following:	41	**y/n**	y	Part 1, Section 8.2.2		y
List known, as well as, possible funding sources, programs, and grant opportunities for the development and ongoing funding of the IRWM Plan.	41	**y/n**	y	Part 1, Section 8.2.2		y
List the funding mechanisms, including water enterprise funds, rate structures, and private financing options, for projects that implement the IRWM Plan.	41	**y/n**	y	Part 1, Section 8.2.2		y
An explanation of the certainty and longevity of known or potential funding for the IRWM Plan and projects that implement the Plan.	41	**y/n**	y	Part 1, Section 8.2.2		y
An explanation of how operation and maintenance (O&M) costs for projects that implement the IRWM Plan would be covered and the certainty of operation and maintenance funding.	41	**y/n**	y	Part 1, Section 8.2.2		y

(1) Requirement must be addressed per CWC §10541 (e)(8).

IRWM Plan Standard: Technical Analysis					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Document the data and technical analyses that were used in the development of the plan **(1)**.	41	**y/n**	y	Part 1, Section 1.4.3		y

(1) Requirement must be addressed per CWC §10541 (e)(11).

IRWM Plan Standard: Relation to Local Water Planning					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Identify a list of local water plans used in the IRWM plan	41	**y/n**	y	Part 1, Section 1.4.3		y
Describe the dynamics between the IRWM plan and other planning documents	41	**y/n**	y	Part 1, Section 1.4.3 and 1.6.2		y
Describe how the RWMG will coordinate its water mgmt planning activities	41	**y/n**	y	Part 1, Section 8.1		y
Discuss how the plan relates to these other planning documents and programs. Same as 2012 GL with the following addition: "It should be noted that Water Code § 10562 (b)(7) requires the development of a stormwater resource plan and compliance with these provisions to receive grants for stormwater and dry weather runoff capture projects. Upon development of the stormwater resource plan, the RWMG shall incorporate it into IRWM plan. The IRWM Plan should discuss the processes that it will use to incorporate such plans." Minor wording differences - e.g. Groundwater Sustainability Plan example in the 2016 Guidelines instead of Groundwater Management Plan in the 2012 Guidelines.	63 - 64	**y/n**	n	Part 1, Table 1-3 and Section 6.4.2		y
Consider and incorporate water management issues and climate change adaptation and mitigation strategies from local plans into the IRWM Plan.	63 - 64	**y/n**	y	Part 1, Sections 6.2.1.8, 6.3.6 and 6.4.2		y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

IRWM Plan Standard: Relation to Local Land Use Planning					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Document current relationship between local land use planning, regional water issues, and water management objectives	41	**y/n**	y	Part 1, Section 1.6.2 and Part 2		y
Document future plans to further a collaborative, proactive relationship between land use planners and water managers	41	**y/n**	y	Part 1, Section 8.1		y
Demonstrate information sharing and collaboration with regional land use planning in order to manage multiple water demands throughout the state, adapt water management systems to climate change, and potentially offset climate change impacts to water supply in California.	41	**y/n**	y	Part 1, Sections 1.6.2 and 8.1, and Part 2		y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

IRWM Plan Standard: Stakeholder Involvement				Overall Standard Sufficient		Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Discuss involvement of DACs and tribal communities in the IRWM planning effort	41 - 42	**y/n**	y	Part 1, Sections 1.3.3, 1.3.4, 1.4.1 and 1.4.2		y
Describe decision-making process and roles that stakeholders can occupy	41 - 42	**y/n**	y	Part 1, Sections 1.3.3 and 1.3.4		y
Discuss how stakeholders are necessary to address objectives and RMS	41 - 42	**y/n**	y	Part 1, Sections 1.3.3		y
Discuss how a collaborative process will engage a balance in interest groups	41 - 42	**y/n**	y	Part 1, Sections 1.1 and 1.3		y
Contain a public process that provides outreach and opportunity to participate in the IRWM plan **(1)**. Per 2016 GL: "Native American tribes – It should be noted that tribes are sovereign nations, and as such coordination with tribes is on a government-to-government basis."	41 - 42	**y/n**	y	Part 1, Sections 1.3.3, 1.3.4, 1.4.1 and 1.4.2		y
Identify process to involve and facilitate stakeholders during development and implementation of IRWM plan regardless of ability to pay; include description of any barriers to involvement **(2)**. "Stakeholder Involvement" in the 2012 GL is referred to "Native American Tribe and Stakeholder Involvement" in the 2016 GL and Tribes are referred to specifically.	41 - 42	**y/n**	y	Part 1, Sections 1.3.3, 1.3.4, 1.4.1, 1.4.2 and 8.1		y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 IRWM Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10541 (g).

(2) Requirement must be addressed per CWC §10541 (h)(2).

IRWM Plan Standard: Coordination					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y
Identify the process to coordinate water management projects and activities of participating local agencies and stakeholders to avoid conflicts and take advantage of efficiencies **(1)**.	42	**y/n**	y	Part 1, Sections 1.3.3 and 8.1		y
Identify neighboring IRWM efforts and ways to cooperate or coordinate, and a discussion of any ongoing water management conflicts with adjacent IRWM efforts	42	**y/n**	y	Part 1, Section 1.6.1		y
Identify areas where a state agency or other agencies may be able to assist in communication or cooperation, or implementation of IRWM Plan components, processes, and projects, or where State or federal regulatory decisions are required before implementing the projects.	42	**y/n**	y	Part 1, Section 1.3		y

(1) Requirement must be addressed per CWC §10541 (e)(13).

IRWM Plan Standard: Climate Change					Overall Standard Sufficient	Yes
Requirement		Included		Evidence of Plan Sufficiency		Sufficient
IRWM 2016 Guidelines Requirement	IRWM 2016 Guidelines Page Number	y/n - Present/Not Present in the IRWM Plan. If y/n/q, qualitative evaluation needed.		Location of Standard in Grantee IRWM Plan	Brief Qualitative Evaluation	y/n
Contain a plan, program, or methodology for further data gathering and analysis of prioritized vulnerabilities.	42 - 44	**y/n**	y	Part 1, Section 8.5		y
Include climate change as part of the project review process.	42 - 44	**y/n**	y	Part 1, Table 7-1		y
Evaluate IRWM region's vulnerabilities to climate change and potential adaptation responses based on vulnerabilities assessment in the DWR Climate Change Handbook for Regional Water Planning **(1)**. Addition in 2016 GL - "At a minimum, the vulnerability evaluation must be equivalent to the vulnerability assessment contained in the Climate Change Handbook for Regional Water Planning, Section 4 and Appendix B."	42 - 44	**y/n**	y	Part 1, Section 6.2.1.8		y
Provide a process that considers GHG emissions when choosing between project alternatives **(1)**. Addition in 2016 GL - "At a minimum, that process must determine a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over a 20-year planning horizon and consider energy efficiency and reduction of GHG emissions when choosing between project alternatives."	42 - 44	**y/n**	y	Part 1, Table 7-1	The Region's project review process incorporates GHG reduction under its "Sustainability" criteria shown in Table 5-1 through the question: "Does the project mitigate against or help adapt to climate change?" Projects that contribute towards climate change mitigation are expected to reduce GHGs, and are awarded higher scores. The information used to make this determination is gathered using the project nomination form that allows project sponsors to quantify the estimated decrease in GHG emissions a project will provide.	y
Include a list of prioritized vulnerabilities based on the vulnerability assessment and the IRWM's decision making process. Addition in 2016 GL - "A list of prioritized vulnerabilities which includes a determination regarding the feasibility for the RWMG to address the priority vulnerabilities."	42 - 44	**y/n**	y	Part 1, Section 6.2.1.8	The region identified primary concerns stemming from the Vulnerability Assessment Checklist located in Appendix XX of Part 3.	y

Address adapting to changes in the amount, intensity, timing, quality, and variability of runoff and recharge.	42 - 44	**y/n**	y	Part 1, Sections 2.6.2 and 2.6.3, Table 7-1, and Section 6.3.6	The Region identified the set of vulnerabilities found in Part 3 based on climate change impacts to amount, intensity, timing, quality and variability of runoff and recharge. To respond to the effects of climate change and identified vulnerabilities, the Region identified the Objective to "Adapt to and mitigate against climate change by promoting adaptation strategies adn reducing wtaer related GHG emissions". Additionally, all of the objectives included in the IRWM Plan either directly or indirectly will help to respond to climate change. Finally, the Region has also included climate change as part of its project review process.	y
Areas of the State that receive water imported from the Sacramento-San Joaquin River Delta, the area within the Delta, and areas served by coastal aquifers must also consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.	42 - 44	**y/n**	y	Part 1, Section 2.6.3 and Table 6-3	The Region currently receives imported water from the Delta, and therefore identified decreased imported water supply as a vulnerability issue. To help adapt to this vulnerability, the Region identified objectives to reduce regional potable water consumption and increase local supply development. In addition, the Region also set the objective to adapt to and mitigate against climate change by proimoting adaptation strategies and reducing water and wastewater related GHG emissions.	y

IRWM Plan Standard Requirements for 2016 IRWM Guidelines in Addition to Previously Required 2012 Guideline Requirements. See Appendix H in IRWM 2016 Guidelines.

(1) Requirement must be addressed per CWC §10541 (e)(9).

D: San Bernardino County USARW Stormwater Resource Plan

SAN BERNARDINO COUNTY
PUBLIC WORKS

SAN BERNARDINO COUNTY
SANTA ANA RIVER WATERSHED
STORMWATER RESOURCE PLAN

1561 E. Orangethorpe Avenue, Suite 240
Fullerton, California 92831
(714) 526-7500
www.cwecorp.com

San Bernardino County
Santa Ana River Watershed
Stormwater Resource Plan

FINAL

Prepared for:

San Bernardino County Flood Control District
825 East Third Street
San Bernardino, California 92415
(909) 387-8119

Prepared by:

1561 E. Orangethorpe Avenue, Suite 240
Fullerton, California, 92831

TEL (714) 526-7500 | FAX (714) 526-7004 | www.cwecorp.com

November 2018

Table of Contents

Attachments

List of Figures

List of Tables

Acronyms

AES	Advanced Engineering Software
AF	Acre-Feet
AFY	Acre-Feet per Year
AGR	Agricultural Supply
ASBI	Area of Special Biological Importance
ASBS	Areas of Special Biological Significance
BBL	Big Bear Lake
BBLN	Big Bear Lake Nutrient and Nuisance Aquatic Plants
BBMWD	Big Bear Municipal Water District
BMP	Best Management Practice
BPA	Basin Plan Amendment
BVMWC	Bear Valley Mutual Water Company
CASQA	California Stormwater Quality Association
CBRP	Comprehensive Bacteria Reduction Plan
CBWCD	Chino Basin Water Conservation District
CBWM	Chino Basin Watermaster
CDFW	California Department of Fish and Wildlife
CDS	Continuous Deflection Separator
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
COLD	Cold Freshwater Habitat
CRAM	California Rapid Assessment Methods
CTR	California Toxics Rule
CWA	Clean Water Act
DAC	Disadvantaged Community
DDT	Dichlorodiphenyltrichloroethane
EIR	Environmental Impact Report
ESA	Endangered Species Act
EVWD	East Valley Water District
FCS	Full Capture Systems
GAC	Granular Activated Carbon
GIS	Geographic Information System
GWR	Groundwater Recharge
HEC-HMS	Hydrologic Engineering Center – Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Center – River Analysis System
HSPF	Hydrological Simulation Program – Fortran
IEUA	Inland Empire Utilities Agency
IGP	Industrial General Permit
IRWM	Integrated Regional Water Management

IRWMP	Integrated Regional Water Management Plan
IS	Initial Study
ISWEBE	Inland Surface Waters, Enclosed Bays, and Estuaries
LA	Load Allocation
MCL	Maximum Contaminant Level
MND	Mitigated Negative Declaration
MS4	Municipal Separate Storm Sewer System
MSAR	Middle Santa Ana River
MUN	Municipal and Domestic Water Supply
MWD	Metropolitan Water District of Southern California
MZ	Management Zones
ND	Negative Declaration
NGO	Non-Governmental Organization
NL	Notification Level
NPDES	National Pollutant Discharge Elimination System
OAL	Office of Administrative Law
OCWD	Orange County Water District
OWOW	One Water, One Watershed
OWTS	Onsite Wastewater Treatment Systems
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethylene
POTW	Publicly-Owned Treatment Works
POW	Hydropower Generation
QAPP	Quality Assurance Program Plan
RARE	Rare, Threatened, or Endangered Species
RCP	Reinforced Concrete Pipe
REC1	Water Contact Recreation
REC2	Water Non-contact Recreation
RHWC	Riverside Highland Water Company
ROWD	Report of Waste Discharge
SANBAG	San Bernardino Associated Governments
SARW	Santa Ana River Watershed
SARWQCB	Santa Ana Regional Water Quality Control Board
SAWPA	Santa Ana Watershed Project Authority
SB	Senate Bill
SBC	San Bernardino County
SBCDPW	San Bernardino County Department of Public Works
SBCFCD	San Bernardino County Flood Control District
SBMWD	San Bernardino Municipal Water District
SBPAT	Structural Best Management Practice Prioritization and Analysis Tool
SBVMWD	San Bernardino Valley Municipal Water District
SBVWCD	San Bernardino Valley Water Conservation District
SCS	Soil Conservation Service
SDWA	Safe Drinking Water Act

SPOEEP	Stakeholder and Public Outreach, Education, and Engagement Plan
SPWN	Spawning, Reproduction, and Development
SUSTAIN	System for Urban Stormwater Treatment and Analysis Integration
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Stormwater Management Model
SWRCB	State Water Resources Control Board
SWRP	Stormwater Resource Plan
TAC	Technical Advisory Committee
TCE	Trichloroethylene
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UA	Unincorporated Areas
UAA	Use Attainability Analyses
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
VOCs	Volatile Organic Compounds
WARM	Warm Freshwater Habitat
WEI	Wildermuth Environmental, Inc.
WILD	Wildlife Habitat
WLA	Waste Load Allocation
WLAM	Wasteload Allocation Model
WMS	Watershed Modeling System
WMWD	Western Municipal Water District
WQO	Water Quality Objective
WSPG	Water Surface Pressure Gradient
WWTP	Wastewater Treatment Plant
WVWD	West Valley Water District
YVWD	Yucaipa Valley Water District

Executive Summary

This Stormwater Resource Plan (SWRP) was prepared to develop a regional, watershed-based plan for management and improvement of stormwater resources within the Santa Ana River Watershed (SARW) portion of San Bernardino County (SBC). This SWRP is a document that complies with the requirements and guidelines set forth by the State Water Resources Control Board (SWRCB) mandated by Senate Bill 985 (SB 985), passed by the California State Legislature and signed into law by Governor Jerry Brown on September 25, 2014.

The intent of the SWRP is to develop a regional plan of stormwater resources to maximize benefits within the SBC portion of the SARW, an area of 1,015 square miles and home to nearly 2 million people, or about 80% of the overall population of the county. The SBC SARW contains the headwaters of the Santa Ana River and the headwaters of many of its tributaries draining from the San Bernardino and San Gabriel Mountains. The SWRP establishes stormwater and dry-weather runoff goals and objectives for the entire SBC SARW to provide water quality, water supply, flood management, environmental, and community benefits. The intention of this SWRP is not to preclude a stakeholder from fulfilling their agency's primary mission, but to identify and prioritize multi-benefit projects when feasible.

The SBC SARW SWRP includes a section on the water quality objectives within the watershed. Meeting existing water quality objectives is an important component of the SWRP. Existing planning efforts have been identified, as the intent of the SWRP is not to replace existing efforts, but rather to work in conjunction with existing goals already defined in regulations and planning efforts. Stakeholders were identified, along with a process for collaborating with organizations, stakeholders, and the public.

The SWRP contains a number of potential stormwater and dry-weather runoff projects. The types of projects include low-flow capture, infiltration basins, channel improvements, bioretention projects, habitat remediation, public use areas, and green streets projects. Each project included provides multiple benefits to the community and contributes towards the achievement of stormwater goals and objectives. The multiple benefits are quantified and projects are prioritized based on an integrated metrics-based analysis. An implementation strategy and a rough estimation of a schedule for each project is included in the plan.

The SWRP was prepared with community and stakeholder involvement at each step of the process. The outreach, collaboration, and educational components are summarized within the SWRP. The SWRP is a living document which can be used for many years and will be adaptively managed based on the changing needs and resource goals within the SBC SARW. The SWRP will be submitted to the Santa Ana Watershed Protection Authority (SAWPA) for inclusion in their One Water, One Watershed (OWOW) Plan.

1. Introduction

California voters passed the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) during the general election of November 4, 2014. As a precursor to the passage of Proposition 1, the California State Legislature adopted Senate Bill (SB) 985 entitled the Stormwater Resource Planning Act (SB 985), requiring the development of a Stormwater Resource Plan (SWRP) to be eligible to receive grants from a bond act approved after January 1, 2014, for stormwater and dry-weather runoff capture projects. A SWRP is a stormwater management document developed on a watershed basis that identifies a prioritized list of projects to address stormwater and dry-weather runoff, while also providing multiple benefits, such as water supply, flood management, and environmental and community enhancements. The State Water Resources Control Board (SWRCB) developed Stormwater Resource Plan Guidelines (2015) to facilitate the preparation of SWRPs or equivalent documents. Proposition 1 includes numerous project categories to be funded, one being the Stormwater Grant Program. Planning and implementation grants were included in the Stormwater Grant Program. Planning grants were used for developing SWRPs and/or conducting studies prior to project implementation while the implementation grants were used to fund projects identified in a SWRP or equivalent document.

The San Bernardino County Flood Control District (SBCFCD) was awarded Proposition 1 planning grant funds through the Stormwater Grant Program for the development of the San Bernardino County Santa Ana River Watershed (SBC SARW) SWRP (Grant Agreement No. D1612627). The SBC SARW area encompasses the upper limits of the SARW that lies within the San Bernardino County jurisdictional boundary and is comprised of 14 subwatersheds associated with major tributaries to the Santa Ana River. The SBC SARW SWRP has been developed with funding provided by this planning grant program based on the conditions of the grant agreement.

The following subsections provide background information on the history of stormwater management legislation in California, the intended use of this SWRP, and the existing regulations and planning efforts that this SWRP will complement. **Section 1.5** introduces the stormwater management objectives addressed by the SBC SARW SWRP, and **Section 1.6** outlines the structure of this document.

1.1 Background

Stormwater and dry-weather runoff are resources that must be managed on a regional scale to maximize benefits. The California State Legislature found that "improved management of stormwater and dry-weather runoff, including capture, treatment, and reuse by using the natural functions of soils and plants, can improve water quality, reduce localized flooding, and increase water supplies for beneficial uses and the environment." That finding was included with the passage of SB 985 in 2014, the Stormwater Management Planning Act.

Historically, stormwater management focused on the conveyance of stormwater offsite as quickly as possible. The conveyance of stormwater has been generally regarded as separate from the concept of water supply infrastructure and water quality management. Conveyance of stormwater through Municipal Separate Storm Sewer Systems (MS4s) and flood control infrastructure was combined with water quality regulations in California with the passage of the Porter-Cologne Water Quality Control Act of 1969, followed soon thereafter nationally by the Clean Water Act (CWA) of 1972. The CWA prohibited any entity from discharging pollutants through a point source into a water of the United States unless

that entity had a National Pollutant Discharge Elimination System (NPDES) permit. Through these regulations, water quality became a priority for municipalities on par with flood control management.

The traditional approach to stormwater management as a flood control and water quality issue did not address projects that could attain multiple benefits, such as the augmentation of the water supply or protection of the local ecology. In general, the conveyance of stormwater through storm drains and channels reduced the ability of the environment to capture runoff and treat it through natural hydrology and watershed processes. Municipalities sacrificed opportunities to use stormwater runoff to augment water supply by favoring the quick conveyance of stormwater runoff downstream rather than capturing the runoff and storing it. As a result, municipalities are forced to import costly water from the California State Water Project and deplete local groundwater basins to meet water demands.

The California State Legislature passed the Integrated Regional Water Management (IRWM) Planning Act of 2002, which encouraged the establishment of regional water management groups, which would then prepare a regional plan to address the quantity, quality, and reliability of water supplies. The Act established the idea of creating a regional planning document, an Integrated Regional Water Management Plan (IRWMP), as a framework for integrating various programs and projects with the primary goal of enhancing water supplies, but with a secondary goal of providing flood protection, improving water quality, and undertaking environmental restoration or enhancement. Since the Act passed in 2002, various bond acts approved by California voters have provided over $1.5 billion in funding to support multi-benefit regional projects (DWR, 2018).

By 2009, the State of California had established funding for projects to encourage water supply through the IRWM groups, and requirements for projects to enhance water quality. The existing programs did not encourage the implementation of multi-benefit stormwater projects. In response, the California State Legislature passed SB 790, the Stormwater Resource Planning Act, authored by Senator Fran Pavley, which introduced the concept of a SWRP. SB 790 authorized a city, county, or special district to develop, jointly or individually, a SWRP. The purpose of a SWRP was to identify, on a watershed basis, projects and programs that could augment local water supplies, control pollution, enhance habitat, and provide other multiple community benefits. The Stormwater Resource Planning Act "change[d] perspective on stormwater from being a water quality problem to recognizing that stormwater could be a source of water supply for a variety of purposes," according to Pavley (2009).

In 2014, the Stormwater Resource Planning Act was amended by SB 985, also authored by Pavley, which expanded the standards to include dry-weather runoff and made the development of a SWRP a prerequisite for receiving money from any bond act approved by California voters after January 1, 2014. One such bond act, known as the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1), was approved by voters in November of 2014. Proposition 1 authorized $7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects (including surface and groundwater storage), and drinking water protection.

SB 985 required the State of California to establish guidelines for the development of SWRPs. The SWRCB published the SWRP Guidelines in December of 2015 to establish guidance for public agencies interested in developing SWRPs. The SWRP Guidelines "serve as a guide for the State Water Board and other bond fund-dispensing agencies to use in determining whether an adequate Stormwater Resource Plan has been prepared prior to the granting of funds for stormwater and dry-weather runoff capture projects." This SWRP has been developed in consideration of the SWRP Guidelines.

1.2 Intended Use of the SWRP

The purpose of the SBC SARW SWRP is to create a plan that characterizes the SBC SARW, provides a template for interagency coordination and outreach, quantifies potential solutions to achieve stormwater management goals and objectives, and outlines a strategy for implementation. The intent is not to create a plan that replaces objectives that already exist within the SBC SARW but rather to work in conjunction with existing goals already defined in regulations and planning efforts.

1.3 Consistency with Applicable Regulations

Effective stormwater planning and management on a watershed level basis requires agreement of applicable water quality provisions developed and implemented by the United States Environmental Protection Agency (USEPA), SWRCB, Santa Ana Regional Water Quality Control Board (SARWQCB), and local agencies and stakeholders. Projects identified within this SWRP are consistent with applicable requirements of the provisions outlined in subsequent sections.

1.3.1 California Environmental Quality Act

Stormwater related projects proposed for the study area by public agencies must comply with the California Environmental Quality Act (CEQA) statute, California Public Resources Code § 21000 et seq., purposed to disclose to the public the significant environmental effects of proposed discretionary projects, through the preparation of an Initial Study (IS) and Negative Declaration (ND), Mitigated Negative Declaration (MND), or Environmental Impact Report (EIR). CEQA requires that any impacts determined to be significant must be mitigated to a level of non-significance.

Each project and/or program identified in this SWRP will be reviewed and documentation will be prepared in accordance with CEQA requirements prior to implementation of the project/program. The agency responsible for implementation will also be responsible for the CEQA requirements.

1.3.2 Clean Water Act

The CWA established the structure for regulating point source discharges of pollutants into the waters of the United States and water quality standards for surface waters. Under the CWA, USEPA has implemented pollution control programs and set water quality standards for contaminants in surface waters. One program that ties water quality standards and surface waters is the 303(d) listing of impaired waters. The list serves as a tracking system for water bodies and associated pollutants causing impairments. Waste discharge requirements regulate discharge water quality through the assignment of Total Maximum Daily Loads (TMDLs), based on the severity of the pollution and sensitivity of the beneficial uses to be protected. Water bodies currently on the 303(d) list within the SBC SARW are identified in **Section 3.1**.

The Porter-Cologne Water Quality Control Act, also known as the California Water Code, Section 7, was established to protect water quality as well as its beneficial uses and consists of three elements: beneficial uses, water quality objectives, and an implementation program. The Regional Water Quality Control Boards implement the applicable Basin Plan(s) by issuing and enforcing waste discharge requirements to individuals, municipalities, and/or businesses whose point source or non-point source waste discharges can impact water quality.

1.3.2.1 NPDES MS4 Permit Order No R8-2010-0036

The NPDES Permit and Waste Discharge Requirements for the SBCFCD, the County of San Bernardino, and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Order No. R8-2010-0036 (MS4 Permit) was adopted on January 29, 2010, and expired on January 29, 2015. The MS4 Permit was administratively extended until a new permit is issued. The MS4 Permit regulates the discharge of pollutants from anthropogenic sources from MS4s. Among many things, the MS4 Permit outlines the responsibilities of the Permittees, defines discharge prohibitions and receiving water limitations, and identifies programs that must be implemented in an effort to minimize pollutant discharges. The MS4 Permit requires that Permittees establish legal authority for inspections, enforcement, prohibition of waste discharge, and other actions necessary to uphold the MS4 Permit requirements. Although the expiration date has passed, the MS4 Permit must be abided by until a new MS4 Permit is adopted by the SARWQCB. The MS4 Permit applies to the SBC SARW area and the SWRP was developed to be consistent with the requirements contained within it.

1.3.2.2 Report of Waste Discharge: Application for Renewal of the Municipal NPDES Stormwater Permit (NPDES Permit No. CAS618036)

The Report of Waste Discharge (ROWD) was prepared as part of the MS4 Permit renewal application process, which will result in the development and adoption of a fifth-term MS4 Permit by the SARWQCB. The ROWD was submitted August 1, 2014, to the SARWQCB. The ROWD identifies the accomplishments of the San Bernardino County Areawide Stormwater Program (Areawide Program), which implements the shared requirements set forth by the MS4 Permit, and develops priorities for the watershed area. The ROWD presents iterative Best Management Practice (BMP) approaches that continue to be successful. The data and findings included within the ROWD were referenced throughout the SWRP development and are used to support approaches taken to address the SWRP Guidelines (2015).

1.3.2.3 Clean Water Act, Section 401

Section 401 of the CWA requires that any person applying for a federal permit or license, which may result in the discharge of pollutants into waters of the United States, must obtain a state water quality certification that the activity complies with all water quality standards, limitations, and restrictions. Certification or a waiver under Section 401 is required prior to other federal agency certifications or licenses. This certification is required prior to construction and is only applicable during construction activities. The authority to certify projects has been delegated to local Regional Water Quality Control Boards, which in this case is the SARWQCB. Several projects included in this SWRP are located within open conveyances and will need to comply with Section 401 requirements. The projects will be designed to preserve beneficial uses, satisfy water quality objectives, and be consistent with the Antidegradation Policy according to CWA 40 Code of Federal Regulations (CFR) 131. The agency responsible for a project's implementation is also responsible for compliance with Section 401.

1.3.2.4 Clean Water Act, Section 404

Section 404 of the CWA establishes a program that requires a permit to be obtained prior to construction to regulate the discharge of dredged or fill material into the waters of the United States. The basic premise of the program is that no discharge of dredged or fill material may be permitted if a practicable alternative exists that is less damaging to the aquatic environment or the nation's waters would be significantly degraded. When applying for a permit, it must be clear that steps have been taken to

minimize potential impacts and that compensation will be provided for all remaining unavoidable impacts. Individual permits are reviewed by the United States Army Corps of Engineers (USACE) and applications are evaluated under public interest review as well as Section 404 guidelines. For most discharges that will have only minimal adverse effects, a general permit may be suitable. General permits are issued on a nationwide, regional, or state basis for particular categories of activities. Several projects included in this SWRP are located within open conveyances and will need to comply with Section 404 requirements. The agency responsible for a project's implementation is also responsible for compliance with Section 404.

1.3.3 Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) gives the USEPA authority to set drinking water standards. Projects that have been identified in the SBC SARW SWRP have no components foreseen to be applicable to the SDWA.

1.3.4 Water Rights Permits

An entity must have a water right to capture or divert stream flows from natural streams, including flows incurred during peak storm events, to artificially recharge groundwater aquifers. Except where the storage and beneficial use are authorized under an existing appropriative right or a change in an existing right, this will require filing an application with the SWRCB to obtain a water right permit. Exceptions to acquiring water rights exist for flood control projects, those designed and used solely for flood protection and not for beneficial use. Exceptions also exist for pre-1914 rights, projects diverting water under a valid pre-1914 appropriative right.

The type of application required for a given project is dependent upon the duration of operation and urgency of water needs. The two types are outlined below:

- Temporary Permits – expire within 180 days of issuance and are typically appropriate for short-term or infrequent diversions where an urgent need may exist.
- Standard Permits – appropriate for long-term projects and may take several years to issue.

1.3.5 Areas of Special Biological Significance

Areas of Special Biological Significance (ASBS) are important areas outlined in the California Ocean Plan for which additional water quality protection may be necessary. State regulations mandate that "waste shall not be discharged to designated Areas of Special Biological Significance…" Currently, there are no ASBSs applicable to the projects identified in this SWRP.

1.3.6 Total Maximum Daily Loads

TMDLs are developed for water bodies on the CWA 303(d) List and define how much of a pollutant can be present in a water body and still meet water quality standards and protect beneficial uses. There are two TMDLs in the SBC SARW: Big Bear Lake Nutrients and Nuisance Aquatic Plants TMDL and the Middle Santa Ana River Bacterial Indicator TMDL. Additional details pertaining to these TMDLs are provided in **Section 3**.

1.3.7 Other Federal and/or State Laws, Regulations, and Permits

In addition to federal and state laws, regulations, and permits described above, compliance will be demonstrated for the following programs as listed below.

1.3.7.1 United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) governs the Endangered Species Act (ESA), which directs all Federal agencies to conserve endangered and threatened species and use their authorities to further the purpose of the Act. Section 7 of the Act, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. Based on preliminary review, endangered and/or threatened species exist in the SBC SARW and projects may need to comply with these requirements on a project by project basis. The agency responsible for project implementation is responsible for complying with these requirements, as applicable.

Under Section 7, Federal agencies must consult with the USFWS when they carry out any action, funds, or authorizations (such as through a permit) which may affect a listed endangered or threatened species. This process usually begins as an informal consultation, as the Federal agency approaches the USFWS in the early stages of a project to discuss the types of listed species that may be in the project area and what effect the project may have on those species. If the Federal agency and the USFWS determine that the proposed project is not likely to affect any listed species in the project area, the informal consultation is complete and the proposed project can move forward. If it appears that the project may affect a listed species, the Federal agency will coordinate with the applicant to prepare a biological assessment to assist in the determination of the project's effect on the species.

1.3.7.2 California Department of Fish and Wildlife Code Section 1602

The Fish and Game Code Section 1602 requires an entity to notify the California Department of Fish and Wildlife (CDFW) prior to the commencement of any activity that may do one or more of the following:

1. Substantially divert or obstruct the natural flow of any river, stream, or lake;
2. Substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
3. Deposit or dispose of debris, waste, or other materials containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

The Notification of Lake or Streambed Alteration form must be completed and submitted along with the applicable fee to the Central Region (Region 4) to notify the CDFW regarding the project once it is scheduled to be implemented. Applicable special status studies, biological assessments, and hydrological studies must be included in the submittal package. When there is a potential for endangered and/or threatened species to exist in the project vicinity, then these requirements must be complied with. Special status studies and biological assessments will be required for these species plus any other endangered and/or threatened species known in the area. The agency responsible for implementation of a given project must also evaluate the applicability of these requirements and conform as necessary.

1.3.7.3 Mosquito Abatement and Vector Control District Law

The Mosquito Abatement Act of 1915 allows municipalities and counties to create Mosquito Abatement Districts. Projects identified in the SBC SARW SWRP will comply with requirements of the local mosquito abatement district. The San Bernardino County Department of Public Health, Division of Environmental Health Services, Mosquito and Vector Control Program provide mosquito abatement services within the San Bernardino County Region. Vector control is applicable to projects that have the potential for standing water. The agency responsible for a project's implementation is also responsible for coordination pertaining to vector control.

1.4 Existing Planning Efforts

Various local plans currently exist and are in effect within the SBC SARW related to water management. The intent of the SBC SARW SWRP is not to supersede these plans, but to improve water management objectives in the SBC SARW in conjunction with already existing efforts. Current planning efforts in the region that were considered throughout the development of this SWRP are described in detail in the Annotated List of Data and Reports Technical Memorandum (**Attachment A**) and **Section 4.2**. One major existing planning effort that is referenced throughout the SWRP is the Santa Ana Watershed Project Authority's (SAWPA's) One Water, One Watershed (OWOW) 2.0 Plan (2014). The OWOW Plan is the IRWMP for the SARW.

1.5 Stormwater Management Objectives

Stormwater management objectives have been identified for the SBC SARW to guide project/program identification, prioritization, and implementation within the watershed. The SWRP Guidelines (2015) state that plans must "discuss how the various stormwater management objectives within the watershed will protect or improve water quality, water supply reliability, and/or achieve other objectives."

1.5.1 Objectives Specific to the SBC SARW SWRP

The stormwater management objectives for the SBC SARW SWRP are spread across five categories of stormwater management goals. These goals are as follows, while **Table 1-1** summarizes the specific stormwater objectives:

1. Enhance water quality
2. Maximize water supply
3. Improve flood management
4. Protect the environment
5. Provide community benefits

Table 1-1 Stormwater Management Objectives

Goal	Objective	Description of Objective
Enhance Water Quality	Pollutant Load Reduction	Reduce the pollutant load from the contributing drainage area to achieve water quality objectives in downstream receiving waters, focusing on the water quality priorities identified in **Section 3.4**.
	Stormwater Runoff Reduction	Reduce volume of stormwater runoff from the project tributary area to downstream receiving waters to improve water quality by reducing the discharge of polluted runoff.
Maximize Water Supply	Stormwater Recharge	Increase the amount of stormwater runoff captured and infiltrated into groundwater basins.
	Recycled Water Recharge	Increase the amount of recycled water captured and infiltrated into groundwater basins.
Improve Flood Management	Runoff Rate Reduction	Reduce the peak runoff rate for the 100-year storm event, such that flooding is reduced.
	Runoff Volume Reduction	Reduce the volume of floodwaters reaching downstream conveyances, such that additional capacity is available downstream and flooding is reduced.
	Flood Elevation Reduction	Reduce flood elevation (water surface elevation) of the 100-year flood in conveyances downstream, which reduces the risk to property damage or loss caused by flooding.
	Removal of Parcels/ Structures from the Floodplain	Remove parcels/structures from the 100-year floodplain, decreasing the risk of losing property or human life due to flooding.
	Property Value Saved	Decrease property losses due to flooding.
Protect the Environment	Wetlands Enhancement/ Creation	Enhance/create wetlands to protect and improve habitat for species dependent on aquatic habitats for survival. Wetlands enhancement/creation replaces wetland habitat lost due to the process of urbanization.
	Riparian Area Enhancement	Riparian area enhancement helps protect and improve riparian habitat, which is important to protecting biodiversity, maintaining/improving water quality, and protecting channel slopes, among other benefits.
	Streambed Restoration	Restore or enhance natural streambeds for the protection of fish and wildlife habitat. Streambed restoration can also stimulate the natural scour and sedimentation processes essential to creating coarse sandy loam habitat for the endangered San Bernardino kangaroo rat.
	Increased Urban Green Space	Increase urban green space by providing trees, shrubs, and grasses that can filter pollution from air, water, and soils. Urban green space also provides community benefits of increased access to spaces for recreation, exercise, communing with nature, neighborhood cohesion, and intangible social benefits associated with lower crime rates and improved property values.

Goal	Objective	Description of Objective
Provide Community Benefits	Provide Employment Opportunities	Increase the number of jobs for members of the community.
	Increase Public Education	Increase public education associated with stormwater quality and multi-benefit project implementation, such that the public's understanding of water quality protection results in water quality improvements.
	Increase Community Involvement	Enhance public participation in the design phase of a project. Project buy-in can occur when designers have taken the time to involve the community, which yields long-term community cohesion benefits.
	Recreational Path Enhancement/ Creation	Enhance/create walking paths, sidewalks, and bike trails, which provide community benefits by increasing connectivity, supporting multi-modal transportation, and encouraging a healthy community.
	Public Use Area Enhancement/ Creation	Provide space for communities to gather and recreate, especially within disadvantaged communities, which have been neglected historically in terms of the development of public spaces. Enhancing/creating certain types of public use areas may result in health and social benefits.

The stormwater management objectives will be met through the implementation of the projects and programs described in this SWRP. An evaluation of these stormwater management objectives is included in **Section 6.4**.

1.5.2 Compatibility with IRWMP Goals

The SBC SARW SWRP will be submitted to SAWPA for incorporation into the local IRWMP (OWOW Plan) and the objectives included in this SWRP are consistent with those identified in the OWOW Plan, as shown below. **Table 1-2** lists the goals enumerated in the OWOW 2.0 Plan and the SBC SARW SWRP watershed management objectives that address these goals. Each stormwater management objective specific to the SBC SARW SWRP furthers at least one goal from the OWOW 2.0 Plan.

Table 1-2 Compatibility with IRWMP Goals

OWOW 2.0 Plan Goals	SBC SARW SWRP Objectives
Maintain reliable and resilient water supplies and reduce dependency on imported water	➢ Stormwater Recharge ➢ Recycled Water Recharge
Manage at the watershed scale for preservation and enhancement of the natural hydrology to benefit human and natural communities	➢ Wetlands Enhancement/Creation ➢ Riparian Area Enhancement ➢ Streambed Restoration
Preserve and enhance the ecosystem services provided by open space and habitat within the watershed	➢ Wetlands Enhancement/Creation ➢ Riparian Area Enhancement ➢ Streambed Restoration ➢ Increased Urban Green Space

OWOW 2.0 Plan Goals	SBC SARW SWRP Objectives
Protect beneficial uses to ensure high quality water for human and natural communities	➢ Pollutant Load Reduction ➢ Stormwater Runoff Reduction
Accomplish effective, equitable, and collaborative integrated watershed management	➢ Pollutant Load Reduction ➢ Stormwater Runoff Reduction ➢ Stormwater Recharge ➢ Recycled Water Recharge ➢ Runoff Rate Reduction ➢ Runoff Volume Reduction ➢ Flood Elevation Reduction ➢ Removal of Parcels/Structures from the Floodplain ➢ Property Value Saved ➢ Provide Employment Opportunities ➢ Increase Public Education ➢ Increase Community Involvement ➢ Recreational Paths Enhancement/Creation ➢ Public Use Area Enhancement/Creation

1.6 Elements of the SWRP

The SWRP consists of the following sections:

- **Section 2 – Watershed Identification**

  Internal boundaries within the SBC SARW area are defined and include the following boundaries: watershed and subwatersheds, planning areas, public agency, water utility, and surface and groundwater resources. This section includes the characterization of land use and natural/open space. Identification of the watershed and its characteristics sets the stage for project partners and stakeholder identification, water quality derivations, and potential regional projects.

- **Section 3 – Water Quality**

  Data from existing monitoring programs was compiled from various sources. Existing TMDLs and CWA 303(d) listed impairments are identified for receiving waters within the SBC SARW along with applicable Water Quality Objectives (WQOs). Data was analyzed to determine the exceedance frequency for each of the receiving waters to identify water quality priorities. The identified water quality priorities help guide the implementation efforts for the quantification of project benefits. Water quality data was also used to establish baseline water quality conditions in the SARW area.

- **Section 4 – Organizations, Coordination, and Collaboration**

  Stakeholders, the public, regulators, and Non-Governmental Organizations (NGOs) were solicited for input throughout the development of the SWRP. This section describes the coordination and collaboration that occurred and how it impacted the final SWRP.

- **Section 5 – Quantitative Methods**

  The water management objectives for the SBC SARW will be met through various multi-benefit stormwater management projects located within the SBC SARW. This section presents the approach taken to develop quantitative methodologies for integrated identification, prioritization, and analysis of multi-benefit projects and programs. Existing hydrologic/hydraulic models, water quality models, and other Geographic Information System (GIS) and spreadsheet-based decision support tools were reviewed to determine if they could be used to support the metric-based benefit analysis and prioritization of projects. A weighted scoring approach to conduct the metric-based analysis was established and is described in this section.

- **Section 6 – Project Identification and Prioritization**

  The approach described in the previous section was used to quantify benefits and prioritize projects. This section summarizes the results of the analysis and includes an assessment of the stormwater management objectives.

- **Section 7 – Implementation Strategy and Schedule**

  The implementation strategy is described in this section for future implementation of the projects/programs identified in the previous sections. The implementation approach, resources, schedule, funding, adaptive management, and performance assessments are described in detail. The information contained in this section supports the next steps following the SWRP approval.

- **Section 8 – Education, Outreach, and Public Participation**

  This section discusses the education/outreach materials and strategies used to engage the public and stakeholders. The approach, implementation, and outcomes are detailed to demonstrate how the community and stakeholders impacted the SWRP development.

2. Watershed Identification

This section identifies and describes the SBC SARW, its surface water and groundwater resources, and its internal boundaries, including public agency (jurisdictional), water and wastewater services, groundwater basin, and land use boundaries. This section includes a description of the native habitats, parks, and open spaces within the watershed. In total, the SBC SARW area is 1,015 square miles, or 649,513 acres, with a population of just under two million. The SBC SARW is further subdivided into 14 subwatersheds. The watershed characteristics presented in this section were considered as part of the project and program identification, quantification, and prioritization further described in this SWRP.

2.1 San Bernardino County Santa Ana River Watershed

The SARW encompasses nearly 2,650 square miles of mountains, foothills, and valleys, and is home to more than six million people. The watershed contains portions of Los Angeles, Orange, Riverside, and San Bernardino Counties, as depicted in **Figure 2-1**.

The SARW is characterized by the flat, arid basin of southwestern San Bernardino and western Riverside Counties and the coastal plain of north-central Orange County, and is bisected by the Santa Ana Mountains, which runs northwest to southeast, nearly perpendicular to the Santa Ana River. The Santa Ana River begins in the San Bernardino Mountains, upstream of Seven Oaks Dam, and drains into the Pacific Ocean in the City of Huntington Beach. There are over 50 major tributaries to the once free-flowing and perennial river, some of which are identified in **Figure 2-2**. Ancient igneous, metamorphic, and sedimentary rock underlies and forms the geologic base of the Santa Ana River. Most of the strata in the flat valleys and basins of the watershed are underlain by thousands of feet of sediment deposited by transient seas during climate changes and erosion (Mitchell, 2006).

Diverse and complex faulting and geologic instability have shaped the SARW. The San Andreas Fault runs across the northern section of the watershed and is responsible for causing the uplift of the San Bernardino Mountains, part of the Transverse Ranges of Southern California. The Elsinore–Whittier Fault Zone crosses the Santa Ana River further downstream, near the Orange County/Riverside County boundary. This fault caused the rising of the Santa Ana Mountains, Puente Hills, East Orange Hills, Chino Hills, Loma Ridge, and the other mountain ranges and ridges that run northwest-southeast across the lower section of the watershed, comprising the coastal Peninsular Ranges. While the larger San Andreas Fault allowed the Transverse Ranges to rise to above 10,000 feet in many places, the Peninsular Ranges are only about half that height.

The SBC SARW boundary, as illustrated in **Figure 2-2**, encompasses the upper limits or the headwaters of the Santa Ana River, with the SBC jurisdictional boundary as the southern limit. The jurisdictional boundary is utilized for the SWRP area instead of the hydrologic boundary. This approach was taken in an effort to have a more centralized analysis and planning study as compared to the efforts of the local IRWM (SAWPA) with the OWOW Plan, which encompasses the full SARW.

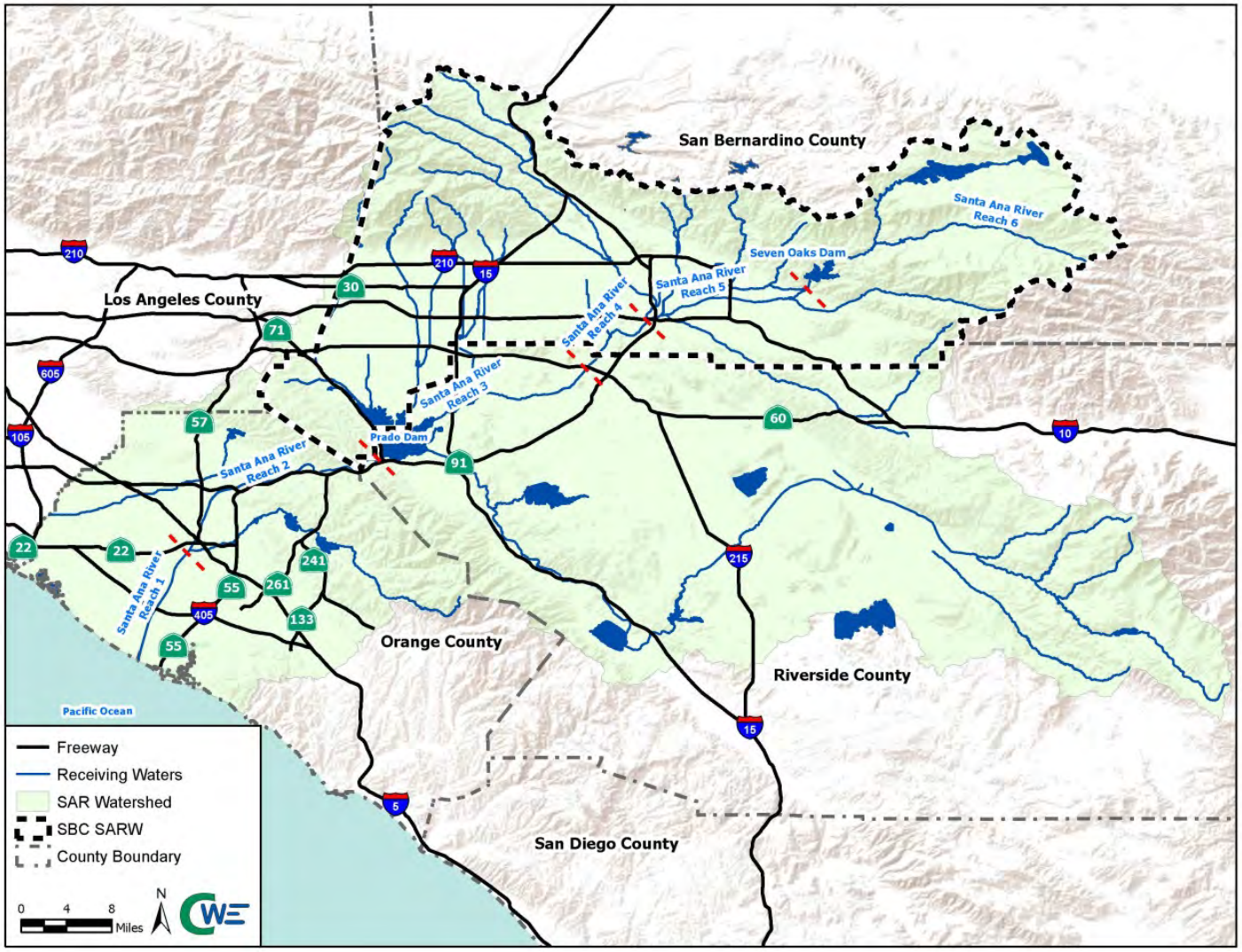


Figure 2-1 Santa Ana River Watershed

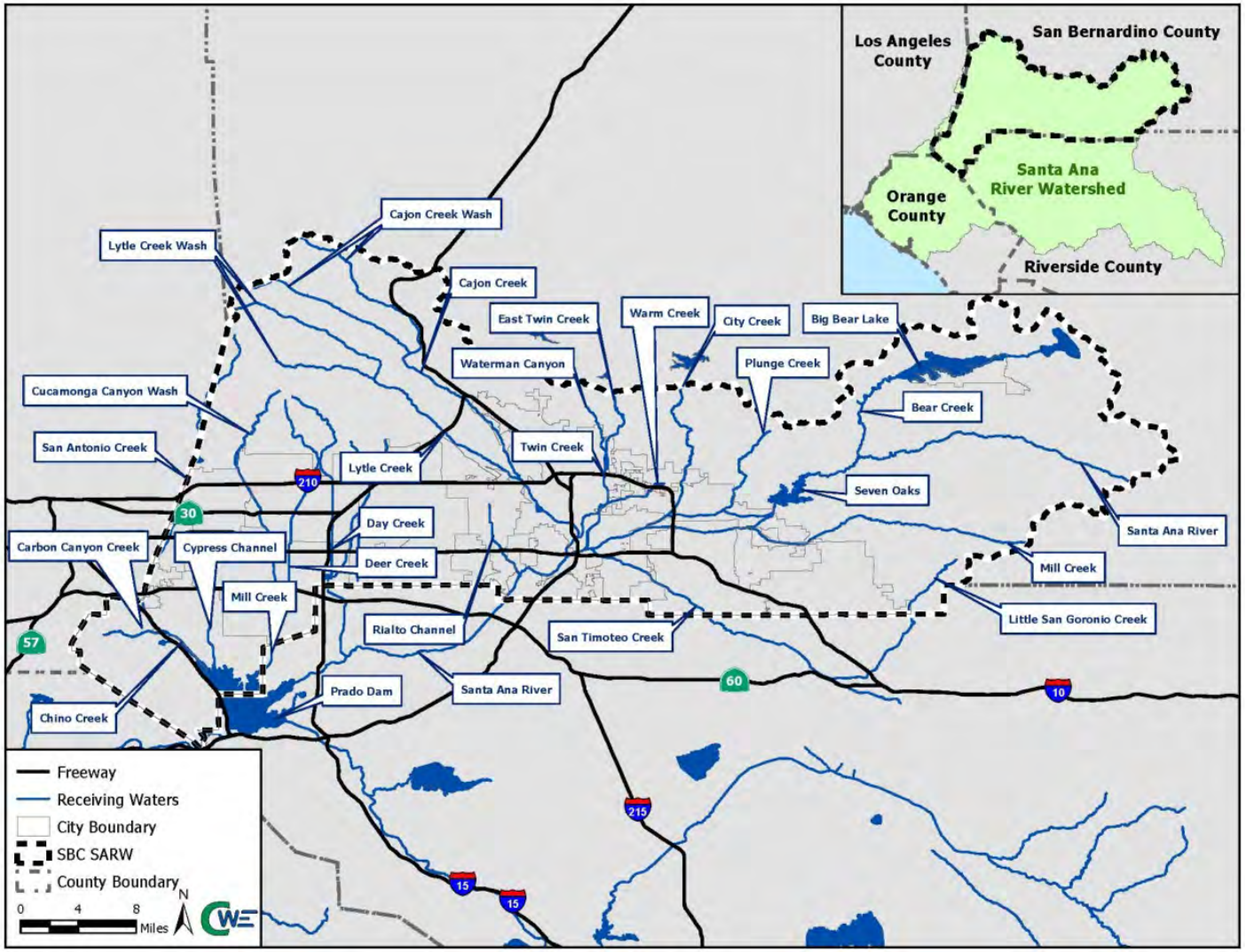


Figure 2-2 San Bernardino County Portion of the Santa Ana River Watershed

2.1.1 Internal Boundaries

The SBC SARW area encompasses several boundaries such as public agency (jurisdictional), water service, wastewater service, groundwater basin, and land use boundaries. The following subsections describe these boundaries within the SBC SARW.

2.1.1.1 Jurisdictional Boundaries

Sixteen cities encompass the SBC SARW area as well as Unincorporated Areas (UA) of SBC as shown in **Figure 2-3**. The City of San Bernardino is the largest city, followed by the Cities of Ontario, Chino Hills, Fontana, Rancho Cucamonga, Redlands, Chino, Yucaipa, Rialto, Highland, Colton, Upland, Loma Linda, Big Bear Lake, Montclair, and Grand Terrace. **Table 2-1** provides a summary of the area from each jurisdiction that makes up the SBC SARW.

Table 2-1 Jurisdictional Areas within SBC SARW

Jurisdiction	Area (Acres)	Percent (%)
Big Bear Lake	4,181	0.6
Chino	18,978	2.9
Chino Hills	28,640	4.4
Colton	10,265	1.6
Fontana	27,156	4.2
Grand Terrace	2,241	0.4
Highland	12,089	1.9
Loma Linda	4,811	0.7
Montclair	3,531	0.5
Ontario	32,005	4.9
Rancho Cucamonga	25,517	3.9
Redlands	23,313	3.6
Rialto	14,314	2.2
San Bernardino	38,171	5.9
Upland	10,016	1.5
Yucaipa	17,852	2.8
SBC UA	376,433	58.0
Total:	**649,513**	**100**

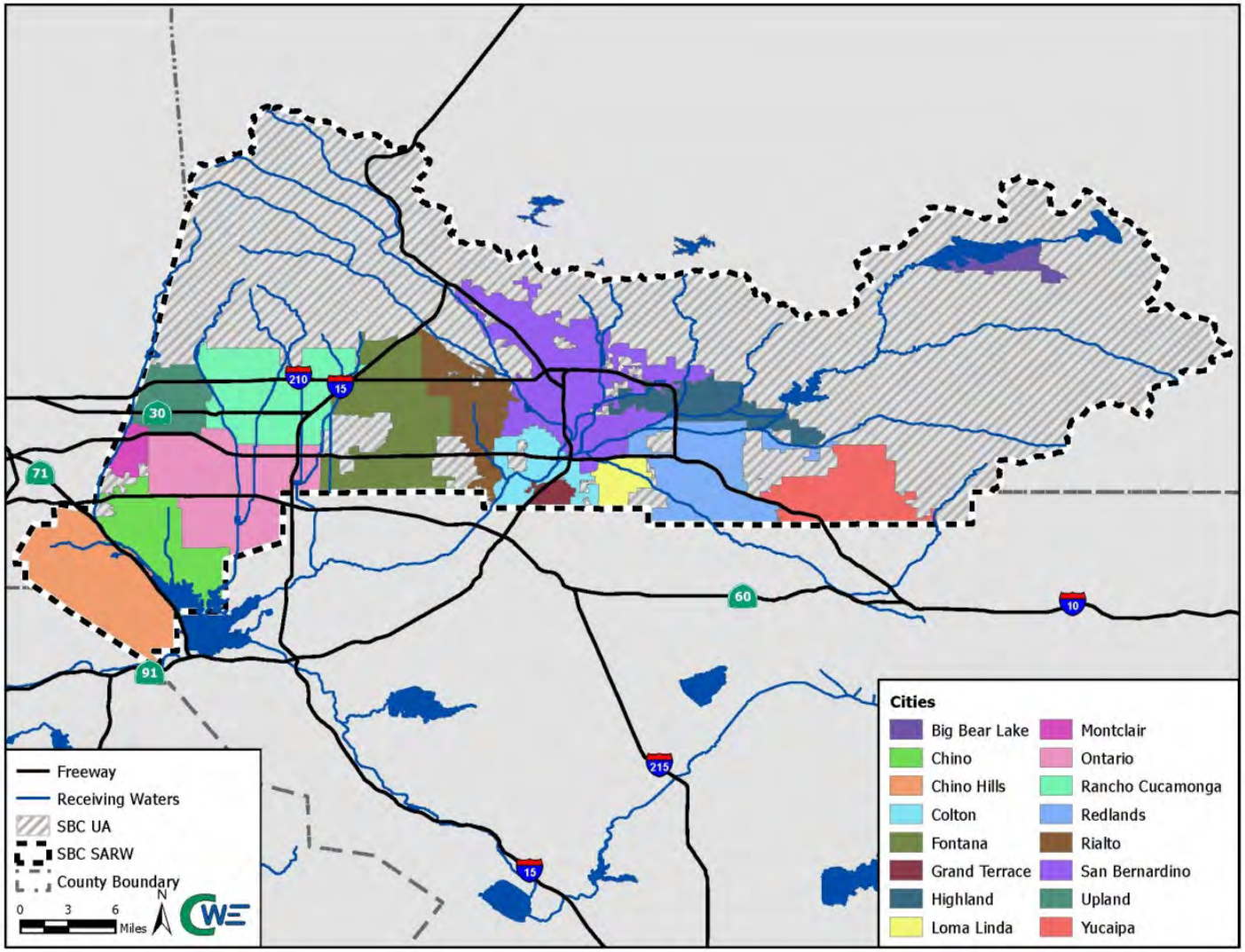


Figure 2-3 Jurisdictional Boundaries within the SBC SARW Area

2.1.1.2 Water and Wastewater Service Areas

There are three main water suppliers, San Bernardino Valley Municipal Water District (SBVMWD), Inland Empire Utilities Agency (IEUA), and Big Bear Municipal Water District (BBMWD) located within the SBC SARW area, as presented in **Figure 2-4**. **Table 2-2** summarizes the estimated total annual water demands associated with these water suppliers based on their Urban Water Management Plans (UWMPs).

Table 2-2 Projected Water Demands from the Water Suppliers

Water Supplier	Total Water Demands (AF)				
	2020	2025	2030	2035	2040
SBVMWD[a]	250,027	260,542	270,747	281,697	289,821
IEUA	210,588	225,923	242,732	254,721	278,017
BBMWD	6,500	6,500	6,500	6,500	6,500

[a] Includes water supplied on BBMWD's behalf for in-lieu of Big Bear Lake releases to Bear Valley Mutual Water Company (BVMWC).

SBVMWD was formed in 1954, under the Municipal Water District Act of 1911, as a regional agency to plan for long-range water supply in the San Bernardino Valley. SBVMWD covers approximately 221,820 acres within the SBC SARW. SBVMWD spans the eastern two-thirds of the San Bernardino Valley, and includes a portion of Yucaipa Valley. SBVMWD is responsible for long-range water supply management which includes local groundwater basins and replenishing these groundwater basins with imported water from the California State Water Project. SBVMWD has specific responsibilities for monitoring groundwater supplies in the San Bernardino Basin Area and Rialto-Colton Subbasin, and for a portion of the minimum Santa Ana River flow required at the Riverside Narrows (SBVMWD, 2016).

IEUA was formed in 1950 as the Chino Basin Municipal Water District. The same year, the agency joined the Metropolitan Water District (MWD) of Southern California. In 1998, the agency changed its name to IEUA. IEUA covers approximately 152,800 acres within the SBC SARW area. IEUA is focused on providing four key services: 1) treating wastewater; 2) developing recycled water, local water resources, and water use efficiency programs that will reduce the region's dependence on imported water supplies and drought-proof the service area; 3) converting biosolids and waste products into a high quality compost made from recycled materials; and 4) generating electrical energy from renewable sources (IEUA, 2016b).

BBMWD was formed in 1964 and is responsible for the overall management of Big Bear Lake (BBL). The primary goals of the BBMWD are the stabilization of the water level at BBL, given the availability of water and financing; maintaining the surrounding lake environment; and maintaining the irrigation interest of downstream communities. Through a judgment executed in 1977, BBMWD purchased from BVMWC the BBL bottom, Bear Valley Dam, and the right to utilize and manage the surface of BBL for recreation and wildlife. In return, deliveries to reduce the amount of lake releases to BVMWC were capped at 65,000 acre-feet in any ten-year period. These deliveries are made in the form of lake releases or other sources "in-lieu" of lake releases (in-lieu water deliveries) (SBVMWD, 2016).

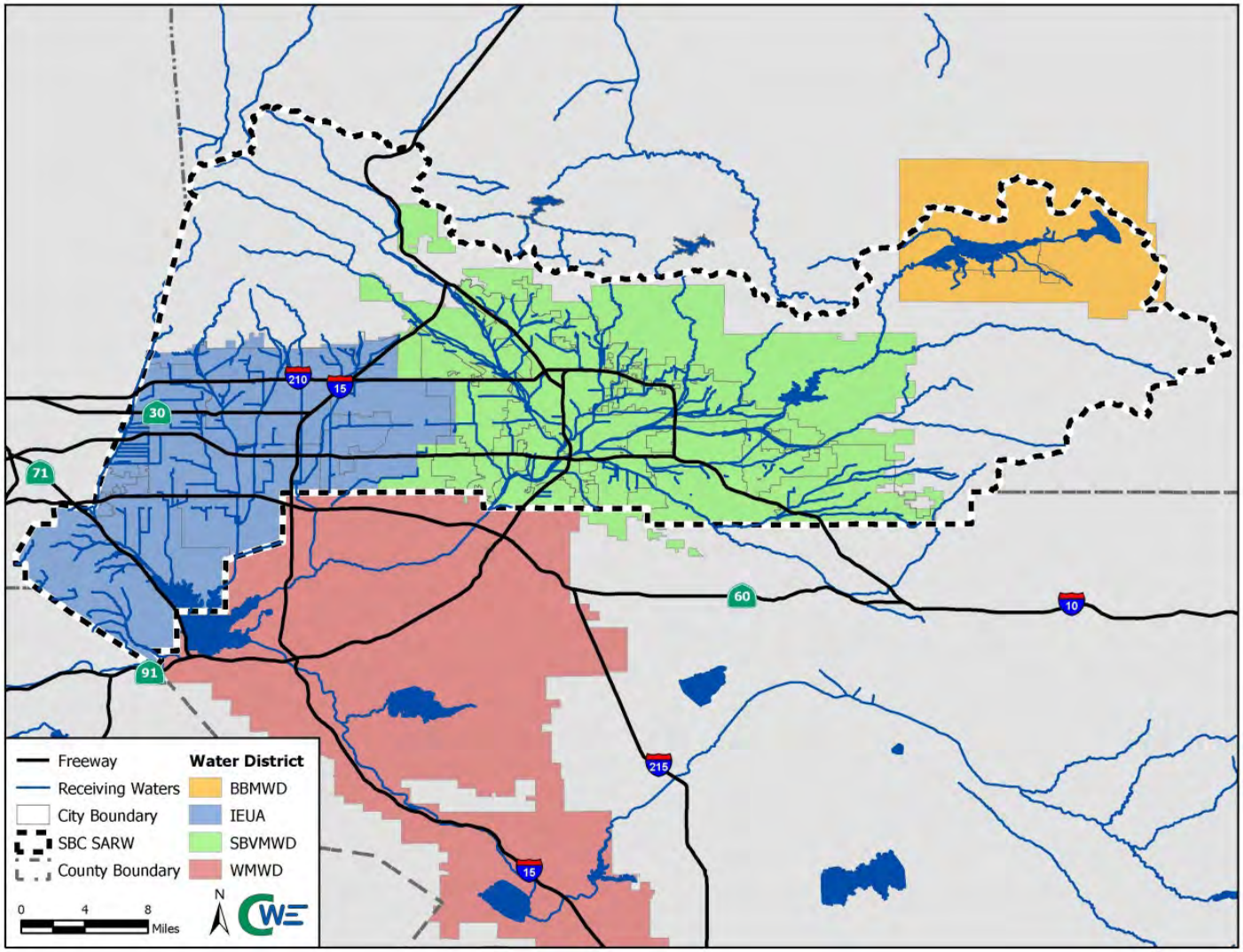


Figure 2-4 Water Supplier Boundaries within the SBC SARW Area

Western Municipal Water District (WMWD) is located beyond the boundary of the SBC SARW; however, WMWD has groundwater rights within the SBC SARW area. The water pumped out from the SBC SARW area is transported into WMWD's Riverside Division through an agreement with the City of Riverside.

Thirty-one water purveyors are located within the SBC SARW, as summarized in **Table 2-3**. The table summarizes the estimated volume of potable water supplied in acre-feet (AF) in 2015.

Table 2-3 Water Supplied through Water Purveyors in 2015

Water Purveyor	Population Served	Potable and Drinking Water Supplied (AF)
SBVMWD (based on individual reports/Annual Reports by each purveyor)		
City of Colton	45,496	9,008
City of Loma Linda	23,298	4,682
City of Redlands	85,276	21,290
City of Rialto	54,453	8,771
East Valley Water District (EVWD)	104,457	16,942
Marygold Mutual Water Company	6,818	--
Muscoy Mutual Water Company	13,255	--
Riverside Highland Water Company (RHWC)	16,007	2,964
San Bernardino Municipal Water District (SBMWD)	199,657	36,035
San Bernardino Valley Conservation District	--	--
South Mesa Water Company	4,830	--
Terrace Water Company	2,200	--
West Valley Water District (WVWD)	80,161	17,131
Western Heights Water Company	7,120	--
Yucaipa Valley Water District (YVWD)	44,745	9,595
Subtotal:	**687,773**	**126,418**
IEUA (based on Fiscal Year 2015-16 data presented in the Annual Water Use Report)		
City of Chino	74,000	20,163
City of Chino Hills	77,600	12,993
City of Ontario	168,780	36,096
City of Upland	75,790	16,807
Crawford Canyon Municipal Water Company	10	--
Cucamonga Valley Water District	200,460	40,166
Fontana Water Company	215,500	32,681
Monte Vista Water District	54,200	8,012
San Antonio Water Company	3,150	1,882
Subtotal:	**869,490**	**168,800**
BBMWD		
BVMWC	--	--
Outside of Agency Areas (based on individual reports/Annual Reports by each purveyor)		
City of BBL Water Department	15,520	2,166
Big Bear City Community Service District	11,528	890
Fallsvale Service Company	959	200

Water Purveyor	Population Served	Potable and Drinking Water Supplied (AF)
Lake Arrowhead Community Services District	7,183	1,600
Lytle Creek Springs Water Company	475	--
Running Springs Water District	4,806	350
Total:	**1,597,734**	**300,424**

-- Information not available at this time

Sixteen out of the 31 water purveyors also provide wastewater services along with the SBC Special Districts Department, which only provides wastewater services and is not a water purveyor. The water agencies that also provide wastewater services are the Cities of Colton, Fontana, Grand Terrace, Loma Linda, Rancho Cucamonga, Redlands, and Rialto, Big Bear Area Regional Wastewater Agency, Big Bear City Community Services District, EVWD, IEUA, Lake Arrowhead Community Services District, Lytle Creek Community Services District, Running Springs Water District, SBMWD, and YVWD. In addition, approximately 2,300 parcels within the SBC SARW area utilize Onsite Wastewater Treatment Systems (OWTS or septic systems). **Figure 2-5** depicts the locations of the OWTS within the SBC SARW area.

2.1.1.3 Groundwater Basin Boundaries

Six groundwater basins are located within the SBC SARW area totaling approximately 340,412 acres, all of which are located within the South Coast Hydrologic Region. The six basins included Bear Valley, Big Meadows Valley, Coastal Plain of Orange County, San Gabriel Valley, Seven Oaks Valley, and Upper Santa Ana Valley, as shown in **Figure 2-6**. The largest groundwater basin, as summarized in **Table 2-4**, is the Upper Santa Ana Valley basin covering approximately 46 percent of the SBC SARW area. The Upper Santa Ana Valley basin is further divided into eight subbasins which are Bunker Hill, Cajon, Chino, Cucamonga, Rialto-Colton, Riverside-Arlington, San Timoteo, and Yucaipa, as illustrated in **Figure 2-7**. Existing groundwater quality data is summarized in **Section 3.2**.

Table 2-4 Groundwater Basins within the SBC SARW

Groundwater Basin	Area (Acres)	Percent of SBC SARW (%)
Bear Valley	18,573	2.9
Big Meadows Valley	14,162	2.2
Coastal Plain of Orange County	134	< 0.1
San Gabriel Valley	2,756	0.4
Seven Oaks Valley	4,075	0.6
Upper Santa Ana Valley	300,712	46.3
Total:	**340,412**	**52.4**

The groundwater basins do not line up exactly with the surface watersheds described in **Section 2.2**. Surface watersheds are based on surface topography and manmade structures (storm conveyances, basins, pumps, etc.). Groundwater basin delineation is dependent on hydraulic properties of an aquifer, input and outflow, and geological factors. Surficial aquifers (water table) generally mimic surface watersheds and their flow does not cross surface boundaries. Deeper (confined) aquifers are less likely to conform to surface watersheds. Some of the groundwater basins/subbasins depicted below are confined and do not line up with the surface watersheds (DNR, 2018).

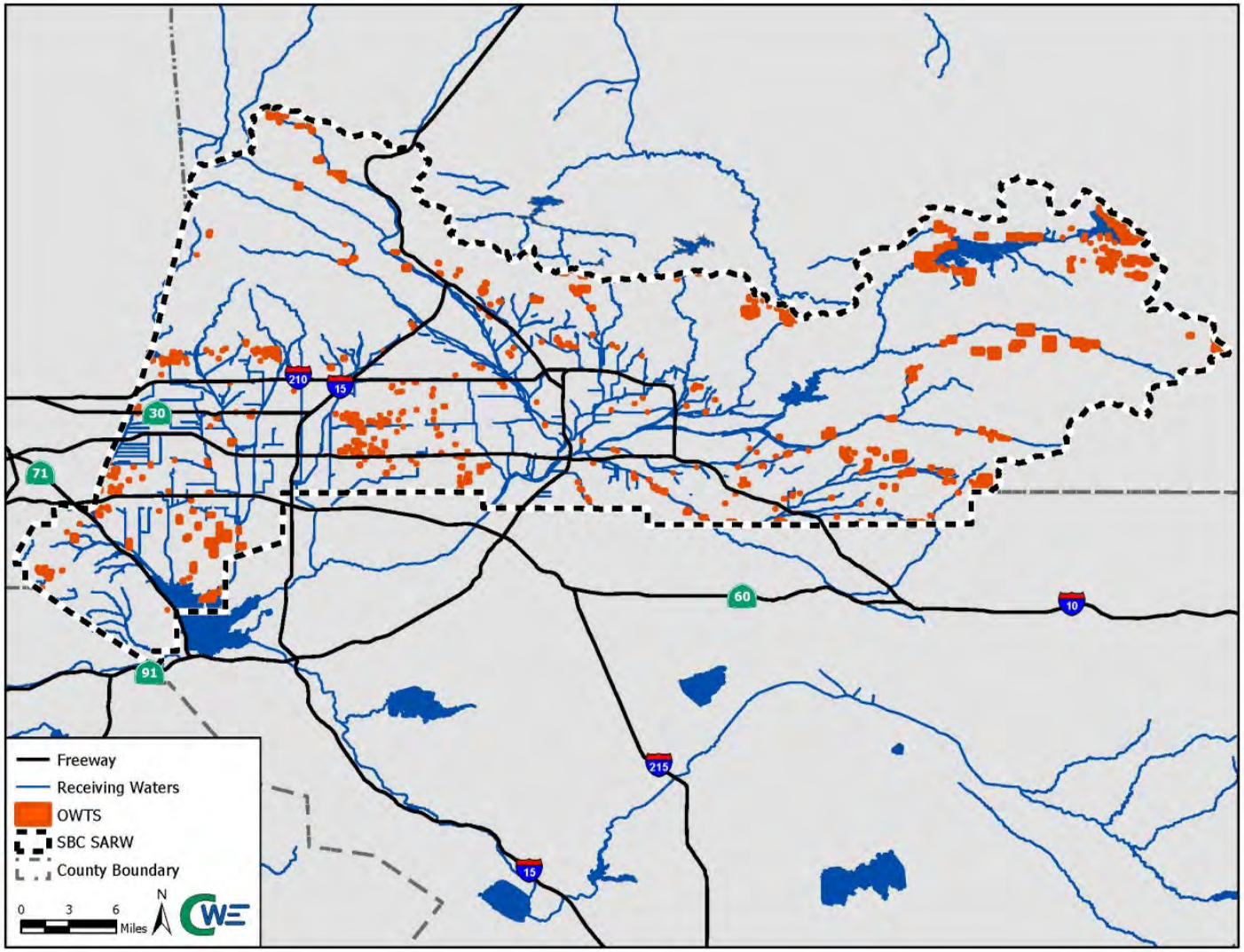


Figure 2-5 Onsite Wastewater Treatment Systems within the SBC SARW Area

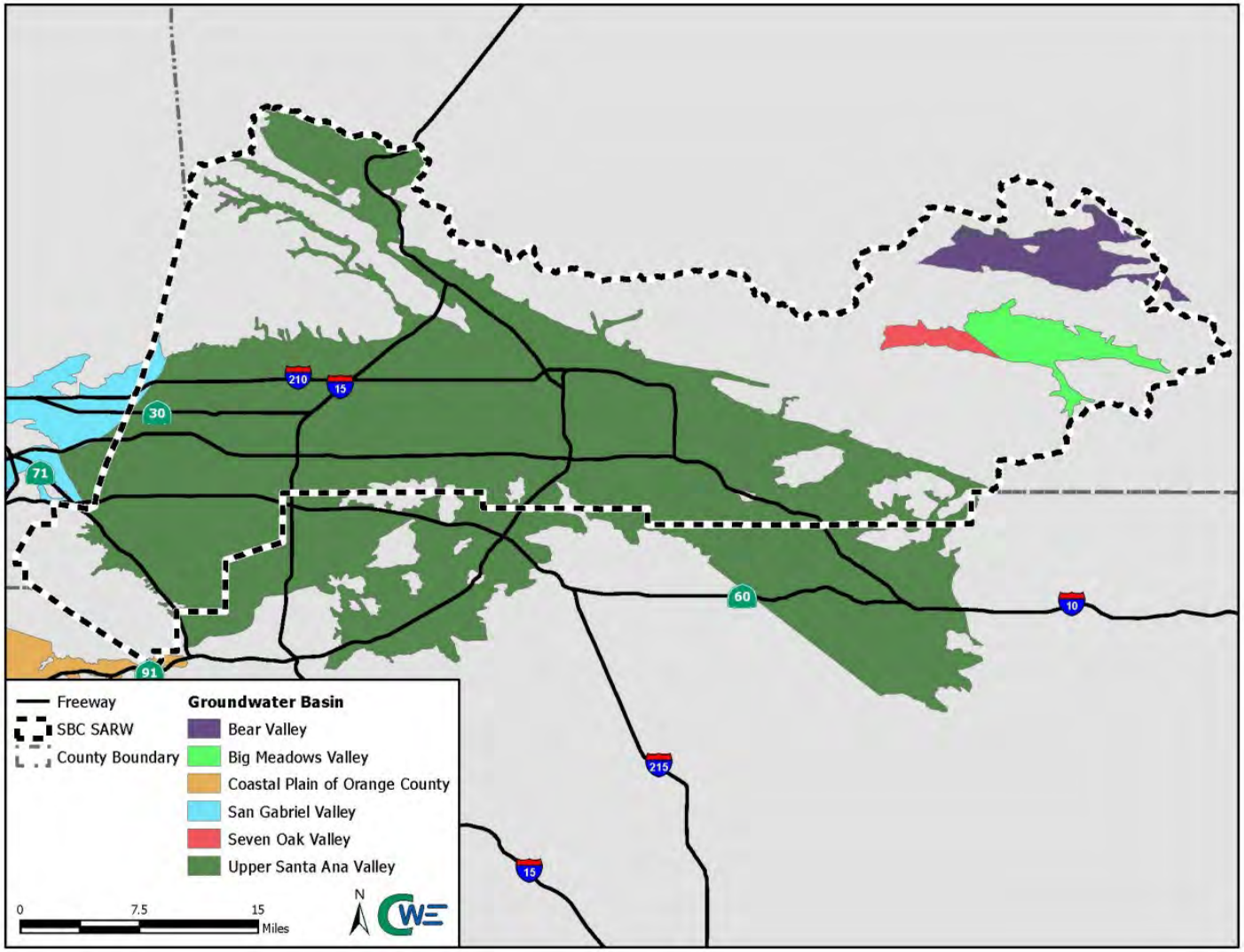


Figure 2-6 Groundwater Basins within the SBC SARW Area

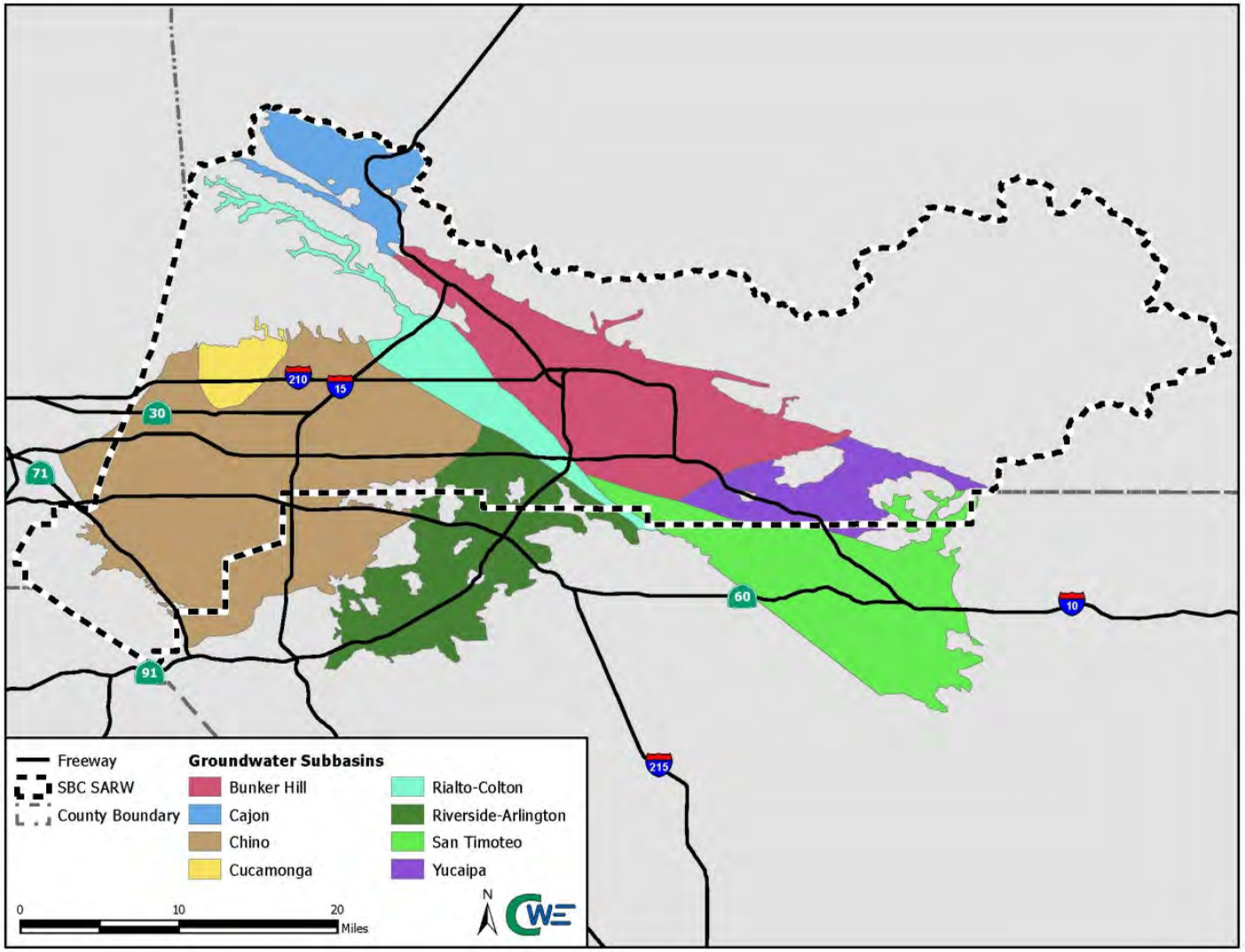


Figure 2-7 Upper Santa Ana Valley Groundwater Subbasins within the SBC SARW Area

2.1.1.4 Land Use

Land use within the SBC SARW area is shown in **Figure 2-8.** General Plan land use (2013) information from the San Bernardino Associated Governments (SANBAG) was used to categorize land use within the SBC SARW area. The General Plan land use represents the projected future built out land use, rather than the existing. This is more appropriate for planning purposes as compared to existing land use. The 2013 SANBAG General Plan land use data includes a total of 22 land use descriptions. The land use descriptions were re-categorized into seven land use categories which include agriculture, commercial, education, industrial, residential, transportation, and vacant. **Attachment B** provides the list of land use descriptions and the assigned land use category. The predominant land use category is vacant land, as tabulated in **Table 2-5**, which is reflective of the large mountainous areas within the SBC SARW. Of the planned urbanized area, the residential land use is the largest area covering 162,877 acres or 25.1 percent of the total SBC SARW area, while the education land use category makes up the lowest percentage.

Table 2-5 Categorized Land Use of Total SBC SARW Area

Land Use	Area (Acres)	Percent (%)
Agriculture	9,307	1.4
Commercial	45,933	7.1
Education	6,371	1.0
Industrial	42,094	6.5
Residential	162,877	25.1
Transportation	8,359	1.3
Vacant	374,572	57.6
Total:	**649,513**	**100.0**

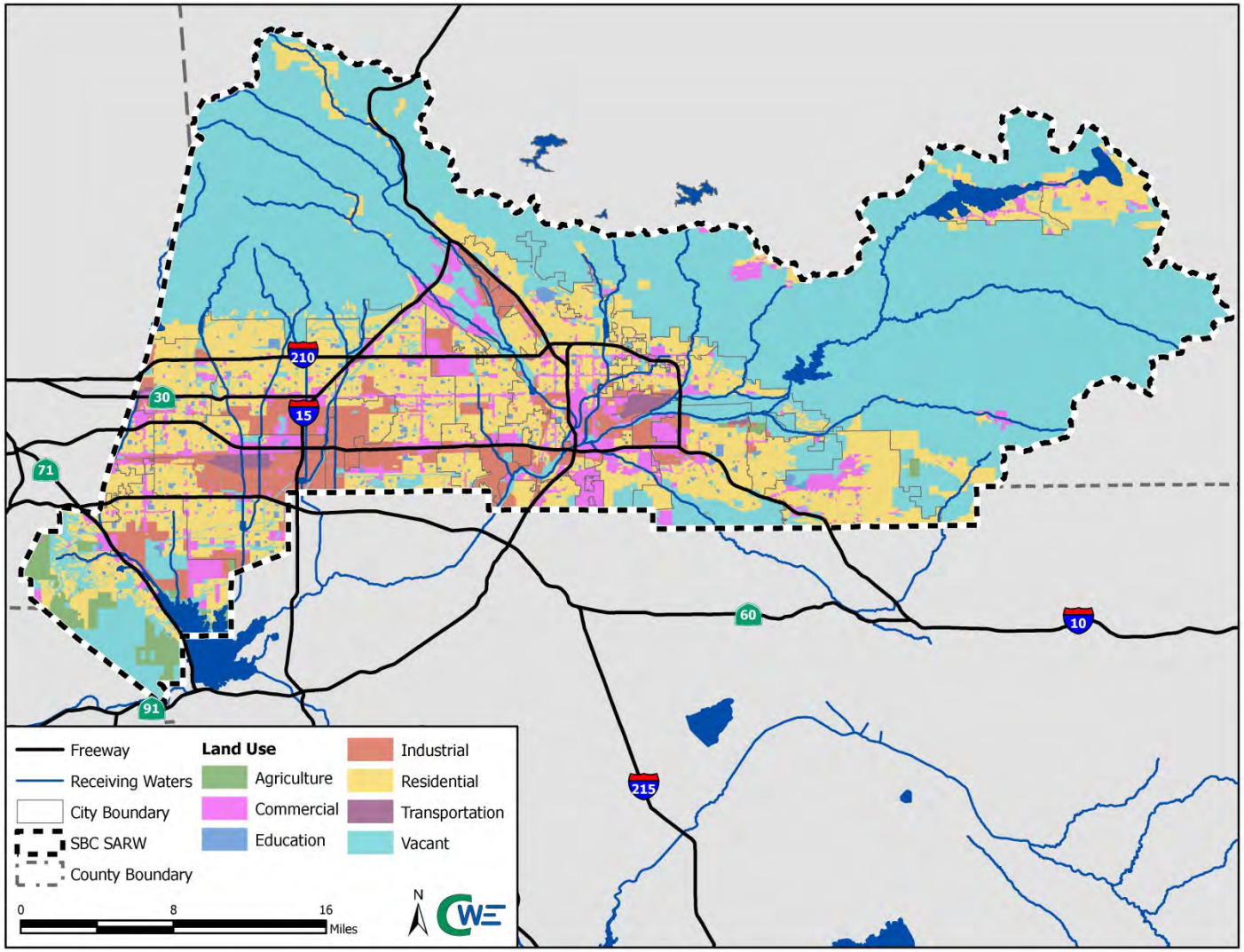


Figure 2-8 General Plan Land Use within the SBC SARW Area

2.1.2 Surface Water

The Santa Ana River is 96 miles long and divided into six reaches. The river starts upstream of Seven Oaks Dam and discharges into the Pacific Ocean, as seen in **Figure 2-1**. The Santa Ana River begins in Santa Ana Canyon in the Southern San Bernardino Mountains, on the northern flank of San Gorgonio Mountain. The river initially flows west through a broad and deep gorge, and receives its first major tributary, Bear Creek, which flows southwest from BBL. Flows from this portion of the Santa Ana River consist mostly of snowmelt and storm runoff in undeveloped mountainous area, resulting in good water quality. The river turns south, passing westward towards Seven Oaks Dam and the City of San Bernardino. As it passes through to the urban areas, it receives flow from City Creek and enters a flood control channel flanked by earthen levees on both sides. Not long after the confluence with City Creek, Lytle Creek connects with the Santa Ana River. Lytle Creek is one of the largest tributaries of the Santa Ana River, rising in three forks of the San Gabriel Mountains and flowing southeast, becoming the Lytle Creek Wash before discharging into the main stem. From there, the Santa Ana River flows southwest, where the Rialto Channel confluences inside the SBC boundary, continuing on to Riverside County. Further downstream, flows from Day Creek join the main stem before discharging into the flood control reservoir formed by Prado Dam. Within the SBC SARW, three other major tributaries of the river join the reservoir area (Prado Dam): Chino Creek, Cypress Channel, and Mill Creek (Prado Area). After flowing out of the Prado Dam, the Santa Ana River flows between the northern Santa Ana Mountains and Chino Hills, crosses into Orange County and discharges into the Pacific Ocean. Details on the surface water quality are included in **Section 3**.

2.1.3 Native Habitats, Parks, and Open Space

SBC consists of three sub-regions: valley, mountain, and desert regions. The SBC SARW area is within two of these regions: valley and mountain regions. These two regions contain diverse habitats, differing in climates and geography which in turn sustain differing biological environments.

2.1.3.1 Valley Region

The valley region is urbanized with few existing natural open space areas (SBC, 2007b). The habitats within the undeveloped areas of the valley are alluvial sage scrub, chaparral, coastal sage scrub, deciduous woodlands, grasslands, riverine, and wetlands (SBC, 2007b). Vegetation in urbanized areas consists primarily of introduced landscape species. The most sensitive vegetation types found within the study area are wetlands, including riparian woodland, riparian scrub, and freshwater marsh. The valley region provides habitat to several sensitive species such as burrowing owl, California bedstraw, coastal California gnatcatcher, least bell's vireo, Los Angeles pocket mouse, northwestern San Diego pocket mouse, rufous-crowned sparrow, San Bernardino kangaroo rat, San Diego horned lizard, Stephens' kangaroo rat, southwestern willow flycatcher, and western yellow-billed cuckoo (SBC, 2007b). Natural preserves and parks found within the valley region are illustrated in **Figure 2-9** and further detailed below.

- **Chino Hills State Park** – Chino Hills State Park is an open-space area in the hills of Santa Ana Canyon (SBC, 2017d). The State Park is a critical link in the Puente-Chino Hills biological corridor. It encompasses stands of oaks and sycamores, Riversidean sage scrub, and grassy hills that stretch nearly 31 miles, from the Santa Ana Mountains to the Whittier Hills. The Riversidean sage scrub community supports a sensitive bird species, the coastal California gnatcatcher.

- **Cucamonga-Guasti Regional Park** – Cucamonga-Guasti Regional Park is a 150-acre park located in the City of Ontario. It offers a wide range of activities, including two lakes for fishing, a swim complex with water slides, zero depth water play park, picnic tables, and group picnic shelters (SBC, 2017d).
- **Glen Helen Regional Park** – Glen Helen Regional Park is located at the base of the chaparral covered hills of the Cajon Pass, the park offers scenic views of both the San Gabriel and San Bernardino Mountains. The 1,340-acre park offers recreational activities which include two lakes for fishing, a swim complex with pool, sandy area, dual water slides, zero depth water play park, large group shelter picnic areas, and amphitheater (SBC, 2017d).
- **North Etiwanda Preserve** – The preserve encompasses 763 acres primarily of a unique Riversidean alluvial fan sage scrub habitat that also contains a water marsh (SBC, 2007b). The area was acquired in 1998 by SANBAG, as mitigation for the Interstate 215 Freeway extension. It was later assigned to SBC for management in conjunction with the CDFW and an advisory committee. Ongoing conservation efforts have enabled expansion of the Preserve to over 1,200 acres.
- **Prado Basin Mitigation Area** – An agreement in 1995 between the Orange County Water District (OCWD), USACE, and USFWS, resulted in the water level behind Prado Dam to be raised, doubling the amount of water stored behind the dam. The agreement between the agencies resulted in cooperative efforts to enhance the water conservation and environmental values of Prado Basin, and to also enhance the breeding grounds of the endangered least bell's vireo. The OCWD owns 2,150 acres behind Prado Dam in Riverside County. There are nearly 465 acres of constructed wetlands within the OCWD property and adjacent lands, which have effectively demonstrated the ability to reduce nitrogen levels in the Santa Ana River.
- **Prado Regional Park** – Prado Regional Park is in the Chino Valley Basin where San Bernardino, Riverside, Orange, and Los Angeles Counties connect. The name Prado is derived from California's early Spanish days when the countryside was known as a "prado" or meadow. This park offers a number of recreational activities which include fishing, camping, hiking, biking nature trails, meeting room, disc golf, and picnic facilities.
- **Santa Ana Wooly Star and Slender-Horned Spine Flower Mitigation Lands in the Upper Santa Ana Wash** – The 760-acre wooly star preserve was established by the USACE along the Santa Ana River Wash as mitigation for the Seven Oaks Dam project.
- **Vulcan Materials Alluvial Fan Sage Scrub Mitigation Bank** – Vulcan Materials established a 1,378-acre habitat conservation management area along a six mile stretch of Cajon Creek (SBC, 2007b). Enclosed within this sage and scrub community are 24 sensitive species, including numerous wildflowers, the coastal California gnatcatcher, and the endangered San Bernardino kangaroo rat.
- **Yucaipa Regional Park** – The Yucaipa Regional Park is located near Oak Glen, Redlands, and mountain communities. It includes a wide range of outdoor recreation such as fishing in three lakes, a swim complex with water slides, sandy beach area, and picnic shelters (SBC, 2017d).

2.1.3.2 Mountain Region

The mountain region lies in the southwestern portion of SBC and contains the San Bernardino Mountains and the eastern end of the San Gabriel Mountains. The major habitats found in the region include chaparral, conifer forest, sage shrubs, oak woodlands, wetlands (including woodlands, scrub, marsh,

meadows, and riverine), and the relic pavement plains (SBC, 2007c). There are 71 threatened or endangered wildlife species inhabiting the forest. The mountain region provide habitat to several sensitive species such as the California bald eagle, mountain yellow-legged frogs, southern rubber boa, peregrine falcons, bighorn sheep, and many endangered plants (SBC, 2007c). Bear Creek is a CDFW designated wild trout stream and contains high quality riparian resources. Low-elevation riparian resources include cottonwood-willow, sycamore/coast live oak, and white alder communities. Locally rare riparian resources include the aspen groves in the San Bernardino Mountains.

The CDFW recognizes 14 Areas of Special Biological Importance (ASBIs) within the mountain region of SBC. Key areas are identified among the ASBIs that support herds of both resident and seasonally migratory mule deer. Good deer fawning areas, generally located near wet meadows and riparian thickets, occur from Manzanita Flat to Plunge Creek in the Alder Creek area and near Keller Meadows and the forks of Plunge Creek, east of Harrison Mountain. Deer winter ranges occur north of Barton Flats and summer ranges occur northwest of Delamar Mountain. The CDFW also recognizes principal wintering area for waterfowl migrating along the Pacific Flyway. Waterfowl have been observed at Baldwin Lake and BBL within the mountain region. The lake areas also provide wintering habitat for the bald eagle, and recognized by the CDFW as ASBIs. Natural preserves and parks found within the region are illustrated in **Figure 2-10** and further detailed below.

- **Baldwin Lake Ecological Reserve** – The 156-acre Baldwin Lake Ecological Reserve includes a unique pebble plain plant community as well as vernal wet meadow habitat. The site is also significant for its wintering population of bald eagles. The CDFW purchased the property from the Natural Conservancy in 1989, and designated it as an ecological reserve in 1991. It was acquired to protect existing populations of rare and endangered plants.
- **Bluff Lake Reserve** – The Bluff Lake Reserve is an ecological reserve with towering pines, a 20-acre lake and meadow, and majestic outcrops of quartz monzonite. The reserve includes Southern California's finest intact mountain marsh and meadow complex that contains the federally threatened Bear Valley bluegrass, the federally endangered Big Bear checkerbloom, and California dandelion. Botanically, the meadow is remarkable with 16 species of sedges, eight species of wire grass, and 14 species of native grass. Mature forests of lodgepole pine, Jeffrey pine, and white fir surround the meadow.
- **Castle Glen Bald Eagle Preserve** – The 125-acre preserve is situated in the Castle Glen area of BBL and was set aside as habitat for the bald eagle. Bald eagles have been known to migrate here during winter, from frigid nesting grounds in the Pacific Northwest, to roost in scraggly pine trees and hunt for fish and waterfowl in the lake. Many bald eagles gather at Baker Pond, a shallow waterfowl refuge at the eastern end of the 15-mile-long lake where plentiful tall pine trees provide the federally endangered birds with a commanding view of hunting grounds below.
- **Cucamonga Wilderness Area** – The Cucamonga Wilderness Area is composed of 12,781 acres along the boundaries of the Angeles National Forest – San Gabriel Mountains National Monument and the San Bernardino National Forest (USDA, 2017a). This wilderness consists of a sub-alpine setting, which is primarily composed of mixed conifers ranging in age class such as Ponderosa, Jeffrey, and Douglas-fir pines. Numerous wildlife species do well in the area, including deer, bear, mountain lions, and Nelson bighorn sheep (USDA, 2017a).

- **San Gorgonio Wilderness Area** – The 56,749-acre area is located in the eastern San Bernardino Mountains (USDA, 2017b). San Gorgonio Wilderness Area is the largest established wilderness area in Southern California and one of the most publicly used within the nation. The wilderness is part of the eastern slope of the San Bernardino Mountains, with topography rapidly changing from low rolling foothills and canyons to steep rugged mountains. The wilderness reflects a transition between desert, coastal, and mountain environments, including the different types of vegetation representative of each elevation due to the elevation gradient (USDA, 2017b).
- **Wildland Park, Pebble Plain Preserve** – Pebble Plain geologic formation only occurs in Big Bear and Holcomb Valley and nowhere else in the world. As a result, the flora and fauna growing on the Pebble Plain are unique to the areas and interested groups have joined together to ensure plants and insects will be forever protected.

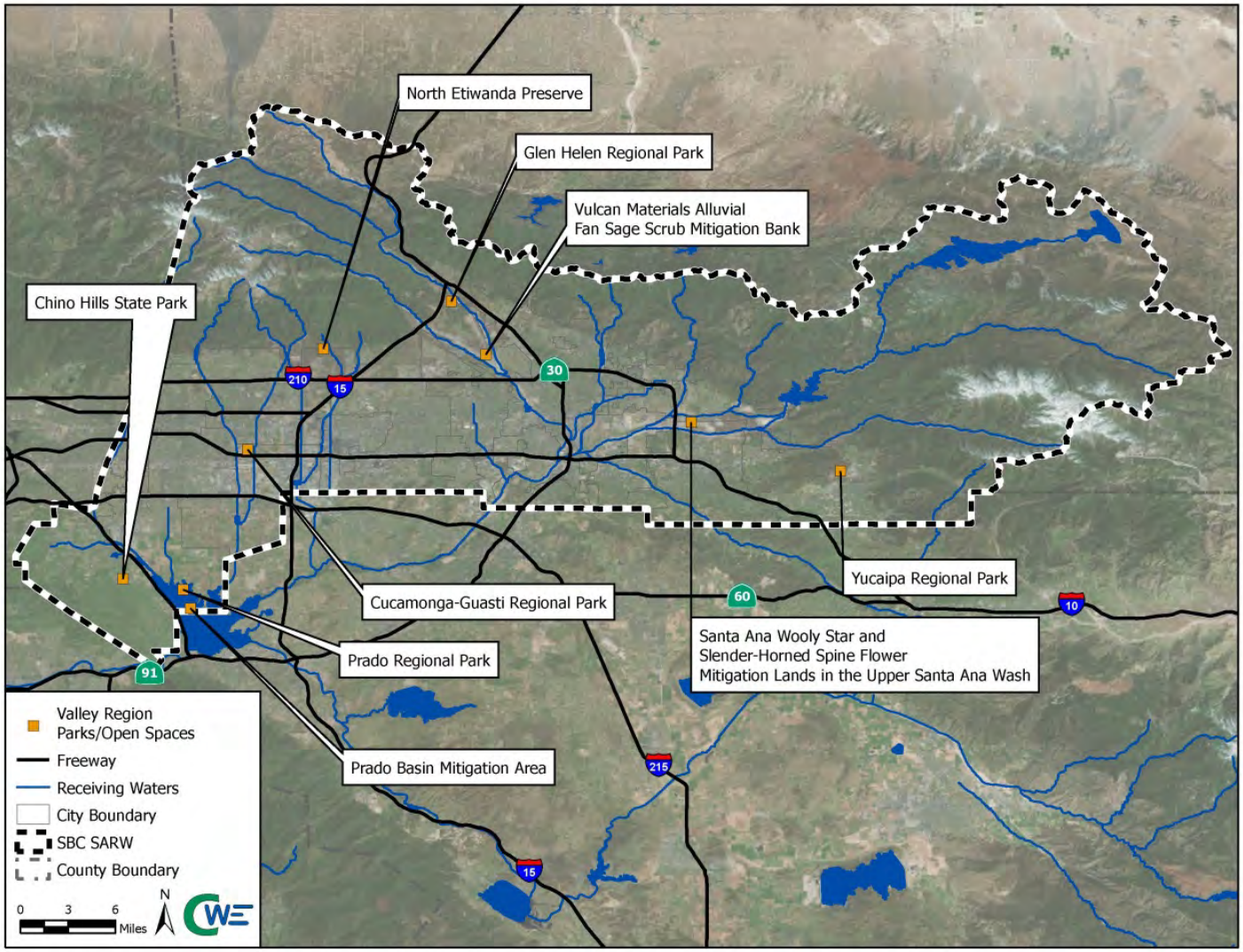


Figure 2-9 Native Habitats, Parks, and Open Space within the SBC SARW Valley Region

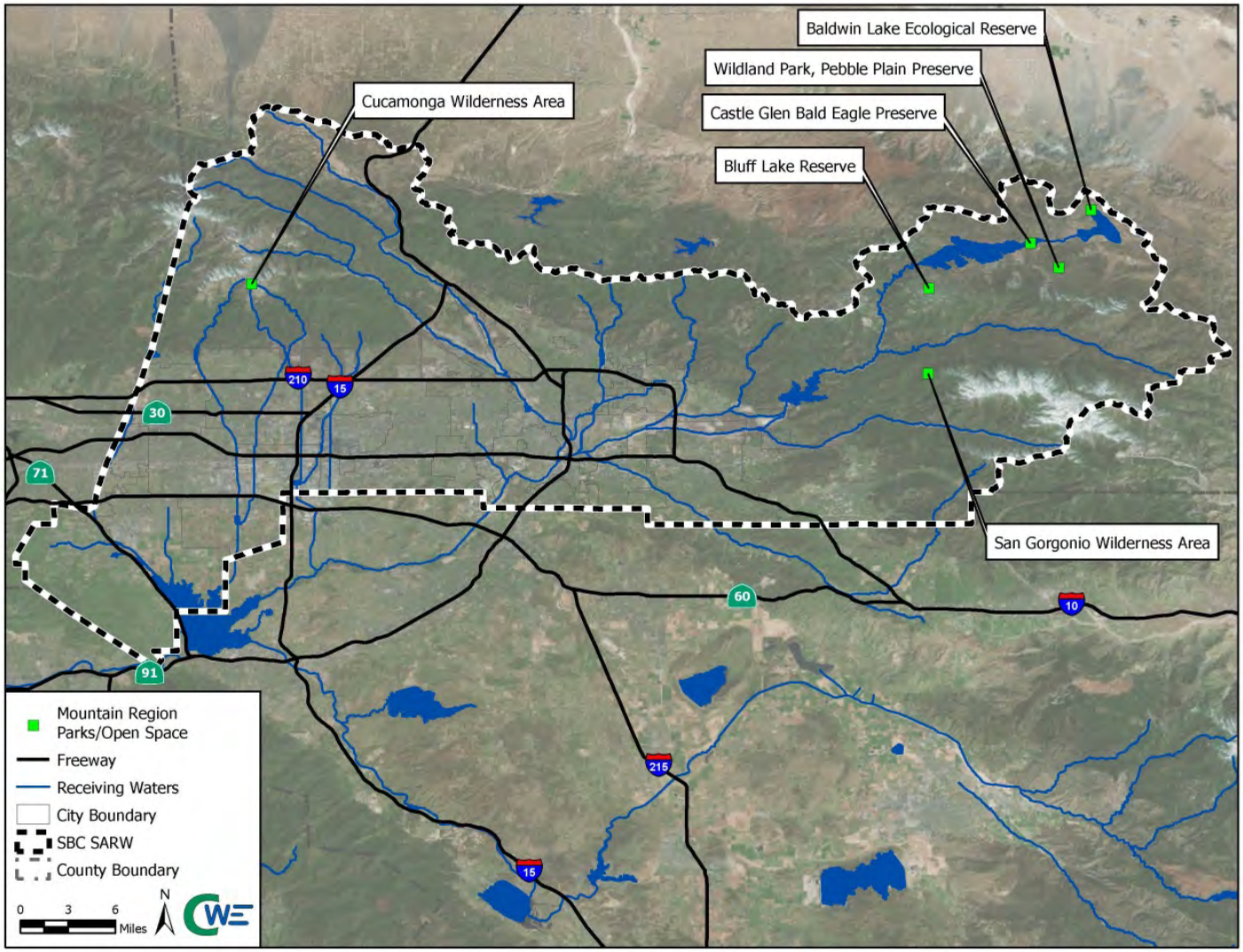


Figure 2-10 Native Habitats, Parks, and Open Space within the SBC SARW Mountain Region

2.1.4 Natural Watershed Processes

Before human activity created developed land in the San Bernardino Valley, water quality in receiving waters was maintained through natural watershed processes. The specific processes varied spatially and temporally because of the semi-arid climate and the seasonal distribution of rainfall. Processes involving the movement of sediment and the interface between surface water and groundwater were prevalent within natural stream channels. Permanent wetlands were not common within San Bernardino County, where the Santa Ana River and its tributaries only flowed during storm events. Outside of natural stream channels, the watershed processes of overland flow, groundwater recharge, interflow, and evapotranspiration dominated.

Pre-development water quality in the San Bernardino Valley was maintained through biological and chemical processes that were transient in nature due to the temporary nature of flows. The vast open scrublands and grasslands soaked up rainfall from high-frequency low-runoff storm events. Stormwater runoff from larger storms would drain in an uncontrolled manner to the channels, scouring and depositing sediments as it flowed downstream and creating habitat for native species.

San Bernardino Valley became more and more developed over time. Lands that had previously been able to absorb rain from most storms were paved over so that runoff was directed into engineered stormwater channels. Channels were dammed and diverted, thus eliminating the watershed's ability to dissipate energy through natural sedimentation and deposition.

The sections below provide in more detail an identification of the natural watershed processes that occur within the SBC SARW and a description of how they have been disrupted over time. The processes identified include overland flow, groundwater recharge, interflow, evapotranspiration, sedimentation, and chemical and biological transformation. The SBC SARW SWRP seeks to restore some of these identified natural watershed processes as a way of achieving the stormwater management objectives of the SBC SARW.

The processes identified below are described qualitatively rather than quantitatively. Most natural watershed processes described below are difficult to define quantitatively because they represent different flow paths of stormwater other than what can be measured with flow meters in channels. The task becomes even more difficult when comparing present natural watershed processes to natural watershed processes from the past, where no possibility exists for monitoring of flow processes. However, the processes can be qualitatively described, and in most cases urban development has led to the incidental impairment of natural watershed processes.

2.1.4.1 Overland Flow

Precipitation reaching the ground surface that does not immediately infiltrate runs off as overland flow. Most uncompacted vegetated soils have infiltration capacities of one to several inches per hour at the ground surface, which exceeds the rainfall intensity of even unusually intense storms. In contrast, pavement and hard surfaces reduce the effective infiltration capacity of the ground surface to zero, ensuring overland flow regardless of the meteorological attributes of a storm.

Most precipitation that fell to earth in the SARW prior to development either became groundwater or evaporated. The predominant hydrologic soil group in the San Bernardino Valley is type A, typified by low overland flow rates and high infiltration rates. The inverse is true in the mountainous regions of the

SARW where the hydrologic soil group is most commonly type D, featuring high potential for overland flow and stormwater runoff into canyons and valleys. The overland flow in mountainous regions has largely remained unchanged with time, but the overland flow in the San Bernardino Valley has increased with increasing urban development.

2.1.4.2 Groundwater Recharge and Infiltration

Groundwater recharge and infiltration are closely-linked hydrologic processes that are dominant across much of California's intact landscapes. Infiltration of rainfall into the soil prior to development was widespread on virtually any geologic material and on all but the steepest slopes. Urbanization covered the land with more impervious surfaces and reduced the watershed's natural ability to improve water quality through infiltration.

The effect of urbanization has also had an effect on the natural stream channels of the SBC SARW. The capacity of streams and riverbeds to recharge the underground aquifers decreased as urbanization occurred. Many tributaries within the SBC SARW were diverted, channelized, and paved over with concrete. **Figure 2-11** shows how streambed infiltration from four channels from within IEUA's service area that travel from the San Gabriel Mountains to the Santa Ana River has been sharply reduced over time. **Figure 2-11** was created using groundwater model data from the Chino Basin Watermaster and was included in IEUA's 2016 Chino Basin Stormwater Resource Plan. Additional studies would be necessary to evaluate additional streams, which are not included as part of this SWRP.

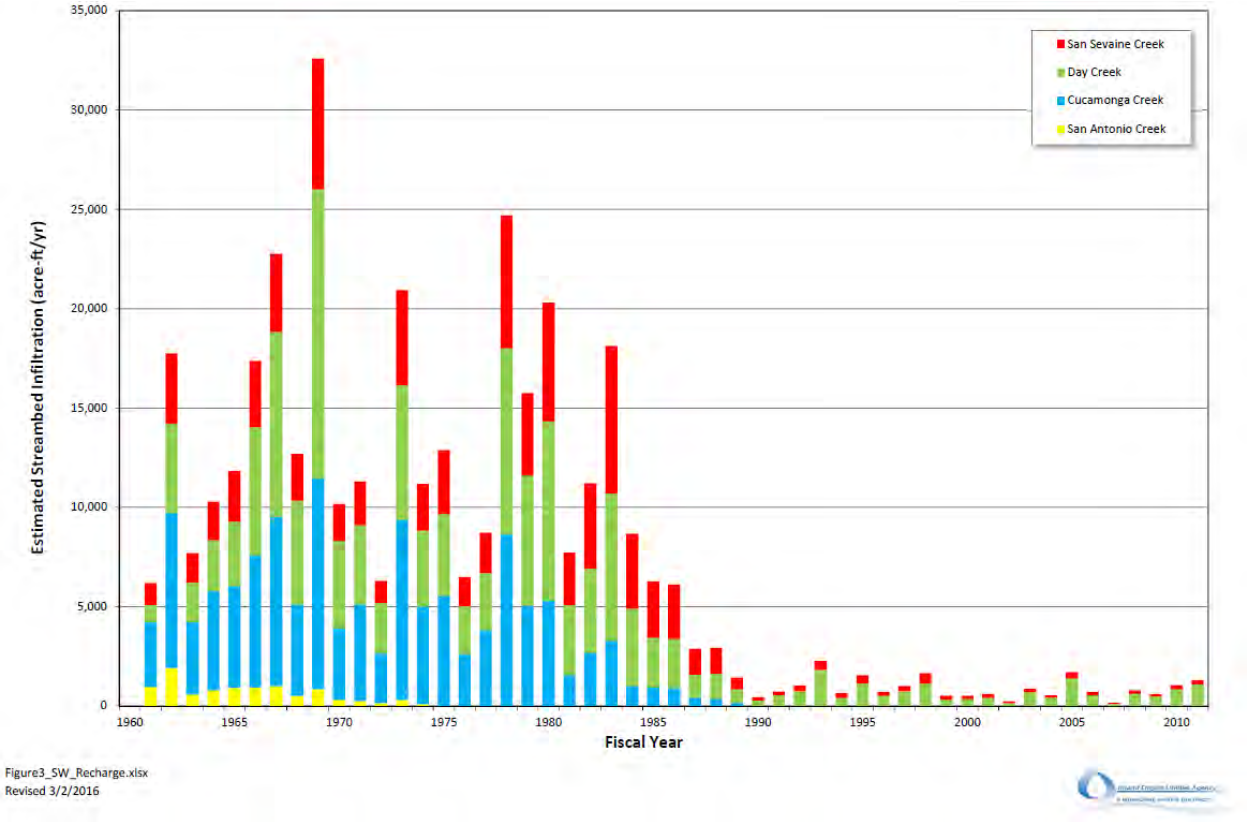


Figure 2-11 Groundwater Recharge from Streambeds (from 2016 Chino Basin SWRP)

2.1.4.3 Interflow

Interflow takes place following storm events as shallow subsurface flow (usually within three to six feet of the surface) occurring in a more permeable soil layer above a less permeable substrate. During a rainfall event, some of the water leaves the area as surface runoff, and some infiltrates to a shallow subsurface soil layer. If the shallow layer is more permeable than the layers underneath, water will tend to flow laterally underground rather than percolate to deeper soil layers. This lateral movement of shallow groundwater is interflow. The process of interflow can flatten and elongate the hydrograph of a watershed in certain locations, which can reduce velocities and flood flow rates during a storm. The magnitude of the effect can be quite pronounced in some geologic settings but small to negligible in others.

Urban development reduces infiltration and thus interflow, as well as reducing the footprint of the area supporting interflow volume. Larger acreages of impervious area along with development of underground storm drains and the paving and straightening of open drainage channels have reduced the capacity for vadose zone movements of water. As the SBC SARW has continued to develop, more precipitation that centuries ago would have become interflow and groundwater have now become overland flow and surface runoff.

2.1.4.4 Evapotranspiration

In undisturbed humid-region watersheds, the process of returning water to the atmosphere by direct evaporation from soil and vegetation surfaces, and by the active transpiration by plants, can account for nearly one-half of the total annual water balance. This fraction can be even higher in more arid regions. While evaporation is related to characteristics of meteorology such as heat, humidity, and wind, transpiration is related to plant types and the amount of moisture in the soil. Native plants are often replaced with turf, which requires additional irrigated water, especially throughout the summer months.

Though the capacity of the atmosphere to reduce the volume of standing water through evapotranspiration has remained relatively unchanged over time, evapotranspiration throughout the SBC SARW has likely increased due to land development and the introduction of non-native plant species. Non-native plant species tend to use more water and be less tolerant of droughts. The introduction of plant species that require more water has likely removed a higher volume of water from the soil column than in pre-development times.

2.1.4.5 Sedimentation

Sediment delivery into the channel network is a critical process for the maintenance of various habitat features in fluvial systems, including in the SBC SARW. Endangered species adapted to a particular natural sedimentation process. Continued development of the SBC SARW has changed this natural process.

Urban development has led to a measurable decrease in sediment flows in the Santa Ana River over time. **Figure 2-12**, from Warrick and Rubin (2007), shows how suspended sediment concentrations, while still related to total stormwater discharge in the Santa Ana River, decreased over time between 1967 and 2001.

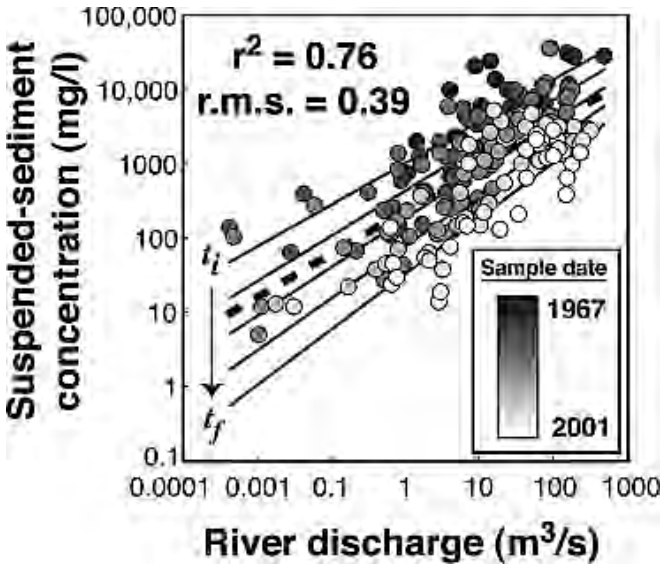


Figure 2-12 Suspended Sediment Concentration in the Santa Ana River Over Time

Delivery of both organic and inorganic sediment to the Santa Ana River tributaries upstream of Prado Dam has been disrupted by the decrease in erodible land through development, and by the addition of debris basins and groundwater recharge basins in the tributaries of the SBC SARW.

2.1.4.6 Chemical and Biological Transformation

Chemical and biological transformation encompasses the suite of watershed processes that alter the chemical composition of water as it passes through the soil column on its path to, and following entry into, a receiving water. The conversion of subsurface flow to overland flow in a developed landscape eliminates much of the opportunity for attenuation and transformations within the soil column, and this is commonly expressed as degraded water quality. The dependency of these processes on watershed conditions is complex in detail, but in general, a greater residence time of stormwater in the soil is correlated with greater activity for this group of processes.

The residence time of stormwater within the soil has decreased within the SBC SARW when compared to historic conditions. The urbanization of the watershed has led to more impervious area preventing stormwater infiltration, thereby disrupting chemical and biological transformation processes. Storm drains and concrete lined channels have further reduced the watershed's natural ability to treat stormwater through chemical and biological processes.

2.2 San Bernardino County Santa Ana River Subwatersheds

The SBC SARW is comprised of 14 subwatersheds as shown in **Figure 2-13**. The subwatersheds are associated with major tributaries to the Santa Ana River within the SBC SARW area. **Table 2-6** shows the percentage of each subwatershed within the SBC SARW by acreage. The largest subwatershed is the Santa Ana River subwatershed, which makes up just over 35 percent of the SBC SARW area. The Santa Ana River subwatersheds represent areas that are directly tributary to the river. The smallest subwatershed is Little San Gorgonio Creek which covers less than one percent of the SBC SARW area. The subwatershed water quality and characteristics were considered as part of the project quantification and may be used to prioritize future implementation, as discussed in **Section 7**. These subwatersheds

are appropriate for use in assessing projects/programs that manage stormwater and provide multiple benefits.

Table 2-6 Summary of Subwatershed Percentages within the SBC SARW

Subwatershed	Area (Acres)	Percent (%)
BBL	46,104	7.1
Cucamonga Channel	66,486	10.2
Cypress Channel	5,670	0.9
Day Creek Channel	12,931	2.0
Little San Gorgonio Creek	5,005	0.8
Lytle-Cajon Creek Channel	111,867	17.2
Mill Creek	34,758	5.4
Rialto Channel	12,180	1.9
San Antonio Channel	27,505	4.2
San Sevaine Channel	42,108	6.5
San Timoteo Creek	34,014	5.2
Santa Ana River	198,144	30.5
Upper San Antonio Channel	11,147	1.7
Warm Channel	41,594	6.4
Total:	**649,513**	**100.0**

The SBC SARW is composed of 16 cities and the UA of SBC, as mentioned in **Section 2.1.1.1**. **Table 2-7** provides a breakdown of the corresponding jurisdictions within each subwatershed. The Santa Ana River subwatershed includes 12 jurisdictions, the largest number of jurisdictions among the subwatersheds. Upper San Antonio subwatershed is composed of the least with just the UA of SBC within the subwatershed area.

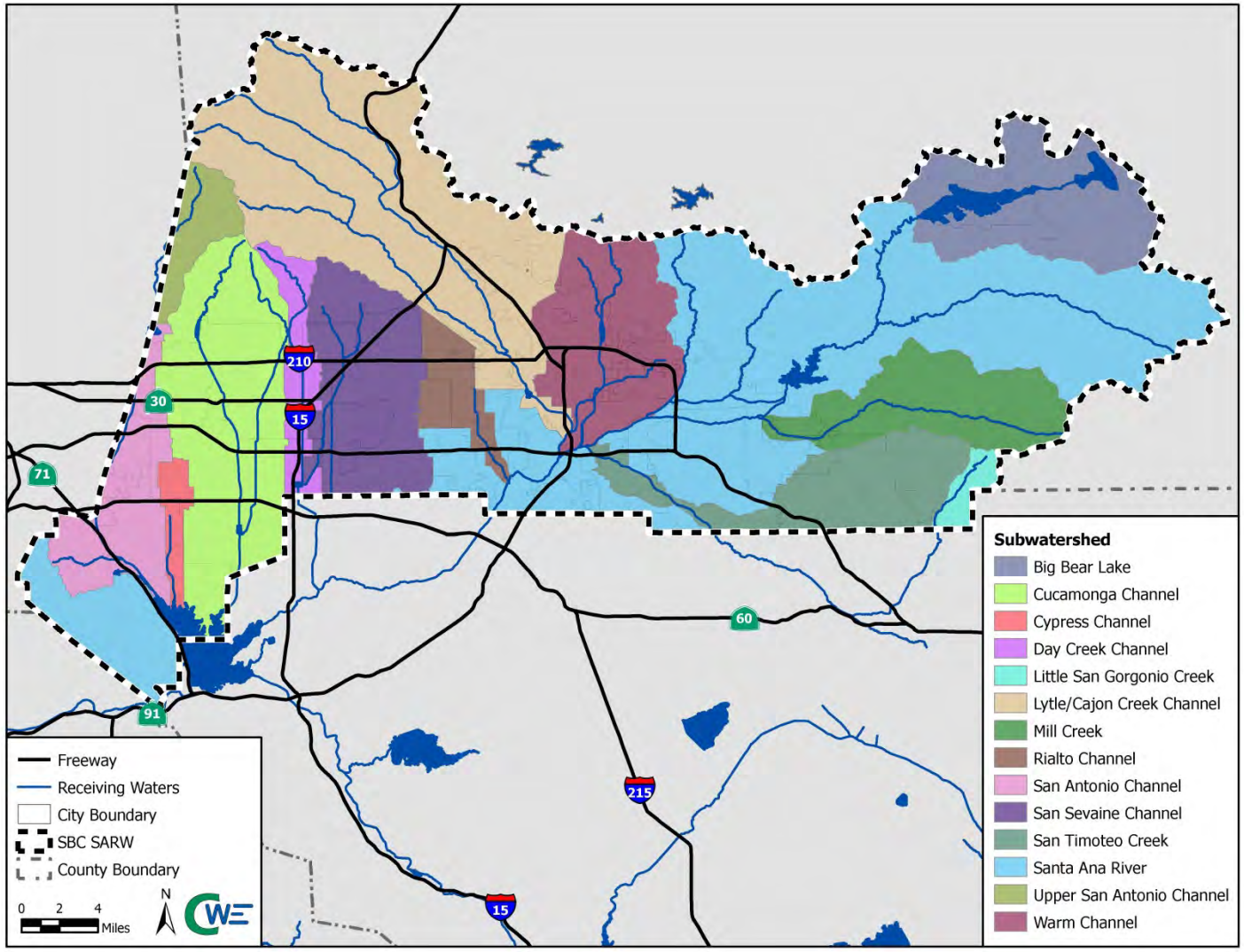


Figure 2-13 SBC SARW Subwatersheds

Table 2-7 Jurisdictional Areas within SBC SARW Subwatersheds

Jurisdictions	Subwatersheds													
	BBL	Cucamonga Channel	Cypress Channel	Day Creek Channel	Little San Gorgonio Creek	Lytle-Cajon Creek Channel	Mill Creek	Rialto Channel	San Antonio Channel	San Sevaine Channel	San Timoteo Creek	Santa Ana River	Upper San Antonio Channel	Warm Channel
BBL	X													
Chino		X	X						X			X		
Chino Hills		X							X			X		
Colton						X		X				X		X
Fontana						X		X		X		X		
Grand Terrace												X		
Highland							X					X		X
Loma Linda											X	X		
Montclair									X					
Ontario		X	X	X					X	X				
Rancho Cucamonga		X		X						X				
Redlands							X				X	X		X
Rialto						X		X		X		X		
San Bernardino						X					X	X		X
Upland		X							X					
Yucaipa					X		X				X	X		
UA SBC	X	X		X	X	X	X	X	X	X	X	X	X	X

Similarly, land use categories associated with each subwatershed are presented in **Table 2-8**. Land use categories vary from subwatershed to subwatershed, and similar to the whole of the SBC SARW, the residential and vacant land use categories have the largest area for all of the 14 subwatersheds (six subwatersheds have residential as the largest category and eight have vacant). **Attachment C** includes several figures depicting the jurisdictional boundaries, land use categories, and water storage facilities (basins) within each of the 14 subwatersheds.

Table 2-8 Land Use Composition within SBC SARW Subwatersheds

Subwatershed	Land Use Category (%)						
	Agriculture	Commercial	Education	Industrial	Residential	Transportation	Vacant
BBL	0.0	3.7	0.0	0.1	25.0	0.0	71.2
Cucamonga Channel	1.0	10.9	2.0	12.7	41.0	3.5	28.9
Cypress Channel	2.2	4.8	2.1	15.6	58.5	1.2	15.6
Day Creek Channel	0.0	7.8	1.0	24.7	18.0	3.4	45.1
Little San Gorgonio Creek	0.0	0.1	0.0	0.0	40.0	0.0	59.9
Lytle-Cajon Creek Channel	0.0	4.4	0.5	3.5	12.9	0.5	78.2
Mill Creek	0.0	1.4	<0.1	0.0	5.2	0.0	93.4
Rialto Channel	0.0	23.4	2.6	19.6	50.2	0.1	4.1
San Antonio Channel	1.6	14.5	2.7	14.9	46.3	2.5	17.5
San Sevaine Channel	0.0	8.8	2.2	21.7	38.2	2.6	26.5
San Timoteo Creek	1.0	11.3	1.0	0.4	45.4	0.4	40.5
Santa Ana River	3.8	5.3	0.6	3.8	16.8	0.6	69.1
Upper San Antonio Channel	0.0	0.5	0.0	0.0	0.0	0.0	99.5
Warm Channel	0.0	12.6	2.0	5.5	39.6	4.4	35.9

3. Water Quality Priorities

The SARWQCB Basin Plan contains the region's water quality regulations and implementation programs designed to preserve and enhance water quality and protect the beneficial uses of waters within the region. Specifically, the Basin Plan:

1. Identifies beneficial uses for surface and ground waters;
2. Includes the narrative and numerical WQOs that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy; and
3. Describes implementation programs and other actions that are necessary to achieve the WQOs established in the Basin Plan.

In combination, beneficial uses and their corresponding WQOs are called Water Quality Standards. A beneficial use is one of the various ways that water can be used for the benefit of people and/or wildlife. A water body is placed on the CWA 303(d) impaired waters list due to exceedances of Basin Plan WQOs of the beneficial uses for that water body. If the pollutant is identified to be causing the impairment, then the water body is assigned a priority for the development of a TMDL, based on the severity of the pollution and the sensitivity of the uses to be made of the waters.

Existing TMDLs and impaired water bodies identified in the 2016 Clean Water Act Section 303(d) List Integrated Report (2016 CWA 303(d) List) were considered as water quality priorities within the SBC SARW which are further discussed in **Section 3.1** to **Section 3.3**. Monitoring data from the Areawide Program was compared to applicable WQOs for each of the receiving waters to further identify priority pollutants in **Section 3.4**. Water quality data from the Areawide Program was also used to establish baseline water quality conditions in the SARW area. The identified priority pollutants from monitoring data, along with TMDL and 303(d) listed impairments, is one aspect that guides the implementation efforts for quantification and prioritization of potential multi-benefit stormwater management projects discussed in **Section 6.1**.

3.1 Existing Surface Water Impairments

The Basin Plan identifies beneficial uses for the Santa Ana River and associated tributaries within the SBC SARW. Water bodies within the SBC SARW support beneficial uses such as:

- Municipal and domestic water supply (MUN)
- Agricultural supply (AGR)
- Groundwater recharge (GWR)
- Hydropower generation (POW)
- Water contact and non-contact recreation (REC1 and REC2)
- Warm freshwater habitat (WARM)
- Cold freshwater habitat (COLD)
- Wildlife habitat (WILD)

- Rare, threatened, or endangered species (RARE)
- Spawning, reproduction, and development (SPWN)

Table 3-1 presents the beneficial uses of the Santa Ana River Reaches within the SBC SARW (illustrated in **Figure 2-1**). Narrative and numerical WQOs are set within the Basin Plan to protect the designated beneficial uses and conform to the State's Anti-Degradation Policy. In addition to the WQOs in the Basin Plan, the California Toxics Rule (CTR) is often referenced as a source of water quality assessment criteria to identify water body impairments, especially those developed through the Federal CWA 303(d) listing process (Federal Register, 2000).

Table 3-1 Santa Ana River Reach 6 through 3 Beneficial Uses

Reach	MUN	AGR	GWR	POW	REC1	REC2	WARM	COLD	WILD	RARE	SPWN
6	X	X	X	X	X	X		X	X		X
5	X*	X	X		X[1]	X	X		X	X	
4	+		X		X[1]	X	X		X	X	X
3	+	X	X		X	X	X		X	X	X

X Existing or Potential Beneficial Use
+ Excepted from MUN
* **MUN** applies upstream of Orange Avenue (Redlands); downstream, water is excepted from MUN
[1] Access prohibited in some portions per agency with jurisdiction

The following sections describe the relevant CWA 303(d) List impaired water bodies and TMDLs within the SBC SARW. Impairments of the beneficial uses identified above exist in nine water bodies, as described in **Section 3.1.1**. TMDLs have been developed for BBL for Noxious Aquatic Plants Nutrients and Middle Santa Ana River (MSAR) for Indicator Bacteria as further discussed in **Section 3.1.2**. Water quality priorities within the SBC SARW are based on the TMDL listings, while considering the impaired water bodies identified in the 2016 CWA 303(d) List.

3.1.1 CWA 303(d) List

The CWA required the State of California to prepare, and then periodically update, a list of impaired water bodies, including those pollutants or conditions causing the impairment and supporting information such as assessment criteria. The current 2016 CWA 303(d) List of water body impairments within the SBC SARW are presented in **Table 3-2** and **Figure 3-1** (SWRCB, 2017a).

On April 28, 2017, the SARWQCB adopted Order No. R8-2017-0013, *Approval of Recommendations for the Federal Clean Water Act Section 303(d) List* (2016 CWA 303(d) List) (SARWQCB, 2017). The SWRCB evaluated the data submitted as part of Order No. R8-2017-0013, for completeness and consistency with the *Water Quality Control Policy for Developing California's CWA Section 303(d) List* (Listing Policy) (SWRCB, 2004). On June 9, 2017, the SWRCB issued the draft *2014 and 2016 California Integrated Report Clean Water Act Sections 303(d) and 305(b)* (2014 and 2016 Integrated Report) outlining the findings from the SWRCB's assessment and recommendations for new listing and delisting to the CWA 303(d) List (SWRCB, 2017a). The 2014 and 2016 Integrated Report recommended delisting a number of water body-pollutant combinations noted in the 2016 CWA 303(d) List. New listing and delisting per the 2016 CWA 303(d) List and SWRCB 2014 and 2016 Integrated Report are noted in **Table 3-2**. The 2016 list obtained final approval from the Office of Administrative Law (OAL) and the USEPA on April 6, 2018, and was utilized in water quality data analysis in **Section 3.3**.

Table 3-2 2016 CWA 303(d) List of Impairments within SBC SARW

Water Body	2016 CWA 303(d) List of Impairments
BBL	Mercury, PCBs, Noxious (Nuisance) Aquatic Plants, Nutrients, Chlordane, DDT (Dichlorodiphenyltrichloroethane)
Chino Creek Reach 1A	Nutrients, Indicator Bacteria
Chino Creek Reach 1B	COD, Nutrients, Indicator Bacteria
Chino Creek Reach 2	pH, Indicator Bacteria
Cucamonga Creek Reach 1	Cadmium, Copper, Lead, Zinc, Indicator Bacteria
Cucamonga Creek Reach 2	pH
Grout Creek	Nutrients
Knickerbocker Creek	Indicator Bacteria
Lytle Creek	None
Mill Creek (Prado Area)	Nutrients, Indicator Bacteria, TSS
Mill Creek Reach 1	Indicator Bacteria
Mill Creek Reach 2	None
Mountain Home Creek	Indicator Bacteria
Mountain Home Creek, East Fork	Indicator Bacteria
Prado Park Lake	Nutrients, Indicator Bacteria
Prado Flood Control Basin	pH
Rathbone (Rathbun) Creek	Cadmium, Copper, Nutrients, Sedimentation/Siltation
San Antonio Creek	pH
Santa Ana River Reach 3	Copper, Lead, Indicator Bacteria
Santa Ana River Reach 4	Indicator Bacteria
Santa Ana River Reach 6	Cadmium, Copper, Lead
Summit Creek	Nutrients

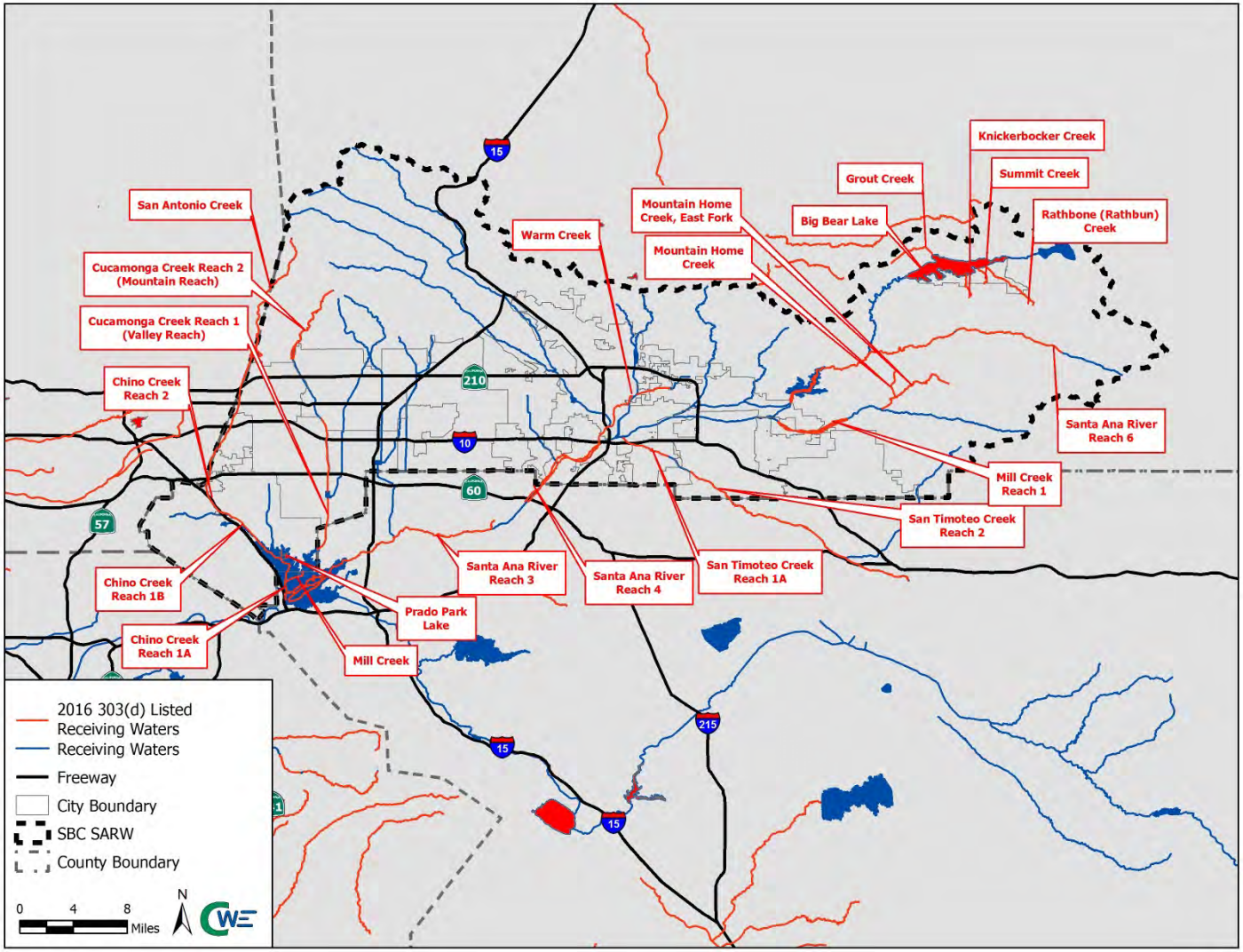


Figure 3-1 2016 CWA 303(d) List of Impaired Water Bodies within SBC SARW

3.1.2 Total Maximum Daily Loads

A TMDL must be developed for water bodies placed on the CWA 303(d) List. For water bodies needing a TMDL or alternative planning tool, a completion schedule is developed by the SARWQCB as outlined in the Listing Policy (SWRCB, 2017a). A TMDL defines how much of a pollutant can be present in a water body and still meet water quality standards and protect beneficial uses. Each TMDL must account for contributions from point and non-point sources and provide a Waste Load Allocation (WLA) and Load Allocation (LA), respectively. **Table 3-3** lists two applicable TMDLs in the SBC SARW and subsections below present additional details regarding these TMDLs.

Table 3-3 TMDLs Developed within the SBC SARW

Water Body(ies)	TMDL
BBL	Nutrients and Nuisance Aquatic Plants
MSAR – Chino Creek Reach 1, Chino Creek Reach 2, Cucamonga Creek Reach 1, Mill Creek (Prado Area), Prado Park Lake, Santa Ana River Reach 3	Indicator Bacteria

3.1.2.1 Big Bear Lake Nutrients and Nuisance Aquatic Plants TMDL

Proliferation of nuisance (also referred to as noxious) aquatic plants has been recorded in BBL since the 1970s and nutrient discharges have helped promote the growth of nuisance aquatic plants. These nuisance aquatic plants serve as both a sink and source of nutrients. BBL's designated beneficial uses impacted by low dissolved oxygen levels, caused by excess nutrients and nuisance aquatic plants, include COLD, REC1, REC2, WARM, WILD, and RARE. As a result, BBL is on the CWA 303(d) List and a TMDL was developed to limit nutrient loading. The Big Bear Lake Nutrient (BBLN) TMDL was adopted by the SARWQCB in April 2006, and approved by the USEPA on September 25, 2007. The BBLN TMDL numeric targets are shown in **Table 3-4** (SARWQCB, 2006). BBLN TMDL numeric targets during dry hydrologic conditions are required as of 2015 and all other conditions by 2020. In addition, BBLN TMDL WLA and LA established for total phosphorus during dry hydrological conditions are presented in **Table 3-5** (SARWQCB, 2006).

Table 3-4 Big Bear Lake Nutrient TMDL Numeric Targets

Parameter	Target Values	Compliance Date[a]	
		Interim – Dry Hydro Conditions	Final – All Other Conditions
Total Phosphorus	35 µg/L (annual average[b])	2015	2020[c]
Macrophyte Coverage	30-40% on a total lake area basis		2020[c,d]
Percentage of Nuisance Aquatic Vascular Plant Species	95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species		2020[c,d]
Chlorophyll *a*	14 µg/L (growing season[e] average)		2020[c]

[a] Compliance with the targets to be achieved as soon as possible, but no later than the date specified.
[b] Annual average determined by the following methodology: the nutrient data from both the photic composite and discrete bottom samples are averaged by station number and month; a calendar year average is obtained for each sampling location by averaging the average of each month; and finally, the separate annual averages for each location are averaged to determine the lake-wide average.
[c] Compliance date for wet and/or average hydrological conditions may change in response to approved TMDLs for wet/average hydrological conditions.
[d] Calculated as a 5-year running average based on measurements taken at peak macrophyte growth as determined in the Aquatic Plant Management Plan.
[e] Growing season is the period from May 1 through October 31 of each year. The chlorophyll *a* data from the photic samples are averaged by station number and month; a growing season average is obtained for each sampling location by averaging the average of each month; and finally, the separate growing season averages for each location are averaged to determine the lake-wide average.

Table 3-5 Phosphorus WLAs and LAs for Dry Hydrological Conditions

Big Bear Lake Nutrient TMDL for Dry Hydrological Conditions	Total Phosphorus Load Allocation (lbs/yr)[a,b]
WLA	**475**
Urban	475
LA	**25,537**
Internal Sediment	8,555
Internal macrophyte	15,700
Atmospheric Deposition	1,074
Forest	175
Resort	33
TMDL	**26,012**

[a] Allocation compliance to be achieved as soon as possible, but no later than December 31, 2015.
[b] Specified as an annual average for dry hydrological conditions only.

3.1.2.2 Middle Santa Ana River Bacterial Indicator TMDL

Water bodies within the MSAR Watershed portion of the SBC SARW, in the MSAR Bacterial Indicator TMDL were identified as follows (SARWQCB, 2005c):

- Chino Creek, Reach 1
- Chino Creek, Reach 2

- Cucamonga Creek, Reach 1
- Mill Creek (Prado Area)
- Prado Park Lake
- Santa Ana River, Reach 3

Elevated fecal coliform densities adversely affecting REC1 designated beneficial uses were identified within the MSAR water bodies. As a result, the MSAR water bodies were placed on the CWA 303(d) List and a TMDL was developed to address the impairment. The MSAR Bacterial Indicator TMDL was adopted by the SARWQCB on August 26, 2005, and approved by the USEPA on May 16, 2007 (SARWQCB, 2005c). The MSAR Bacterial Indicator TMDL establishes WLAs, LAs, and compliance targets for fecal coliform and *E. coli* during the wet and dry season. **Table 3-6** identifies the MSAR Bacterial Indicator WLAs, LAs, and TMDL requirements applicable to the SBC SARW area. It is important to note that the targets identified in the table below are associated with the original TMDL requirements. The Basin Plan WQO for *E. coli* (126 organisms/100 milliliters for a 5-day/30-day geomean) is used to assess compliance based on the discussion below.

Table 3-6 TMDLs, WLAs, and LAs for Bacterial Indicators in MSAR Water Bodies

Indicator	Original Compliance Target[a,b,c]
Fecal coliform	5-sample/30-day Logarithmic Mean less than 180 organisms/100mL, and not more than 10% of the samples exceed 360 organisms/100mL for any 30-day period.
E. coli	5-sample/30-day Logarithmic Mean less than 113 organisms/100mL, and not more than 10% of the samples exceed 212 organisms/100mL for any 30-day period.

[a] To be achieved as soon as possible, but no later than December 31, 2015, for both dry summer and wet winter conditions.

[b] Compliance target include a 10% margin of safety.

[c] The fecal coliform compliance target has become ineffective upon the replacement of the REC1 fecal coliform objectives in the Basin Plan by approved REC1 objectives based on *E. coli*. SARWQCB Resolution: R8-2012-0001, June 15, 2012 (SARWQCB, 2012b).

On June 15, 2012, the SARWQCB adopted the Basin Plan Amendment (BPA) Resolution R8-2012-0001, to Revise Recreation Standards for Inland Freshwaters in the Santa Ana Region (SARWQCB, 2012b). This BPA resulted in the following key modifications to the Basin Plan:

- Addition of "Primary Contact Recreation" as an alternative name for the REC1 (water contact recreation) beneficial use;
- Addition of narrative text clarifying the nature of REC1 activities and the bacteria objectives established to protect these activities;
- Differentiation of inland surface REC1 waters on the basis of frequency of use and other characteristics for the purposes of assigning applicable single sample maximum values;
- Revision of REC1/REC2 (non-contact water recreation) designations for specific inland surface waters based on the results of completed Use Attainability Analyses (UAA) (SARWQCB, 2012a and 2013);
- Revised water quality objectives to protect the REC1 use of inland freshwaters; and

- Identification of criteria for temporary suspension of recreation use designations and objectives (high flow suspension).

The BPA Resolution R8-2012-0001 was approved by the SWRCB on January 21, 2014, and the OAL on July 2, 2014. The USEPA issued its letter of approval/disapproval on April 8, 2015, and provided a letter of clarification on August 3, 2015. Upon USEPA approval of the BPA Resolution R8-2012-0001 the compliance target for fecal coliform, as indicated in **Table 3-6**, is ineffective, as *E. coli* is the only compliance target for bacterial indicators.

3.1.3 Trash Amendments

Trash generated by human activities frequently end up in waterways. The presence of trash in waterways adversely affects beneficial uses and threatens aquatic life, wildlife, and public health. On April 7, 2015, the SWRCB adopted Resolution No. 2015-0019 which approved *Amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) to Control Trash* and *Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries* (ISWEBE Plan), collectively referred to as the Trash Amendments (2015a). The USEPA approved the Trash Amendments on January 12, 2016, which applies to all surface waters within the State of California, except waters within the jurisdiction of the Los Angeles Region where trash or debris TMDLs are in effect prior to the effective date of the Trash Amendments. The narrative WQO for the Trash Amendments are as follows:

- For the Ocean Plan: Trash shall not be present in ocean waters, along shorelines or adjacent areas in amounts that adversely affect beneficial uses or cause nuisance.
- For the ISWEBE Plan: Trash shall not be present in inland surface waters, enclosed bays, estuaries, and along shorelines or adjacent areas in amounts that adversely affect beneficial uses or cause nuisance.

The Trash Amendments requirements are to be incorporated into Phase I and II MS4 Permits, Industrial General Permit (IGP), Construction General Permit (CGP), and the California Department of Transportation (Caltrans) NPDES Permit. NPDES Permittees with regulatory authority over land uses are to prohibit the discharge of trash under a dual alternative compliance approach or "Tracks" through the implementation defined by either Track 1 or Track 2. Both Tracks require Permittees to focus their trash control efforts on priority land uses, as outlined in **Table 3-7**. The priority land uses are defined as developed land uses that are high density residential, industrial, commercial, mixed urban, and public transportation stations.

Table 3-7 Overview of Proposed Compliance Tracks for NPDES Stormwater Permits

Element	Track 1	Track 2
NPDES Stormwater Permit	Phase I and II MS4 IGP/CGP[a]	Phase I and II MS4 Caltrans IGP/CGP[a]
Plan of Implementation	Install, operate, and maintain Full Capture Systems (FCSs) in storm drains that capture runoff from one or more of the priority land uses/facility/site.	Implement a plan with a combination of FCSs, multi-benefit projects, institutional controls, and/or other treatment controls to achieve FCSs equivalency.
Time Schedule	10 years from first implementing permit but no later than 15 years from the effective date of the Trash Amendments.[b]	
Monitoring and Reporting	Demonstrate installation, operation, and maintenance of FCSs and provide mapped location and drainage area served by FCSs.[c]	Develop and implement set of monitoring objectives that demonstrate effectiveness of the selected combination of controls and compliance with FCS equivalency.[c]

[a] IGP/CGP Permittees would first demonstrate inability to comply with the outright prohibition of discharge of trash.

[b] Where a permitting authority makes a determination that a specific land use or location generates a substantial amount of trash, the permitting authority has the discretion to determine a time schedule with a maximum of ten years. IGP/CGP Permittees would demonstrate full compliance with deadlines contained in the first implementing permit.

[c] No trash monitoring requirements for IGP/CGP; however, IGP/CGP Permittees would be required to report trash controls.

3.2 Existing Groundwater Quality

Groundwater accounts for a majority of the domestic water supply in the SBC SARW. Groundwater quality varies among the region's groundwater basins, as they cover a large geographic area. Various agencies throughout the SBC SARW participate in regional efforts to monitor groundwater quality. This section summarizes groundwater quality data based on past monitoring efforts.

3.2.1 Chino Groundwater Basin

The Chino Groundwater Basin (illustrated in **Figure 2-7**) comprises an area of approximately 235 square miles that extends from the Prado Basin in the southwestern corner, bounded by the Chino Hills and Puente Hills to the west, the San Jose and Red Hill Faults along the San Gabriel Mountains to the northwest, the Rialto-Colton Fault to the northeast, and the Jurupa Mountains and La Sierra Hills to the southeast. The Chino Groundwater Basin consists of five Management Zones (MZ) and four basin delineations – Chino North comprised of MZ1, MZ2, MZ3 with about 90 percent in San Bernardino County; Chino-East (MZ4); Chino-South (MZ5); Prado Basin (parts of MZ1, MZ2, MZ3, and MZ5); and MZ4 and MZ5 are in Riverside County.

The Chino Groundwater Basin is administered by the Chino Basin Watermaster (CBWM) which prepares a Maximum Benefit Annual Report (2018) and a State of the Basin Report (2017) that tabulates the findings of the monitoring effort in the Chino Groundwater Basin. The monitoring program consists of two main components: groundwater-level monitoring and groundwater-quality monitoring. Groundwater-quality is the focus of this section. The CBWM initiated a comprehensive monitoring program to perform

systematic sampling of wells. Details of the monitoring programs as of fiscal year 2015-2016 are as follows:

- **Chino Basin Data Collection –** the CBWM routinely collects groundwater quality data from well owners, municipal producers, and government agencies. Data is also collected as part of special studies and monitoring taken under orders from the RWQCB, e.g., landfills, groundwater quality investigations, Department of Toxic Substances, United State Geological Survey (USGS), and others. Data is typically collected twice a year. In 2016, data was collected for over 780 wells as part of the Chino Basin Data Collection.
- **CBWM Field Groundwater Quality Monitoring Programs –** continued sampling of privately owned wells and its own monitoring wells on a routine basis as follows:
  - **Private Wells** – approximately 109 private wells, mostly located in the southern portion of the Chino Groundwater Basin, are sampled at various frequencies depending on their proximity to known point source contamination plumes. Eighty-nine wells are sampled on a triennial basis, and 20 wells near contaminant plumes are sampled annually.
  - **CBWM Monitoring Wells** – approximately 22 multi-nested monitoring wells including nine Hydraulic Control Monitoring Program wells, nine Prado Basin Habitat Sustainability Program wells, and four wells near contaminant plumes in MZ3.
  - **Other wells** – four near-river wells, Archibald 1 and Archibald 2 (USGS), and two SAR Water Company wells (9 and 11).

Groundwater quality data is checked by CBWM staff and uploaded to a centralized database management system accessed online through HydroDaVE. The data is used to comply with two maximum benefit salinity management commitments, prepare the biennial State of the Basin Report, support groundwater modeling, characterize non-point source contamination and plumes associated with point source discharges, and characterize long-term trends in water quality.

The State of the Basin Report (2017) includes groundwater quality data for a five year period from July 2011 to June 2016. Groundwater quality is characterized with respect to constituents where groundwater exceeds Primary or Secondary California Maximum Contaminant Levels (MCLs) or Notification Levels (NLs). Wells with constituent concentrations greater than a Primary MCL represent areas of concern and the spatial distribution of these wells indicates areas in the Basin where groundwater may be impaired from a beneficial use standpoint.

The following is a list of the regulatory and voluntary groundwater quality contamination monitoring efforts in the Chino Basin that are tracked by CBWM:

- Alumax Aluminum Recycling Facility - Constituents of Concern: Total Dissolved Solids (TDS), sulfate, nitrate, chloride.
  Order: RWQCB Cleanup and Abatement Order 99-38
- Alger Manufacturing Co. - Constituents of Concern: Volatile Organic Compounds (VOCs).
  Order: Voluntary Cleanup and Monitoring
- Chino Airport - Constituents of Concern: VOCs.
  Order: RWQCB Cleanup and Abatement Order 90-134
- California Institute for Men (No Further Action status) - Constituents of Concern: VOCs.
  Order: Voluntary Cleanup and Monitoring

- Former Crown Coach International Facility - Constituents of Concern: VOCs and solvents.
  Order: Voluntary Cleanup and Monitoring
- General Electric Flatiron Facility - Constituents of Concern: VOCs and hexavalent chromium.
  Order: Voluntary Cleanup and Monitoring
- General Electric Test Cell Facility - Constituents of Concern: VOCs.
  Order: Voluntary Cleanup and Monitoring
- Former Kaiser Steel Mill - Constituents of Concern: TDS, total organic carbon (TOC), VOCs.
  Order: RWQCB Order 91-40 Closed. Kaiser granted capacity to the Chino II Desalter to remediate.
- Former Kaiser Steel Mill – CCG Property - Constituents of Concern: chromium, hexavalent chromium, other metals, VOCs.
  Order: DTSC Consent Order 00/01-001
- Milliken Sanitary Landfill - Constituents of Concern: VOCs.
  Order: RWQCB Order 81-003
- Upland Sanitary Landfill - Constituents of Concern: VOCs.
  Order: RWQCB Order No 98-99-07
- South Archibald Plume - Constituents of Concern: VOCs.
  Order: This plume is currently being voluntarily investigated by a group of potentially responsible parties per seven Draft Cleanup and Abatement Orders
- Stringfellow NPL Site - Constituents of Concern: VOCs, perchlorate, Nitrosodimethylamine (NDMA), trace metals.
  Order: The Stringfellow Site is the subject of USEPA Records of Decision: EPA/ROD/R09-84/007, EPA/ROD/R09-83/005, EPA/ROD/R09-87/016, and EPA/ROD/R09-90/048.

There were a total of 1,358 wells within the Chino Basin where water quality data was available from July 2011 to June 2016. **Table 3-8** includes a tabulation of the findings of the program for that period specified by the number of wells that exceeded the MCL for the constituents of concern. Of these, 828 wells were sampled in Fiscal Year 2016.

Table 3-8 Groundwater Quality in the Chino Groundwater Basin (CBWM, 2017)

Analyte	California MCL	No. of Wells Exceeding MCL
Primary Contaminant		
1,1,2-Trichloroethane	5 µg/L	1
1,1-Dichloroethane	5 µg/L	2
1,1-Dichloroethene (1,1-DCE)	6 µg/L	16
1,2,4-Trichlorobenzene	5 µg/L	34
1,2-Dibromo-3-chloropropane	0.2 µg/L	5
1,2-Dichlorobenzene	600 µg/L	47
1,2-Dichloroethane	0.5 µg/L	64
1,2-Dichloropropane	5 µg/L	2
1,4-Dichlorobenzene	5 µg/L	110
Aluminum	1 mg/L	94

Analyte	California MCL	No. of Wells Exceeding MCL
Antimony	6 µg/L	1
Arsenic	10 µg/L	71
Barium	1 mg/L	13
Benzene	1 µg/L	98
Beryllium	4 µg/L	21
Bromate	10 µg/L	9
Cadmium	5 µg/L	57
Carbon Tetrachloride	0.5 µg/L	12
Chlorobenzene	70 µg/L	73
Chromium (VI)	10 µg/L	91
Chromium	50 µg/L	193
cis-1,2-Dichloroethene	6 µg/L	61
Copper	1.3 mg/L	20
Cyanide	150 µg/L	2
Di(2-ethylhexyl)phthalate	4 µg/L	28
Dichloromethane (Freon 30)	5 µg/L	108
Ethylbenzene	300 µg/L	51
Fluoride	2 mg/L	53
Gross Alpha	15 pCi/L	12
Heptachlor	0.01 µg/L	1
Hepthachlor Epoxide	0.01 µg/L	2
Lead	15 µg/L	27
Mercury	2 µg/L	3
Methyl Tert-Butyl Ether (MTBE)	13 µg/L	76
Nickel	0.1 µg/L	65
Nitrate-Nitrogen	10 mg/L	606
Nitrite-Nitrogen	1 mg/L	26
Pentachlorophenol	1 µg/L	1
Perchlorate	6 µg/L	457
Ra 226 + Ra 228	5 pCi/L	1
Selenium	50 µg/L	9
Tetrachloroethene (PCE)	5 µg/L	110
Thallium	2 µg/L	7
Toluene	150 µg/L	38
Total Xylene	1750 µg/L	24
Trichloroethylene (TCE)	5 µg/L	285
Uranium	20 pCi/L	1
Vinyl Chloride	0.5 µg/L	6
Secondary Contaminant		
Aluminum	1 mg/L	121
Chloride	500 mg/L	6

Analyte	California MCL	No. of Wells Exceeding MCL
Copper	1.3 mg/L	22
Iron	0.3 mg/L	344
Manganese	50 µg/L	287
Methyl Tert-Butyl Ether (MTBE)	13 µg/L	98
Odor	3 TON	2
Specific Conductance	1600 µS/cm	120
Sulfate	250 mg/l	134
TDS	1000 MG/l	122
Turbidity	5 NTU	59
Zinc	5 mg/L	30

The CBWM defines constituents of potential concern as the following. Findings from July 2011 to June 2016 related to each constituent of concern is further discussed in the 2016 State of the Basin Report (CBWM, 2017)

- Constituents associated with salt and nutrient management planning (i.e., TDS and nitrate).
- Constituents where a primary MCL was exceeded in twenty or more wells from July 2011 to June 2016 and where the majority of wells with exceedances are not primarily exclusive to known point source contamination plumes (i.e., the Stringfellow NPL Site, Milliken Landfill, etc.). These constituents include nitrate, perchlorate, total chromium, hexavalent chromium, arsenic, TCE, and PCE.
- Constituents for which the California Division of Drinking Water is in the process of developing an MCL that may impact future beneficial uses of groundwater. This includes 1,2,3-trichloropropane (1,2,3-TCP), which currently is monitored under a NL.

3.2.2 San Bernardino Valley Municipal Water District

SBVMWD conducts a groundwater monitoring program, which is further described in this subsection. Details pertaining to the monitoring program are summarized in the Upper SARW IRWMP (SBVMWD, 2015). The approach to the groundwater monitoring program is somewhat different than in the Chino Groundwater Basin. Instead of an overall listing of contaminants and the number of wells exceeding the MCLs for any particular constituent, the SBVMWD groups the findings into separate groundwater basins with the number of wells sampled and the number of wells exceeding the respective MCL. The findings are truncated to seven water quality constituents with groupings of:

1. Inorganics (primary)
2. Radiological
3. Nitrates
4. Pesticides
5. VOCs and SOCs
6. Inorganics (secondary)
7. Perchlorate

Primary inorganics include: arsenic, barium, beryllium, borate, cadmium, chromium, copper, cyanide, flouride, lead, mercury, nickel, selenium, and thallium. Secondary inorganics include: aluminum, chlorine, iron, manganese, silver, sodium, and zinc. VOCs include benzene, carbon tetrachloride, TCE, PCE, and others.

In addition to the above listed constituents, TDS concentrations are published in a range from minimum to maximum detected with a cumulative average for each individual groundwater basin (if detected).

The SBVMWD service area groundwater basins/subbasins are adjacent to and east of the Chino Groundwater Basin. There are nine groundwater subbasins in the SBVMWD service area/upper SAR region, as illustrated in **Figure 2-7** (with the exception of those noted below, which are illustrated in the Upper SARW IRWMP [SBVMWD, 2015]):

1. San Bernardino Basin Area – Bunker Hill Subbasin
2. Rialto-Colton Subbasin
3. Cajon Subbasin
4. Riverside-Arlington Subbasin
5. San Timoteo Subbasin
6. Yucaipa Subbasin
7. Bear Valley Subbasin (located near Big Bear Lake – not illustrated in **Figure 2-7**)
8. Big Meadows Valley Subbasin (located south of Big Bear Lake – not illustrated in **Figure 2-7**)
9. Seven Oaks Valley Subbasin (located west of Big Meadows Valley – not illustrated in **Figure 2-7**)

The Bear Valley, Big Meadows Valley, and Seven Oaks Valley Subbasins are not within the SBVMWD service area but are within the Upper SAR Watershed and are reported in California's Groundwater Bulletin 118.

Table 3-9 summarizes groundwater quality data reported in the Upper SARW IRWMP (SBVMWD, 2015). Additional discussion pertaining to these result are included in the referenced report, while the table below represents a summary.

Table 3-9 Groundwater Quality Reported in the Upper SARW IRWMP (SBVMWD, 2015)

Analyte	No. Wells Sampled	No. of Wells Exceeding MCL
San Bernardino Basin Area		
Inorganics (primary)	212	13
Radiological	207	34
Nitrates	214	34
Pesticides	211	20
VOCs and SOCs	211	32
Inorganics (secondary)	212	25
Perchlorate	369	156[1]
Rialto-Colton Subbasin		
Inorganics (primary)	38	0

Analyte	No. Wells Sampled	No. of Wells Exceeding MCL
Radiological	40	0
Nitrates	38	2
Pesticides	40	0
VOCs and SOCs	40	3
Inorganics (secondary)	38	3
Perchlorate	38	7
Cajon Subbasin		
No recorded exceedances of MCL at two wells sampled		
Riverside-Arlington Subbasin		
Inorganics (primary)	48	2
Radiological	48	11
Nitrates	51	21
Pesticides	50	19
VOCs and SOCs	50	8
Inorganics (secondary)	38	3
San Timoteo Subbasin		
Only one of the 27 wells sampled had secondary inorganics exceeding the MCL		
Yucaipa Subbasin		
Inorganics (primary)	43	1
Radiological	44	1
Nitrates	46	12
Pesticides	43	4
VOCs and SOCs	44	1
Inorganics (secondary)	43	4
Bear Valley Groundwater Basin		
Inorganics (primary)	33	7
Radiological	37	0
Nitrates	32	0
Pesticides	20	0
VOCs and SOCs	31	0
Inorganics (secondary)	33	5
Big Meadows Valley Basin		
No recorded exceedances of MCL		
Seven Oaks Valley Basin		
No data available		

3.2.3 Plumes

Several plumes are identified within the SBC SARW area. **Figure 3-2** illustrates the plume locations based on GIS data available in the Watershed Action Plan Geodatabase prepared by the Areawide Program. The following plumes are detailed in the Upper SARW IRWMP (SBVMWD, 2015).

- Crafton-Redlands plume: contaminated with TCE and lower levels of PCE, debromochloropropane (DBCP), and perchlorate
- Norton Air Force Base: TCE and PCE plume, which stretches 2.5 miles from its source and contaminates 100,000 acre-feet of groundwater
- Newmark-Muscoy plume: near the Shandon Hills, which is a Superfund site with TCE and PCE
- Santa Fe plume: contaminated with PCE, TCE, and 1,2 dichloroethylene (1,2-DCE)

The Crafton-Redlands plume consists of two intermingled plumes impacting water supply wells owned by the Cities of Riverside, Redlands, and Loma Linda. One plume has TCE measured at >100 μg/L (MCL= 6 μg/L), while the other has perchlorate to 77 μg/L (MCL=4 μg/L). TCE is treated with Granular Activated Carbon (GAC) treatment units, and perchlorate is treated by ion-exchange units. The Newark-Muscoy plumes are also treated by GAC.

The Norton Air Force Base plume is a major contaminant plume consisting mainly of PCE and TCE and is treated by soil gas extraction, soil removal, and groundwater treatment (GAC and ion-exchange). The treatment units are currently on standby mode (SBVMWD, 2015).

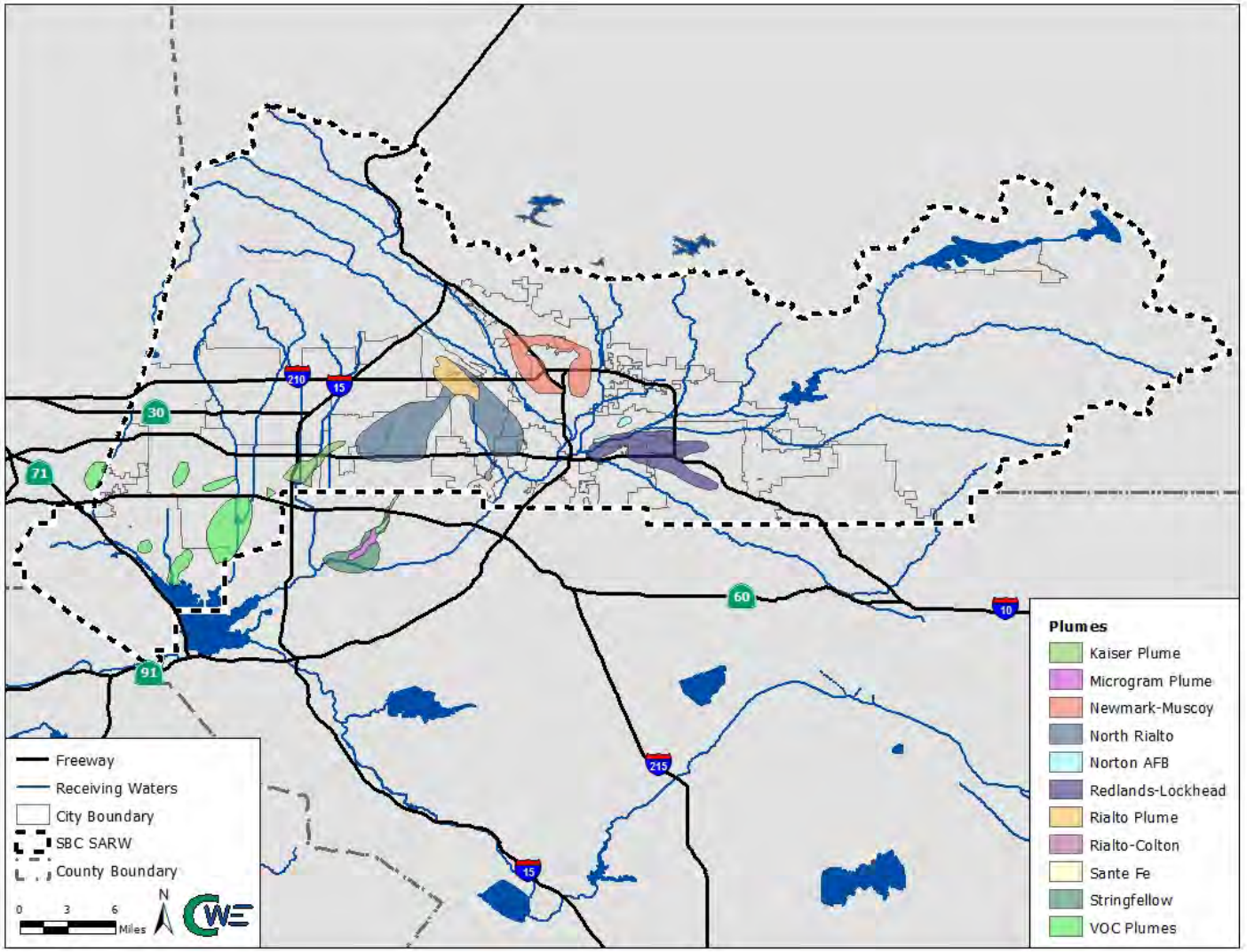


Figure 3-2 Plumes within the SBC SARW Area

3.3 Existing Water Quality Data Sources

Water quality monitoring data, from 2006 to 2016, was collected from numerous sources, but the most useful and highest quality data relevant to the SBC SARW were obtained from SBC Areawide Stormwater Monitoring Programs, which include the following:

- Core and Urban Discharge Mass Emission Monitoring Program (Core Monitoring)
- BBLN TMDL Monitoring:
  - BBL Watershed-Wide Nutrient Monitoring
  - BBL In-Lake Monitoring
- MSAR Bacterial Indicator TMDL/WLA Monitoring

The SBC Areawide Stormwater Monitoring Programs were implemented to fulfill the MS4 Permit requirements. **Table 3-10** summarizes the data availability and utilization for the analysis further detailed in **Section 3.4**. Monitoring locations from these sources are located throughout the SBC SARW area, as illustrated in **Figure 3-3** through **Figure 3-5**. Monitoring data associated with the implementation of these monitoring programs was analyzed to evaluate water quality priorities. This data was utilized to assess the need for projects/programs at key locations within the SBC SARW and quantify benefits related to water quality improvements through load reductions.

The monitoring data from the programs listed above was utilized to assess the baseline water quality of the water bodies within the SBC SARW for which data is available. Core Monitoring sites include permanent and rotating sites, which are organized within the SBCFCD Zones 1, 2, and 3, as shown in **Figure 3-3**. Additional details of the Core Monitoring sites are summarized in **Table 3-11**, BBLN TMDL Monitoring in **Table 3-12**, and MSAR Bacterial Indicator TMDL Monitoring in **Table 3-13**.

Table 3-10 Monitoring Data Availability and Use

Monitoring Program	Dry-Weather		Wet-Weather	
	Data Available	Data Utilized	Data Available	Data Utilized
Core Monitoring				
Permanent Sites	2006-2016[a]	2006-2016[a]	1993-2016	2006-2016
Rotating Sites	2012-2016	2012-2016	2012-2016	2012-2016
BBLN TMDL Monitoring				
BBL Watershed-Wide Nutrient Monitoring	2009-2016	2009-2016	2009-2016	2009-2016
BBL In-Lake Monitoring	2009-2016	2009-2016	2009-2016	2009-2016
MSAR Bacterial Indicator TMDL/WLA Monitoring	2008-2016	2008-2016	2008-2016	2008-2016

[a] Only for Permanent Site 2. Data from 2012-2016 available and utilized for all other Permanent Sites.

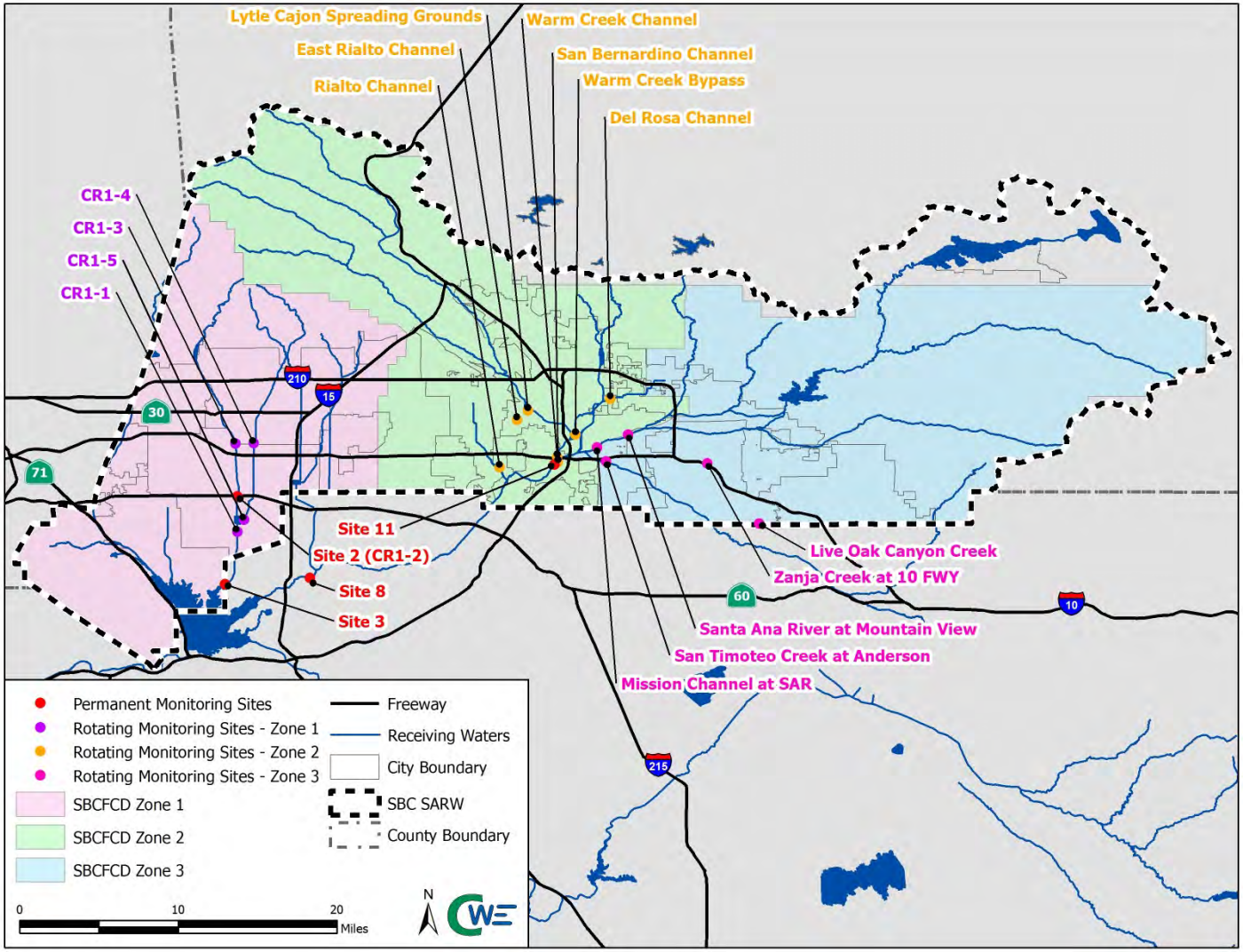


Figure 3-3 Core and Urban Discharge Mass Emission Monitoring Sites

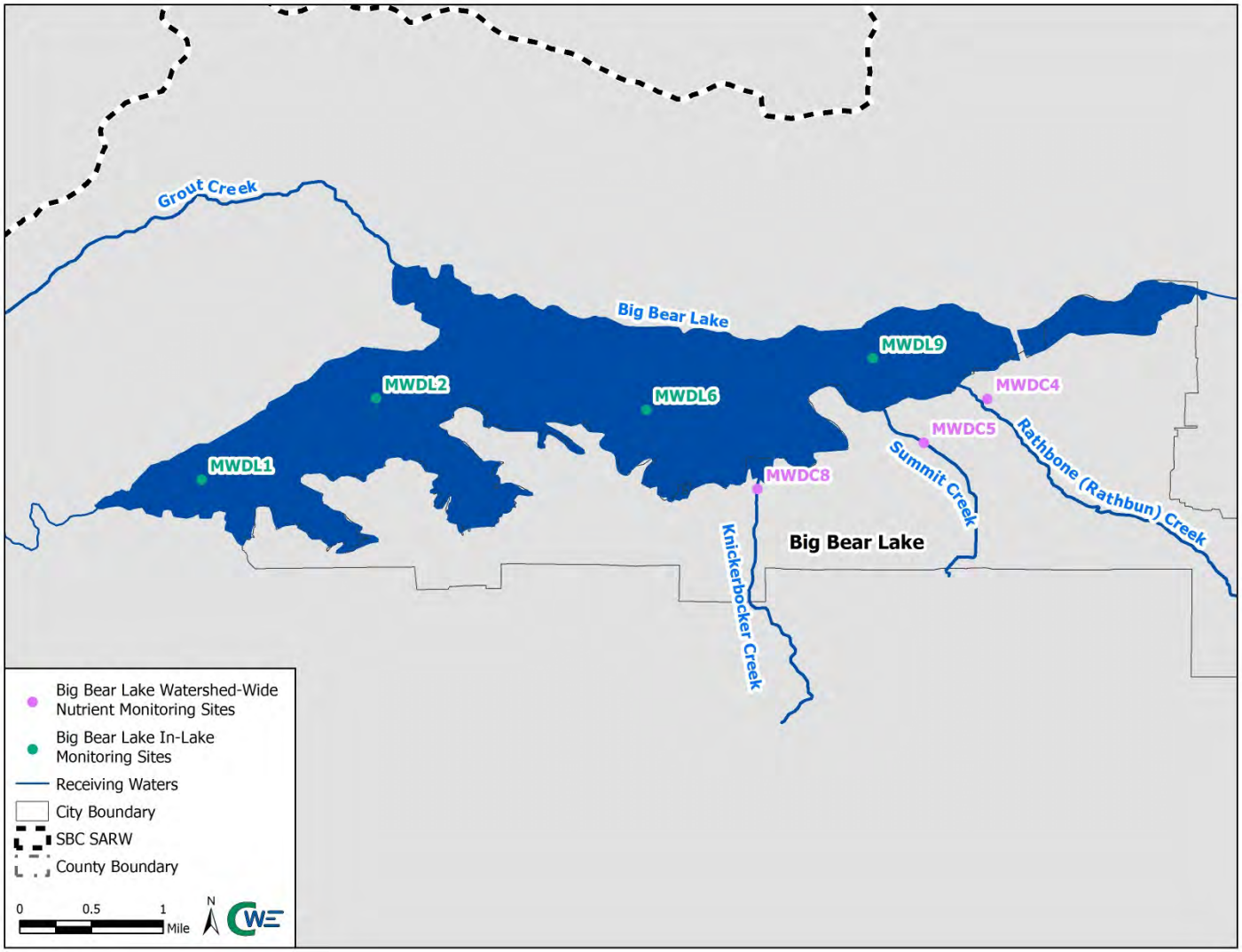


Figure 3-4 Big Bear Lake TMDL Monitoring Sites

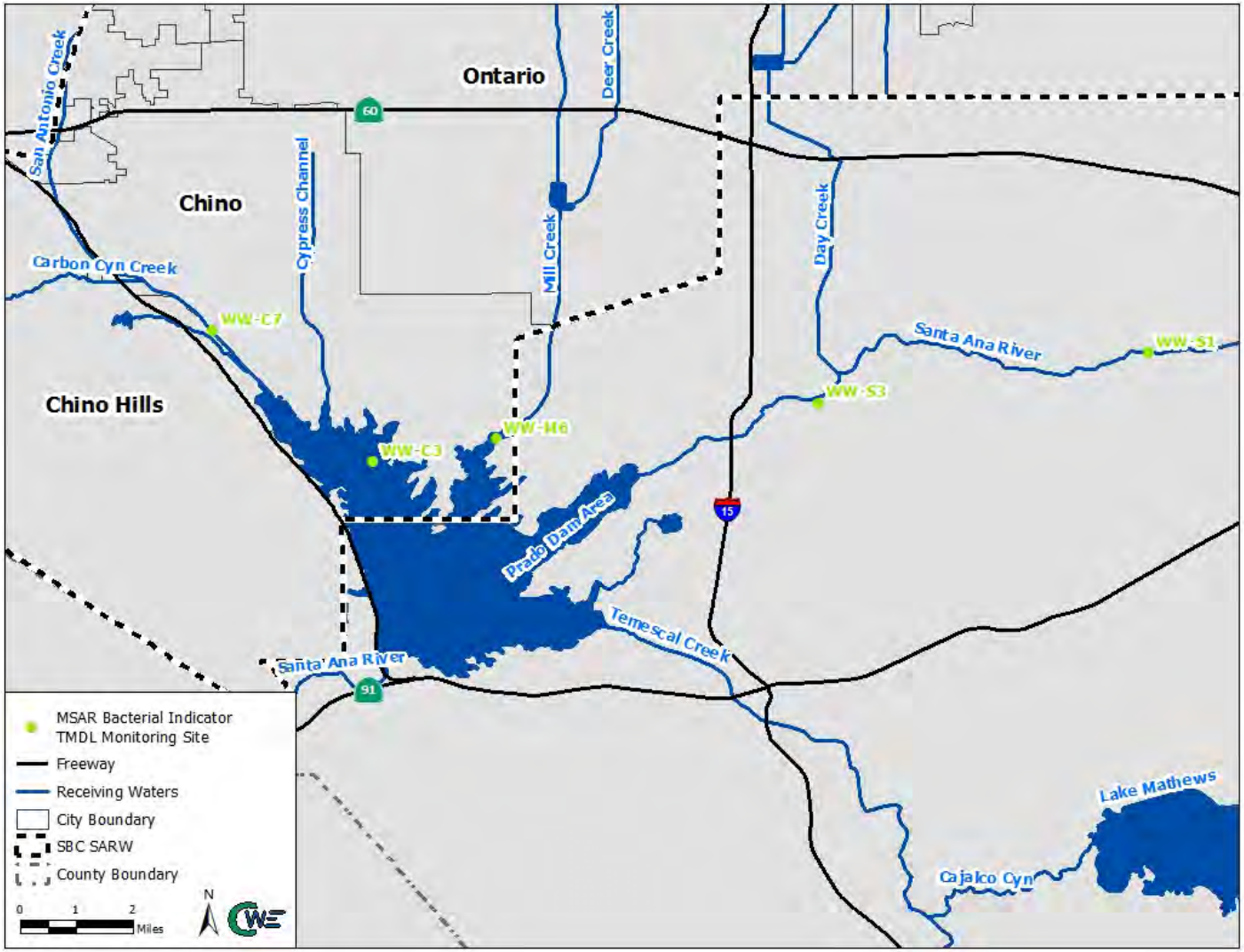


Figure 3-5 MSAR Bacterial Indicator TMDL Monitoring Sites

Table 3-11 Core and Urban Discharge Mass Emission Monitoring Sites

Site No.	Receiving Water	Location	Coordinates	
			Latitude	Longitude
Permanent				
Site 2 (CR1-2)	Cucamonga Creek Reach 1	Cucamonga Creek at Highway 60	34.0295	-117.5993
Site 3	Mill Creek	Cucamonga Channel at Hellman	33.9495	-117.6104
Site 8	SAR Reach 3	SAR at Pedley	33.9552	-117.5328
Site 11	SAR Reach 4	Santa Ana River at Mount Vernon	34.0584	-117.3100
Zone 1 (Rotating)				
CR1-1	Cucamonga Creek Reach 1	Cucamonga Creek at Edison	33.9972	-117.5992
CR1-3	Cucamonga Creek Reach 1	Cucamonga Creek below Turner Basins	34.0775	-117.6010
CR1-4	Deer Creek	Deer Creek above Archibald	34.0755	-117.5935
CR1-5	Deer Creek	Lower Deer Creek above Chris Basin	34.0082	-117.5931
Zone 2 (Rotating)				
WCB	Warm Creek	Warm Creek Bypass	34.0857	-117.2908
DRC	Rialto Channel	Rialto Channel	34.0559	-117.3599
ERC	Rialto Channel	East Rialto Channel	34.0994	-117.3439
SBC	SAR Reach 4	San Bernardino Channel	34.0606	-117.3068
WCC	Warm Creek	Warm Creek Channel	34.0656	-117.3073
DRC	Warm Creek	Del Rosa Channel	34.1184	-117.2589
LCSG	Lytle Creek	Lytle Cajon Spreading Grounds	34.1078	-117.3340
Zone 3 (Rotating)				
LOC3-1	Live Oak Canyon Creek	Live Oak Canyon Creek at County Line	34.0046	-117.1228
STC3-2	San Timoteo Creek Reach 1A	San Timoteo Creek at Anderson	34.0614	-117.2626
MCH3-3	SAR Reach 5	Mission Creek Channel at Santa Ana River	34.0743	-117.2711
ZCC3-4	Zanja Creek	Zanja Creek at Interstate 10 Freeway	34.0595	-117.1704
SAR3-5	SAR Reach 5	SAR at Mountain View	34.0857	-117.2427

Table 3-12 Big Bear Lake TMDL Monitoring Sites

Site ID	Site Description	Latitude	Longitude
Watershed-Wide Nutrient Monitoring			
MWDC4	Rathbun Creek at Sandalwood Avenue	34.2531	-116.8874
MWDC5	West Summit Creek at Swan Drive	34.2487	-116.8938
MWDC8	Knickerbocker Creek at Highway 18	34.2440	-116.9105
In-Lake Monitoring			
MWDL1	BBL – Dam	34.2450	-116.9666
MWDL2	BBL – Gilner Point	34.2532	-116.9490
MWDL6	BBL – Mid Lake Middle	34.2520	-116.9218
MWDL9	BBL – Stanfield Middle	34.2572	-116.8989

Table 3-13 MSAR Bacterial Indicator TMDL Monitoring Sites

Site ID	Location	Latitude	Longitude
WW-C3	Prado Park Lake at Lake Outlet	33.9400	-117.6473
WW-C7	Chino Creek at Central Avenue	33.9737	-117.6884
WW-M6	Mill-Cucamonga Creek below Wetlands	33.9268	-117.6250
WW-S1	SAR Reach 3 at MWD Crossing	33.9681	-117.4479
WW-S3	SAR Reach 3 at Pedley Avenue	33.9552	-117.5328

3.4 Data Analysis Summary

The following subsections describe the water quality conditions based on the Core Monitoring and TMDL monitoring data. The attainment of TMDL numeric targets and Basin Plan WQOs is also discussed.

3.4.1 Core Monitoring Data Analysis

Core Monitoring data was evaluated to determine parameters exceeding water quality standards. The Core Monitoring data was compared to the WQOs for each of the receiving waters. A summary of the findings from the monitoring data evaluation are presented in **Attachment D**. The monitoring data were evaluated with TMDL numeric values, Basin Plan WQOs, and CTR standards for each receiving water when data was available. CTR standards for metals were calculated to correlate with the observed hardness values from each respective sampling event. The tables in **Attachment D** identify a ratio of the total number of exceedances to the total number of available analytical data values in instances where monitoring data exceeded WQOs. The data was also compared in five and ten year data sets in **Attachment D**. A majority of the data from Core Monitoring was collected within the last five years with the exception of Permanent Sites 2, 3, 8, and 11. These monitoring sites have the greatest amount of analytical data available.

The evaluation of the Core Monitoring data suggests a majority of exceedances occur during wet-weather monitoring. Core Monitoring Site 2, located within Cucamonga Creek, mainly exceeded indicator bacteria and copper. Site 3 in Cucamonga Channel, Site 8 at SAR Reach 3, and Site 11 at SAR Reach 4 had higher exceedances ratios for Chemical Oxygen Demand (COD) as well as indicator bacteria. Copper, silver, and zinc also have exceeded wet-weather WQOs throughout many of the sampling locations in the

three rotating zones. In comparison to the Core Monitoring sites during the dry-weather monitoring, data shows exceedances of COD and indicator bacteria, which demonstrate consistent exceedances in either hydrologic condition. However, dry-weather monitoring at SAR Reach 3 showed exceedances of sodium. Due to a limited amount of dry-weather sampling events over a short period of time for the rotating sites, comprehensive data was not available to fully assess the dry-weather conditions of receiving waters within the three rotating zones.

Constituents that show a higher exceedance ratio (greater than 50 percent), excluding priority pollutants from the TMDL and CWA 303(d) List, may be considered priority pollutants in the future, as additional data is available to support that determination. Prioritized pollutants guide the implementation efforts in an attempt to meet TMDL numeric targets and improve water quality within the SBC SARW.

3.4.2 Big Bear Lake Nutrient TMDL

As previously discussed in **Section 3.1.2.1**, conditions for BBLN TMDL and the WLAs and LAs are established for dry hydrological conditions only, which are defined by the conditions observed from 1999-2003: average tributary inflow to BBL is less than 3,049 AF, average lake elevation ranges from 6,671 to 6,735 feet, and annual precipitation ranges from 0 to 23 inches.

Dry hydrologic conditions were not met from 2009-2016; therefore, the TMDL numeric targets do not apply. **Table 3-14** summarizes the average concentrations of chlorophyll *a* and total phosphorus based on the BBL TMDL Annual Reports (2015b). Chlorophyll *a* and total phosphorus numeric TMDL objectives in all other hydrologic conditions do not apply until 2020.

The growing season for chlorophyll *a* is from May 1 to October 31; therefore, data outside of this period were not used to calculate the lake-wide averages. Data for total phosphorus were averaged by taking the arithmetic mean of bottom zone and photic zone samples to get a station sampling date average (see **Figure 3-4** for BBL In-Lake Sampling Stations). Station sampling data averages were then averaged again to get the arithmetic mean over the sampling period.

Table 3-14 BBL In-Lake Chlorophyll *a* and Total Phosphorus Average Concentrations

Year	Chlorophyll *a* Growing Season Average[a] Concentration (µg/L)	Total Phosphorus Annual Average[b] (µg/L)
2009[c]	11.3	41.3
2010[c]	8.6	45.4
2011[c]	7.0	35.9
2012[c]	6.7	34.1
2013[c]	17.1	46.7
2014[c]	15.1	67.1
2015[c]	28.2	50.3
2016[c]	41.8	85.9

[a] Lake-wide average during growing season (May 1 to October 31) no greater than 14 µg/L to be attained no later than 2015 (dry hydrological conditions), 2020 (all other times).
[b] Lake-wide annual average no greater than 35 µg/L to be attained no later than 2015 (dry hydrological conditions), 2020 (all other times).
[c] Wet hydrologic condition, TMDL numeric targets do not apply to wet hydrologic conditions.

Although total phosphorus shows a slight increasing trend, efforts have been made to sequester phosphorus. The 2016 BBLN TMDL Annual Water Quality Report recognizes in mid-2015, the City of Big Bear Lake, SBC, and SBCFCD initiated a joint project with BBMWD to apply 1,553 tons (dry weight) of alum to BBL. The project team applied approximately 574,832 gallons of alum slurry to the lake. The project cost of $747,282 was shared between BBMWD, the Areawide Program Permittees, and the Resorts. It is estimated that this amount of alum sequestered approximately 14,100 pounds of phosphorus and rendered unavailable for plant uptake. Combined with the application conducted in 2004, these parties have sequestered over 31,000 pounds of phosphorus.

BBMWD has primary responsibility for implementing the aquatic weed control program and uses a combination of physical harvesting and USEPA-approved herbicides to reduce Eurasion Water Milfoil. In the year 2000, when SARWQCB staff first began working to develop the TMDL, Eurasion Water Milfoil infested more than one-third of the lake (1,000+ acres). By 2014, routine surveys detected this invasive aquatic plant in less than 100 acres, a 99 percent reduction (see **Figure 3-6**). BBL has been consistently meeting the 2020 TMDL target for eradication of Eurasion Water Milfoil since 2013 (Areawide Program, 2015b).

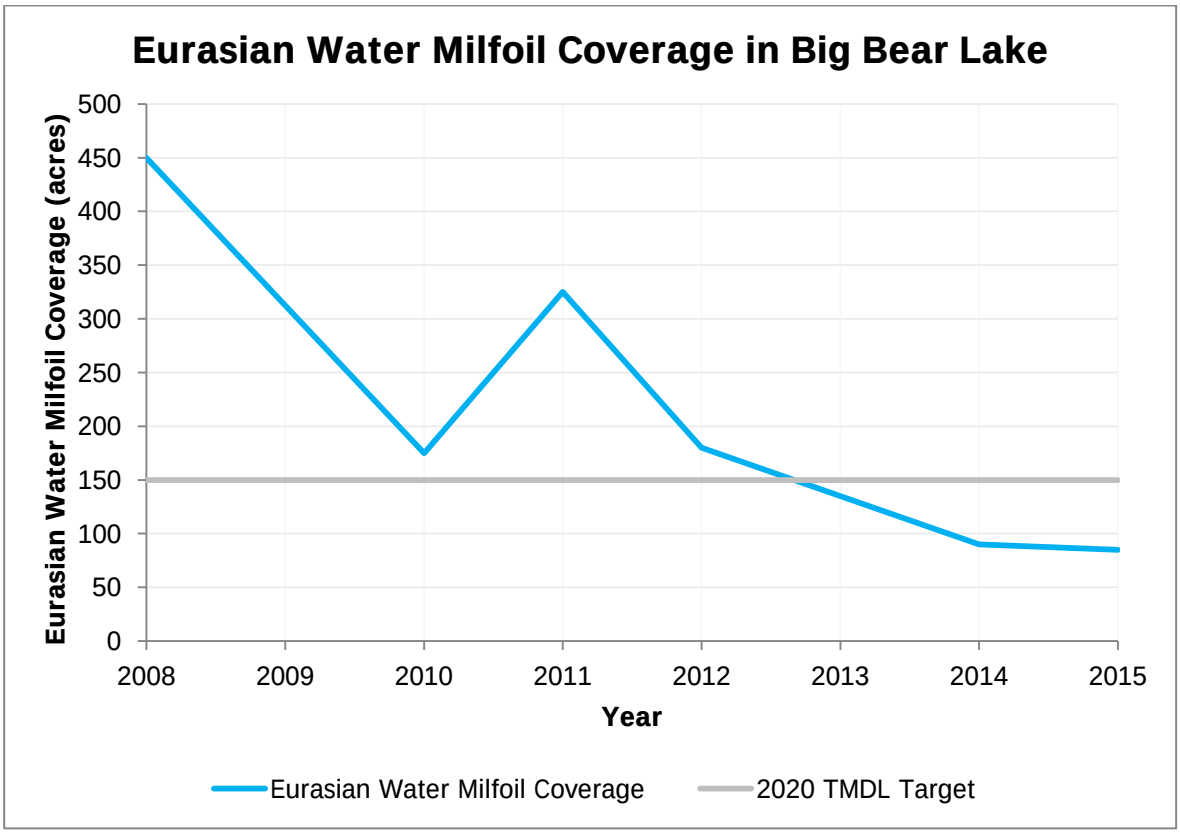


Figure 3-6 Eurasian Water Milfoil Coverage in Big Bear Lake

3.4.3 Middle Santa Ana River Bacterial Indicator TMDL/WLA Monitoring

Stakeholders established the MSAR TMDL Task Force to coordinate TMDL implementation activities designed to manage or eliminate sources of bacterial indicators to water bodies listed as impaired. The TMDL required the establishment of a watershed-wide compliance monitoring program to measure

compliance with numeric targets established by the TMDL, which were derived from Basin Plan objectives established to protect the REC1 beneficial use. The MSAR TMDL Task Force implemented the Santa Ana River Watershed Bacteria Monitoring Program and prepared and submitted the MSAR Water Quality Monitoring Plan and associated Water Quality Assurance Project Plan (QAPP) to the SARWQCB. The TMDL monitoring program was implemented in July 2007, with SARWQCB formal approval in April 2008. Water bodies within the MSAR watershed portion of the SBC SARW and identified in the MSAR Bacterial Indicator TMDL are listed in **Section 3.1.2.2**.

Table 3-15 summarizes the *E. coli* geometric mean criterion exceedance frequency during the 2007-2015 dry seasons. Exceedances were determined based on the REC1 *E. coli* objective of log mean less than 126 organisms/100 milliliters for a 5-day/30-day geomean. The geomean data was prepared using available MSAR Bacterial Indicator TMDL Dry Season Reports and Wet Season Reports. Generally the lowest dry season exceedance frequencies were observed at Prado Park Lake, while Mill-Cucamonga Creek and Chino Creek exhibit the highest exceedance frequencies consistently.

Table 3-15 Frequency of *E. coli* Geomean Exceedances during Dry Seasons

Site	2007[1]	2008	2009	2010	2011	2012	2013	2014	2015
WW-C3 Prado Park Lake	64%	50%	0%	44%	0%	25%	38%	50%	0%
WW-C7 Chino Creek	100%	100%	88%	100%	100%	100%	100%	100%	100%
WW-M6 Mill-Cucamonga Creek	100%	100%	100%	100%	100%	100%	100%	100%	100%
WW-S1 SAR @ MWD Crossing	91%	58%	44%	75%	56%	94%	100%	100%	63%
WW-S3 SAR @ Pedley Avenue	82%	75%	44%	25%	50%	50%	75%	56%	81%

[1] Data retrieved from MSAR Bacterial Indicator TMDL 2010 Triennial Report.

Table 3-16 summarizes the frequency of exceedances based on the proposed *E. coli* objective during the 2007-2008 and 2015-2016 wet seasons. Wet season annual results were variable for Prado Park Lake, SAR at MWD Crossing, and SAR at Pedley Avenue, while the highest exceedance frequencies were consistently observed at Mill-Cucamonga Creek and Chino Creek.

Table 3-16 Frequency of *E. coli* Geomean Exceedances during Wet Seasons

Site	2007-2008[1]	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
WW-C3 Prado Park Lake	53%	70%	82%	73%	45%	9%	0%	45%	53%
WW-C7 Chino Creek	100%	100%	100%	100%	100%	82%	64%	82%	100%
WW-M6 Mill-Cucamonga Creek	100%	100%	91%	91%	100%	100%	100%	63%	100%
WW-S1 SAR @ MWD Crossing	73%	40%	100%	91%	0%	36%	45%	82%	73%
WW-S3 SAR @ Pedley Avenue	63%	40%	82%	100%	100%	36%	36%	27%	63%

[1] Data retrieved from MSAR Bacterial Indicator TMDL 2010 Triennial Report.

3.5 Water Quality Prioritization

Priority pollutants for the SBC SARW were determined based on the number of times a specific pollutant appears on the CWA Section 303(d) List within the SBC SARW, as outlined in **Table 3-17**. The priority pollutants include indicator bacteria, nutrients, and metals (zinc, copper, lead) as identified in **Table 3-18**. The priority pollutants identified in **Table 3-18** are similar to the pollutants identified with a higher percentage of exceedances based on the analyses described above. The TMDL pollutants have been identified as a top priority regardless of the number of times that specific pollutant appeared on the CWA 303(d) List, as a schedule has already been established to address these pollutants in specific water bodies. The number of water bodies impaired (as indicated in the table) was used to prioritize non-TMDL pollutants. Metal constituents were grouped together, which explains why the number of water bodies impaired varies within that prioritization group varies and is not sequential. The top priority pollutant (indicator bacteria) was incorporated into the Stormwater Management Objectives (**Section 1.5**), as further described below **Table 3-18**.

Table 3-17 2016 CWA 303(d) List of Impairments within SBC SARW Priorities

Water Body	Cadmium	Chlordane	COD	Copper	DDT	Lead	Mercury	Noxious / Nuisance Aquatic Plants	Nutrients	Indicator Bacteria	PCBs	pH	Sediment / Siltation	TSS	Zinc
BBL		X			X		X	X	X		X				
Chino Creek Reach 1A									X	X					
Chino Creek Reach 1B			X						X	X					
Chino Creek Reach 2										X		X			
Cucamonga Creek Reach 1	X			X		X				X					X
Cucamonga Creek Reach 2												X			
Grout Creek									X						
Knickerbocker Creek										X					
Mill Creek (Prado Area)									X	X				X	
Mill Creek Reach 1										X					
Mountain Home Creek										X					
Mountain Home Creek, East Fork										X					
Prado Park Lake									X	X					
Prado Flood Control Basin												X			
Rathbone (Rathbun) Creek	X			X					X				X		
San Antonio Creek												X			
San Timoteo Creek Reach 1A										X					
San Timoteo Creek Reach 2										X					
Santa Ana River Reach 3				X		X				X					
Santa Ana River Reach 4										X					
Santa Ana River Reach 6	X			X		X									
Summit Creek									X						
Warm Creek										X					
Total	**3**	**1**	**1**	**4**	**1**	**3**	**1**	**1**	**8**	**15**	**1**	**4**	**1**	**1**	**1**

Table 3-18 Prioritization of Pollutants within the SBC SARW

Priority Ranking	Pollutant Listed on CWA 303(d) List	TMDL	Total # Water Bodies Impaired
1	Indicator bacteria	X	15
2	Noxious (nuisance) aquatic plants	X	1
3	Nutrients	X	8
4 (Metals)	Cadmium		3
	Copper		4
	Lead		3
	Mercury		1
	Zinc		1
5	pH		4
Not Priority	Chlordane		1
	COD		
	DDT		
	PCBs		
	Sediment		
	TSS		

The priority ranking indicates that indicator bacteria is the highest priority of pollutants within the SBC SARW. Indicator bacteria was incorporated into the stormwater management objectives for the entire SBC SARW, as indicated in **Table 1-1**, because it is the highest priority pollutant within the SBC SARW. Indicator bacteria is also associated with the Santa Ana River Bacteria TMDL, which has a deadline for implementation. Using indicator bacteria as a stormwater management objective is a sensible choice for a watershed-wide priority because every possible project within the SBC SARW drains to a water body impaired by indicator bacteria (Chino Creek, Mill Creek – Cucamonga Creek, Prado Park Lake, or Santa Ana River Reach 3). Other pollutants were not included in the stormwater management objectives of SBC SARW because the impairments are of a lower priority or because their impacts are less widespread. However, projects that reduce the pollutant loading of indicator bacteria on impaired watersheds also reduce the pollutant loading of other lower-priority pollutants.

3.6 Contributors to Surface Water Impairments

Dry-weather runoff and stormwater have been characterized as a major source of pollution to the nation's waterways. Various activities within the SBC SARW are identified as potential pollutant sources contributing to water body impairments. This section discusses the priority pollutants impairing the water bodies within the SBC SARW, provides a summary of potential contributors of these pollutants in dry-weather and stormwater runoff, and summarizes the correlation between land use types and pollutant generation. Priority pollutants within the SBC SARW are presented in **Table 3-18**. Potential contributing sources for these priority pollutants include urban development, industrial activities, and agricultural lands, as further discussed below.

Indicator Bacteria/Pathogens

Sources of indicator bacteria within the SBC SARW may be associated with runoff from a mix of urban, agricultural, and open space areas. During dry-weather, receiving water bodies accept nuisance non-stormwater discharges from urban areas. Urban areas contribute to the growth of indicator bacteria within the receiving waters through the discharge of trash, pet waste, and/or sewage leaks. Agricultural areas contribute to indicator bacteria through livestock auction lots and confined feeding operations. Discharges from these agricultural land use areas may include stormwater runoff from manured areas, process wastewater from agricultural operations, and tailings from irrigation of agricultural lands. In the MSAR, the remaining agricultural area is formerly known as the Chino Dairy Preserve, which contains approximately 300,000 cows that can generate the waste equivalent of over two million people. During wet-weather conditions, agricultural land uses are likely to be a major contributor to indicator bacteria.

Nutrients and Noxious (Nuisance) Aquatic Plants

Sources of nutrients (nitrogen and phosphorus) include ubiquitous atmospheric deposition, animal waste, fertilizer use, and soil erosion generated by dairies and other agricultural land uses. Specific regions within the SBC SARW with increased nutrient loads as a result of these sources are the BBL, Cucamonga Channel (lower), Cypress Channel (lower), and San Antonio Channel (lower) Subwatersheds. These areas are also becoming urbanized with increased fertilizer use, yard and pet waste, and car washing activities. These activities also contribute to an increase in nutrient transport that enter the MS4 in dry- and wet-weather runoff and lead to eutrophication in water bodies. Nutrients deposited in the water body can be re-suspended in the water column and become available for biological uptake. Nutrients are also bound in living and dead organic material. Excessive nutrients associated with sedimentation in BBL has led to increased macrophyte (noxious aquatic plants) and algae production, which has adverse effects on aquatic habitat and recreation. Decomposition of the organic material consumes oxygen, resulting in depleted oxygen levels in the water column and can lead to periodic fish kills in BBL.

Metals

Metals loadings vary depending on the seasons; as noted in the Los Angeles Region Regional Water Quality Control Board's Los Angeles River Metals TMDL Basin Plan Amendment (2015), metal loadings during dry-weather are mostly dissolved and attributed to Publicly-Owned Treatment Works (POTWs) that discharge to receiving waters and the MS4 in the form of low-volume non-stormwater discharges from urbanized areas. During wet-weather, metals loadings come in the form of particulates and are normally transported into receiving waters through MS4 stormwater runoff (LARWQCB, 2015). As the tributary areas of Cucamonga Creek Reach 1 and the SAR become more urbanized, metallic loading into receiving bodies through stormwater runoff can be expected to increase. Additionally, metals loadings can occur through atmospheric deposition from paved and unpaved road dust, tire wear, construction dust, timber/brush fires, or other anthropogenic sources (LARWQCB, 2015). These metals are either directly deposited into the receiving water, or more likely, the atmospheric deposition of metals occurs over land surfaces which is later washed into receiving waters by dry-weather runoff and/or storm events. Increased urbanization, and the associated construction activities, can attribute to sediment and metal loading. Metals are known to bind themselves to sediments and may be disturbed from the receiving water's bottom, or the water body's highly erosive tributary area, and transported throughout the watershed during dry- and wet-weather events. Atmospheric deposition of metals and its adsorption to sediment can also be considered a likely source.

Mercury

The mercury impairment in BBL originates from atmospheric deposition, attributed to coal-fired power plants, steel recycling facilities, waste incinerators, cement and lime kilns, smelters and gold mine roasters, pulp and paper mills, and chloralkali factories, as identified in the Big Bear Lake Technical Support Document for Mercury TMDL (2008). It should be noted that this TMDL was never approved. Despite the distance of these facilities being 200 miles away, gaseous elemental mercury [Hg(0)] remains in the atmosphere and contributes to long range transport. Divalent mercury [Hg(II)] is highly soluble and has a tendency to attach to particles. Divalent mercury [Hg(II)] redeposits relatively close to the source, usually within 100 miles. The top five facilities that produce mercury fall under two types, cement manufacturing facilities (four facilities) and one oil refinery. In 2006, 40 percent of total reported mercury emissions in Southern California were attributable to a cement manufacturing company, located approximately 100 miles from the watershed. During wetter years, dissolved loading associated with storm event runoff is assumed to dominate mercury loading to BBL. During dry and normal precipitation years, dry deposition to the lake surface constitutes the majority of loading.

A direct geological source of mercury is also attributable to mineralized areas along fault lines. While BBL Watershed is located in the Transverse Range of the San Bernardino Mountains on the east side of the San Andres Fault, naturally elevated mercury levels have not yet been confirmed. However, potential sources of mercury have been associated with dredging of BBL and the sedimentation basins located at the mouth of associated tributaries. Dredging in BBL is assumed to stir up and distribute methylmercury buried within the sediment. Methylmercury is easily taken up by organisms and bioaccumulates at each trophic level. Fish in BBL have accumulated unacceptable tissue concentrations of mercury even though the ambient water quality standard is met. Other indirect geological sources can stem from historic gold mines in the southwest quadrant of San Bernardino County, and also from brief historical prospecting activities that occurred north and east of Bear Valley.

pH

Water bodies within the SBC SARW area with pH impacts include Chino Creek Reach 2, Cucamonga Creek Reach 1, San Antonio Creek, and the Prado Flood Control Basin. Water bodies impacted by pH are considered to have either low or high pH. The SBC SARW water bodies exceeded pH for both high and low pH, as indicated in **Attachment D**. The Basin Plan indicates water bodies are considered to have low pH when the pH is below 6.5. Source discharge that can contribute to low pH include mine wastes, historic mine sites, acid-generating rocks/soils, industrial plants and other sources of acidic gases, coal pile runoff, industrial effluents, landfill leachate, confined animal feeding operations, dairy runoff, instream oxidation or reduction processes, and recent draining of naturally inundated wetlands or floodplains (USEPA, 2016). A water body is considered to have a high pH, if pH exceeds 8.5 for prolonged periods of time or with high frequency. High pH is less common than low pH as anthropogenic sources are more often acidic than basic. High pH can be caused by discharges from industries that use lime, lye, or sodium hydroxide (NaOH); from agricultural runoff of fertilizers high in lime; and/or industrial landfill leachates that contain solvents or lye. In particular, cement, asphalt, and soap manufacturing may be sources of high pH due to the use of lime or lye. Runoff from limestone gravel roads may increase pH. High pH can be caused in rare cases by natural conditions and mineralogy such as weathering of chalk rock high in carbonates or olivine basalts; however, even in these cases, it is rare for stream pH to exceed 9.5. Leaching of naturally alkaline rocks and soils is exacerbated by physical disturbances such as tilling, mining, and construction. An additional cause of elevated pH is high

photosynthetic activity, which removes carbon dioxide from water favoring equilibrium toward carbonate and a higher pH (USEPA, 2016).

3.6.1 Land Use Type and Potential Pollutants

Urban and stormwater runoff from pervious (lawns, landscaping, parks, construction sites, vacant fields, etc.) and impervious areas (streets, parking lots, storage yards, roofs, etc.) delivers accumulated constituents and pollutants (metals, bacteria, fertilizers, hydrocarbons, etc.) to the MS4 and receiving waters. Although admittedly broad-brushed and variable, past studies suggest that some land use types are greater sources of specific pollutants than others. Manufacturing and industrial facilities have often been reported to generate high concentrations of industrial pollutants, such as metals and oils, while commercial areas are often reported to produce trash or bacteria, and residential areas are associated with nutrients and bacteria. Correlations between land use and potential pollutant generation are presented in **Table 3-19**. This correlation may provide insight as to whether projects/programs proposed in the SWRP at future development stages will result in a pollutant load reduction that benefits a known impairment based on the land use types within the tributary area. The information presented in the table is based on various sources, mainly the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook: New Development and Redevelopment (2003) and A User's Guide for Structural BMP Prioritization and Analysis Tool (SBPAT) Technical Appendices (2008).

Table 3-19 Correlations Between Land Use Type and Pollutant Generation

Land Use Types	General Pollutant Categories								
	Trash & Debris	Sediments	Nutrients	Oil & Grease	Organic Compounds	Pathogens	Heavy Metal	Oxygen Demanding Substances	Pesticides
Agriculture		X	X			X	X	P(1)	X
Commercial	X	P(1)	P(1)	X	P(2)	P(4)		P(5)	P(5)
Education	X	P(1)	P(1)	P(2)	P(2)	P(4)		P(1)	X
Industrial	X	P(1)	P(1)	X	P(2)	P(4)		P(5)	P(5)
Multi-Family Residential	X	X	X	P(2)		P		P(1)	X
Single Family Residential	X	X	X	X		X		X	X
Transportation	X	X	P(1)	X	X(3)		X	P(5)	
Vacant		X	X			P			

X = Anticipated; P = Potential
(1) A potential pollutant if landscaping exists onsite
(2) A potential pollutant if the project includes uncovered parking area
(3) Including petroleum hydrocarbons
(4) A potential pollutant if land use involves food or animal waste products
(5) Including solvents

3.7 Potential Strategies to Address Water Quality Priorities

This section presents a catalog of stormwater and dry-weather runoff capture project types most effective in addressing priority pollutants. Projects and programs that provide multiple benefits, specifically water quality, water supply, flood management, environmental, and community benefits, were identified and prioritized in **Section 6**. The list of project types included herein are intended to address water quality. Projects related to other benefit categories, such as water supply, flood management, environmental, and community, are not discussed below; however, those project types may be enhanced by including stormwater strategies summarized below to provide multiple benefits. The following project types are further detailed within this section:

- Surface infiltration basin
- Underground cistern
- Subsurface infiltration system
- Extended retention wetland
- Seasonal dry detention pond
- Constructed/subsurface flow wetland
- Low-flow diversion pump station
- Sand and media filter
- Membrane filtration
- Ion exchange
- Bioretention planter/rain garden
- Rain barrel
- Infiltration pit/drywell
- Infiltration trench
- Porous/pervious pavement
- Green roof
- Green street
- Connector pipe screen
- Automatic retractable screen
- Hydrodynamic separation device

Details provided below are based on new stormwater projects. Retrofit opportunities may also exist, which are not described in detail below.

Surface Infiltration Basin

Surface infiltration basins make an important contribution towards groundwater management. A key characteristic of these basins is placement over alluvial soils that allow rapid drawdown following a storm event. Careful planning, along with multiple infiltration tests, should be conducted to verify site specific infiltration capabilities. Surface infiltration basins require a larger footprint on the surface as compared to other BMPs. Maintenance of surface infiltration facilities typically requires removal of accumulated sediment and maintenance of vegetation.

Underground Cistern

For areas were infiltration is deemed infeasible, capture and use projects are most favorable, which can be supported using underground cisterns that temporarily store the runoff until needed for non-potable use such as for irrigation. These systems can take many forms such as below grade water tanks, medium sized modular precast concrete units, or very large precast bridge or arch structures. Modular units are installed over a water proof geotextile to retain the water within the cistern. Holding times are a concern with underground cisterns and vector control measures should be implemented if holding times are greater than 72 hours. Additionally, the Department of Public Health may have specific criteria for blended irrigation systems which should be reviewed during the preliminary design period. Well placed access points are necessary to perform the required maintenance, which includes sediment and debris removal using a vacuum truck. Underground storage systems may also be used to support diversion to the sanitary sewer or treatment facilities.

Subsurface Infiltration System

In areas where infiltration is favorable, a similar subsurface cistern design can be used, except the geotextile is omitted so that the runoff may infiltrate into the ground below the cistern and be naturally filtered before recharging the groundwater table. Multiple infiltration tests must be conducted to verify site specific infiltration capabilities, as this BMP requires adequate infiltration to allow the system to drain within 72 hours. Alternatively, vector controls may be implemented to avoid vector concerns. These systems can be implemented with little to no surface area available, which is often desirable when there is limited open space. Maintenance of subsurface infiltration facilities is comparable to the maintenance required for underground cisterns.

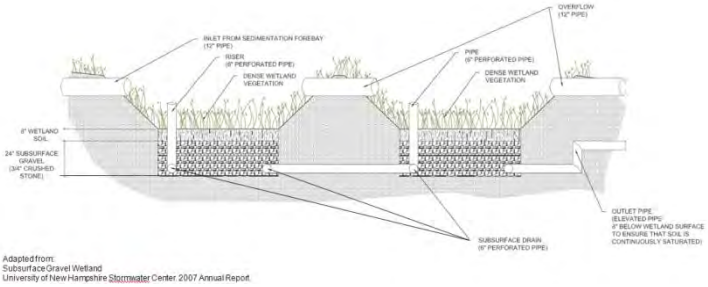
Extended Retention Wetland

Extended retention wetlands are favored where rainfall or runoff is present year round so that replenishment water is available to maintain the wetland and aquatic life. They must also discharge when large storm events or storm event series are encountered. Water depths in extended retention wetlands are greater than depths seen in subsurface flow wetlands; therefore, the area requirements are lessened and there is a significant risk of the water becoming stagnant and overgrown with algae mats. Depending on the anticipated rainfall depth, the volume required for retention could be excessively large, demanding a large wetland area. Maintenance typically requires vegetation management and sediment removal.

Seasonal Dry Detention Pond

Seasonal detention ponds are an effective method for detaining runoff so that it can be metered out through secondary treatment, such as a bioswale, sand filter, or media filter. They are also effective in avoiding damage associated with hydromodification or flooding due to limited downstream conveyance capacity. Maintenance for detention ponds consists of sediment removal and vegetation management.

Constructed/Subsurface Flow Wetland



Adapted from:
Subsurface Gravel Wetland
University of New Hampshire Stormwater Center 2007 Annual Report

Unless extensive land area and substrate is available, subsurface flow wetlands are generally reserved as a tertiary treatment or polish for the effluent from wastewater treatment facilities, but can be utilized in relatively small catchments where nutrients are a significant issue. The design is generally based on either a relatively dependable and consistent inflow or the ability to primarily function in detention rather than extended retention. They may also be practical for remediation of dry-weather and very low first flush runoff drainage systems, so long as higher flows may be diverted away. They are impractical where water depths of over a few feet would be present for more than 72 hours. Maintenance of subsurface wetlands is similar to that of constructed wetlands with additional activities related to maintaining media layers and subsurface piping.

Low-Flow Diversion Pump Station

Low-flow diversion pump stations are operationally straight forward, but connection to the sanitary sewer system can be problematic due to capacity issues, connection limitations, treatment costs, and unexpected prohibitions due to changes in the water quality. Low-flow diversion pump stations are effective at diverting dry-weather flows. Typically, they are constructed adjacent to manholes and are slightly deeper than the adjacent drainage channels such that low-flow runoff is diverted. It is possible to use the low-flow diversion in connection with a detention basin where larger flows can be held during a storm event and/or larger dry-weather events are slowly discharged to the sanitary sewers for treatment. Maintenance for low-flow diversion pump stations can be more expensive than non-mechanical BMPs, as pumps require more specialized maintenance.

Sand and Media Filter

Surface, or Austin sand filters, are at ground-level and typically earthen. They are easy to maintain, but have a large footprint. Perimeter, or Delaware, sand filters consist of two parallel trench chambers located in concrete vaults below an impervious surface, such as a parking lot. Media filters detain and treat stormwater via filtration and adsorption of pollutants to the filter media. Media filters containing both organic and mineral filtration materials generally have greater ion exchange capacity than sand filters, and therefore can more effectively remove soluble metals and other dissolved pollutants. This

renders media filters particularly effective for roadways and highly industrial sites that contribute higher concentrations of metals to stormwater runoff, particularly zinc and copper. Maintenance of sand and media filters requires sediment and debris removal and replacement of the filters as necessary.

Membrane Filtration

Membrane filtration water treatment systems use semi-permeable membranes under high pressure to exude clean product water, leaving behind a brine with the pollutants. The higher pressure membrane types such as reverse osmosis or ultra filtration are highly effective at removing dissolved contaminants, while lower pressure systems filter bacteria and viruses. These systems usually require pretreatment as particulate matter can foul the ion selective membrane and reduce performance. Operation and maintenance costs associated with membrane filtration are high due to the large consumption of energy required for filtration.

Ion Exchange

Ion exchange is a polishing step that specifically targets polar dissolved constituents, such as sulfate. Pretreatment is required prior to ion exchange as suspended solids will clog the exchange columns. Ion exchange systems can be used to treat stormwater from pollution generating impervious surfaces at the end of pipe using a pump system. They are also commonly used to treat contaminated groundwater. Operation and maintenance costs associated with ion exchange are high due to the large consumption of energy required to run an exchange system.

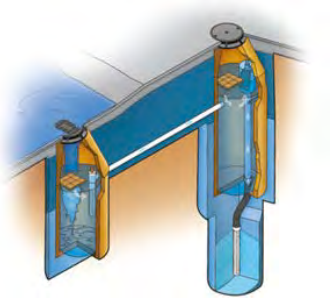
Bioretention Planter/Rain Garden

Bioretention is a promising solution that relies on inundation tolerant vegetation and native or engineered soils with high organic content, to capture, infiltrate, and transpire runoff, while retaining pollutants. If designed properly, especially where native soils are sufficiently permeable and without other constraints to infiltration, rain gardens and larger bioretention facilities can be aesthetic amenities in addition to being cost-effective and scalable stormwater retention sites that are easily integrated into highly urbanized retrofit projects. The planters must be flat and require maintenance such as weeding, trimming, and the replacement of dead plants. These BMPs can be used as infiltration BMPs if soil testing demonstrates suitable rates, otherwise, underdrains can be used and the BMP would be considered a biotreatment BMP.

Rain Barrel

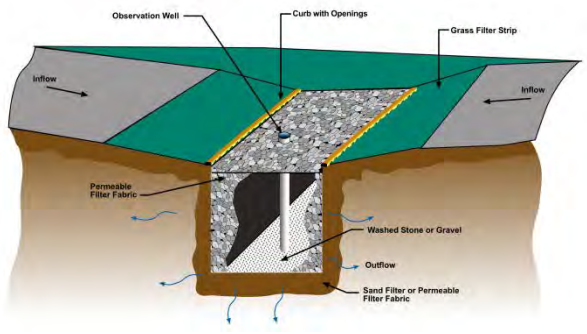
Rain barrels hold roof runoff, usually delivered by rain gutters and downspouts, and store the water for later use. Screen installations at the downspout inlets prevent sediment, leaves, debris, and mosquitoes from entering the rain barrel. Rain barrels are easily constructed for aesthetic purposes to compliment adjacent structures. Overall, maintenance requirements are minimal and include frequent visual inspections during the storm season and removal of accumulated sediment or debris. When effectively designed to capture and contain the runoff from a rooftop structure, a rain barrel can prevent runoff from small frequency storm events from ever leaving the property. This will reduce onsite water usage and the amount of pollutants that may potentially be carried offsite. This BMP can be implemented throughout residential areas.

Infiltration Pit/Drywell



Infiltration pits are typically constructed by digging pits sized to accommodate the runoff source and design storm, lined with geotextile filter fabric, and filled with gravel or aggregate. Infiltration testing will be required to verify infiltration is feasible. The retention volume can be increased using various open retention systems or large diameter plastic half pipes in addition to the aggregate. The surface can be open to accept incoming runoff. A drywell is operationally similar to an infiltration pit, but larger and more formally constructed. Pretreatment techniques are recommended to prevent clogging and maintain infiltration. A drywell can be bored, drilled, a driven shaft, or a dug hole that is deeper than its widest surface dimension, it may be classified as a Class V injection well and requires permitting through the USEPA. Maintenance typically includes removal of sediment and debris from the pretreatment system and monitoring and maintaining adequate infiltration.

Infiltration Trench



An infiltration trench is a shallow impoundment over permeable soil that holds and stores runoff until infiltration can occur, using the natural filtering ability of the soil, or other media such as gravel/sand, to filter out pollutants. Infiltration testing will need to be performed to verify infiltration is feasible. This BMP is effective at retaining sediment associated pollutants, but can become clogged, requiring removal of the upper media. Use of a vegetated swale, or other pretreatment methods, will extend the systems longevity and reduce maintenance costs.

Porous/Pervious Pavement

Porous/pervious pavement allows rainfall to drain into an aggregate bed or structural retention unit where it is stored until infiltration can occur. There are many pervious pavements including porous concrete, plastic grid systems, interlocking paving stones, brick, grass pavers, gravel pavers, and crushed stones. These materials allow for onsite infiltration that efficiently filters out pollutants. Infiltration rates of the native soil are a key element to the overall design and will need to be verified with infiltration testing. This type of BMP can be used to disconnect directly connected impervious areas such as rooftops and parking lots. Vegetated runoff should not drain onto the pervious pavement as it may clog the system and require more frequent maintenance. Permeable pavements may be used in many locations where conventional pavements are used, such as parking lots, driveways, and walkways. Areas with the potential for spills, such as gas stations, should be avoided. Using proper maintenance techniques, pervious pavement can remove a significant portion of pollutants in stormwater runoff and reduce pavement ponding. If infiltration is not supported within a site, underdrains may be used in combination with the pervious pavement section to support a treatment type BMP.

Green Roof

Green roofs are appropriate in some climates, but may be challenging to maintain or support in areas with a risk of brush fires and little annual rainfall. Intensive systems have large depths and cover much of the roof while extensive systems feature minimal plantings that require little maintenance. Green roofs enhance water quality, reduce runoff, and are visually appealing as a rest area above office buildings. The amount of stormwater that a green roof can contain is proportional to the area of coverage, types of plants, slope, and many other factors. Green roofs can be constructed during the building's construction phase or included as a retrofit. When retrofitting, it must be noted that the building needs to support the weight of the green roof under fully saturated conditions. A waterproof membrane should be laid over the building to protect it from structural damage and overflow should be addressed through a drainage layer. Green roofs also provide insulation, help reduce building temperatures during summer months, and counter the heat island effect.

Green Street

Green street design is strongly encouraged and can take many forms, such as an inverted street cross section with a vegetated low center median, vegetated curb extensions, parkways that trap and hold gutter flows, or planter boxes connected to the gutter and filled with highly porous soil and appropriate vegetation. Green streets are most successful in areas were sediment generation is limited or can be accommodated by pretreatment through a bioswale. Porous concrete may be used to construct gutters so that flows may infiltrate. Green streets may include a combination of the BMP types described in this section that can be placed within a street's right-of-way.

Connector Pipe Screen

While several devices have been certified as meeting the definition of FCSs, one commonly installed device is a connector pipe screen. These screens are typically made from stainless steel mesh, with five millimeter openings, that stretch in front of the lateral or outlet from a catch basin and are secured to the walls and floor of the catch basin, with an opening above the screen that is greater in area than the outlet. During most events, runoff will flow through the screen leaving the trash upstream of, or on, the screen. During high intensity storms or if the mesh becomes occluded, runoff can flow over the screen and drain from the catch basin to prevent flooding. Approximately 75-90 percent or more of catch basins can be retrofitted with this device. While regular maintenance to remove debris trapped on and on the upstream side of the screen is required, the intensity of maintenance is correlated with the amount of trash and debris collected. Implementation is relatively straight forward. In locations where the trash load results in excessive maintenance costs, or to provide additional efforts to reduce trash, many jurisdictions also install automatic retracting screens, as further detailed below.

Automatic Retractable Screen

An automatic retractable screen extends across the opening or "mouth" of a catch basin and traps trash and debris at street level where street sweepers or hand crews may remove the trash before it can enter into the catch basin or drain. The screens will open or retract to allow larger flows and trash to enter the catch basin and be trapped on the connector pipe screen to avoid flooding and reduce maintenance costs. Areas that generate sufficient trash and debris to warrant the use of an automatic retractable screen in combination with a connector pipe screen are usually also subject to enhanced street sweeping on a weekly or even more frequent basis.

Hydrodynamic Separation Device

Hydrodynamic separation devices such as a Continuous Deflection Separator (CDS) unit can be used to remove trash from runoff and serve as a pretreatment device for many of the BMPs previously discussed. A CDS unit effectively screens, separates, and traps debris, sediment, oil, and grease from stormwater and urban runoff. As flows travel through the system, a very fine screen deflects the pollutants, which are captured in a litter sump in the center of the system. The water velocities within the swirl chamber continually shear debris off the screen to keep it clean. CDS units are ineffective in removing soluble pollutants and smaller, less-settleable solids. It is recommended that the CDS unit be inspected at least once every thirty days after the wet season. Floatables should be removed and the sump cleaned out. It is also recommended that the CDS be pumped out and the screen inspected for damage at least once per year.

4. Organizations, Coordination, and Collaboration

Many different types of local agencies can directly benefit from projects that address stormwater. These beneficiaries have the potential to be partners and/or collaborators. This section discusses the organizations that the SBCFCD coordinated and collaborated with and/or will need to coordinate with during SWRP implementation. This section also describes what came out/will come out of that coordination and collaboration.

4.1 Local IRWMP

The OWOW 2.0 Plan was prepared by SAWPA and is the current SARW IRWMP. SAWPA spans three counties in Southern California and seeks to provide a collaborative planning process that addresses various aspects of water resources in the SARW. The plan includes an approach for identifying and prioritizing multi-benefit projects and programs, presents innovative solutions, and addresses other water resource related issues.

SAWPA has a planned OWOW Plan update scheduled for 2018. The SBCFCD has been in coordination with SAWPA in an effort to maintain consistency between the OWOW Plan and this SWRP. The geographic focus of the SBC SARW SWRP is limited to the uppermost reaches of the SAR and its tributaries in SBC. The SBC SARW SWRP will be submitted to SAWPA for incorporation into the OWOW Plan, as required based on the SWRP Guidelines (SWRCB, 2015).

4.2 SWRP Consistency with other Plans and Programs

Various plans and programs relevant to this SWRP have been prepared by SBC, local agencies, groups of agencies, and regulatory entities. These documents were reviewed as part of the SWRP development in an effort to maintain consistency and identify opportunities for partnerships and aligning programs. An Annotated List of Data and Reports Technical Memorandum was prepared summarizing the following planning and reference documents and is included in **Attachment A**.

- Integrated Water Management Plans
  - SAWPA's OWOW 2.0 Plan (2014)
  - IEUA's Integrated Water Resources Plan (2016c)
  - SBVMWD's Upper SAR Watershed IRWMP (2015)
  - WMWD's Updated Integrated Regional Water Management Plan (2008)
- Water Quality and Monitoring Plans
  - Basin Plan (SARWQCB, 2005)
  - BBL Watershed-Wide Nutrient Monitoring Plan (SBCFCD, 2012)
  - Comprehensive Bacteria Reduction Plan (CBRP) (SBCFCD, 2011)
  - Hydromodification Management and Monitoring Plan (SBC Areawide Program, 2013a)
  - Integrated Watershed Monitoring Program (SBC Areawide Program, 2011)
  - SARW Bacteria Monitoring Plan (SAWPA, 2016)

- San Bernardino County Stormwater Planning
  - SBC Watershed Action Plan (SBC Areawide Program, 2013c)
  - Technical Guidance Document for Water Quality Management Plans (SBC Areawide Program, 2013b)
  - Municipal Stormwater Management Plan (SBC Areawide Program, 2015a)
- Urban Water Management Plans (UWMPs)
  - IEUA and Water Facilities Authority's 2010 UWMP (2010)
  - SBVMWD's San Bernardino Valley Regional UWMP (2016)
- Other Planning Documents
  - Chino Basin SWRP Functional Equivalency Document (IEUA, 2016a)
  - Chino Basin Watermaster and IEUA's Recharge Master Plan Update (2013)
  - San Bernardino County Department of Public Works (SBCDPW) Master Plans of Drainage
  - SBCDPW's Comprehensive Storm Drain Plans

4.3 Contribution from Local, State, and Federal Agencies

Local, state, and federal agencies, along with NGOs, were consulted during the development of the SBC SARW SWRP. The section below and **Section 8** identify different audiences (agencies and organizations) that were reached out to during the SWRP development, either as part of the Technical Advisory Committee (TAC) and/or stakeholder outreach events. These audiences included elected and appointed officials, municipal and county staff, watershed groups, local water agencies, and NGOs. Multiple events were held during the course of the planning process to gain input from local agencies and NGOs. These events are described further in **Sections 4.4**, **4.5**, and **4.6**.

Section 6 demonstrates that many project partnerships identified in the SWRP involved the SBCFCD and local water agencies. In most cases, agreements are in place between the SBCFCD and the local water agencies, which will allow projects to be more easily implemented, as new agreements are not required. In instances where new agreements are required, the responsible and partnering parties will negotiate terms and develop agreements prior to project/program implementation. New governance structures are not anticipated.

It is not anticipated that local, state, and/or federal regulatory agencies will be required to make decisions during the SWRP implementation phases, except in reference to various permitting requirements that may be applicable, some of which are discussed in **Section 1.3**. Existing monitoring efforts have been approved by local regulatory agencies and will not be altered based on SWRP implementation.

4.4 Technical Advisory Committee

Local agencies and NGOs were invited to form the TAC to support the development of the SBC SARW SWRP. Expert advice and technical support was solicited from the TAC throughout SWRP development. The SWRCB, SARWQCB, and other interested parties were invited based on proximity to the SBC SARW, involvement in similar efforts (watershed planning, multi-benefit projects, etc.), and existing relationships/partnerships. TAC member attendees include the Chino Basin Water Conservation District (CBWCD), IEUA, SARWQCB, SAWPA, SBCDPW, SBCFCD, SBVMWD, and WMWD. **Table 4-1** summarizes

the roles and responsibility of each agency, including those agencies/organizations which were invited, but did not participate in the TAC.

Table 4-1 TAC Roles and Responsibilities

Agency	Status	Role/Responsibility
Bureau of Reclamation	Unable to Participate	Not applicable
CBWCD	Active	Guidance on water accounting and project selection
IEUA	Active	Guidance on water supply, wastewater, recycled water, and joint use project selection
Riverside County Flood Control and Water Conservation District	Invited, No Response	Not applicable
SARWQCB	Active	Guidance on permit requirements and project selection
SAWPA	Active	Guidance on regional water and project selection
San Bernardino County Department of Public Works, NPDES	Active	TAC lead
SBCFCD, Flood Planning	Active	Guidance on flood control and project selection
SBVMWD	Active	Guidance on water supply, groundwater recharge, and project selection
WMWD	Pending	Guidance on groundwater recharge in service area and project selection

A kickoff meeting was conducted on April 12, 2017, followed by three additional meetings, all of which were hosted by the SBCFCD at the SBCDPW building. The kickoff meeting was convened to develop the SWRP water management goals and objectives, formalize roles and responsibilities, and develop scheduling for future meetings. Each TAC member holds the responsibility to represent their agency and provide information related to their agency, as it relates to the SWRP. TAC members were asked to identify documentation, references, and data that would be beneficial in supporting the development of the SWRP. At each meeting, TAC members provided input at major milestones of the SWRP, including project identification, project prioritization, and the draft SWRP. **Table 4-2** summarizes the TAC meeting schedule and purpose, which includes the kickoff meeting and three additional meetings.

Table 4-2 TAC Meeting Schedule and Purpose

TAC Meeting	Schedule	Purpose
Kickoff Meeting	April 12, 2017	➢ Present background/overview of SBC SARW SWRP ➢ Define roles and responsibilities ➢ Discuss water management goals and objectives ➢ Outline TAC involvement and schedule
Meeting #2 (Quantifiable Benefits and Projects)	July 6, 2017	➢ Examine quantifiable benefit goals and targets to be included in the SWRP ➢ Review multi-benefit projects identified in other planning documents that may be included in the SBC SARW SWRP ➢ Identify data needed for projects to quantify benefits

TAC Meeting	Schedule	Purpose
Meeting #3 (Projects)	September 28, 2017	➢ Present/discuss results associated with benefit quantification for example projects ➢ Collaborate on project concepts ➢ Evaluate opportunities to enhance projects to provide additional benefits
Meeting #4 (Draft SWRP)	April 25, 2018	➢ Walk through the Draft SBC SARW SWRP ➢ Discuss structure and key sections ➢ Solicit feedback, comments, questions, and suggestions

4.5 Public Engagement

It is important that the public is aware of the efforts made by the SBCFCD to development the SWRP and are in support of the development and implementation. Their involvement provides meaningful input and ideas that will contribute to the proposed implementation. A Stakeholder and Public Outreach, Education, and Engagement Plan (SPOEEP) was prepared in the early stages of the SWRP development to identify the approach to involve and engage the public. A copy of the SPOEEP is included in **Attachment E**.

Public participation was provided for during the SWRP development in accordance with the SPOEEP. Community participation was most directly accomplished through the public outreach event, which was held following the SWRP Draft development on July 24, 2018. **Section 8.3** discusses the public outreach event in more detail. Additionally, community participation was accomplished through printed materials, development of a SWRP webpage, and through promotion on social media. The SBCFCD solicited public involvement through invitations on social media and distributed print materials for public feedback and review.

4.6 Stakeholder Engagement

The SBCFCD sought opportunities to partner with local stakeholders in the development of this SWRP, project identification/prioritization, and future implementation. Stakeholders participated in the TAC and also attended stakeholder outreach events. Similar to the public engagement discussed above, the stakeholder outreach events were performed in accordance with the SPOEEP included in **Attachment E**. The SBCFCD utilized stakeholder events to solicit technical information and identify projects that include partnerships with the SBCFCD. Potential participants were invited to the stakeholder events held on August 30 and 31, 2017. Educational materials were provided during the stakeholder presentation and comments cards were available for attendees to leave feedback. Additional information is included in **Section 8.2**.

5. Quantitative Methods

The stormwater management objectives for the SBC SARW will be met through various multi-benefit projects located within the SBC SARW. This section presents the approach taken to develop quantitative methodologies for integrated identification, prioritization, and analysis of multi-benefit projects and programs. An overview is provided, which summarizes the applicable Water Code requirements, which provides a context. Existing hydrologic/hydraulic models, water quality models, and other GIS and spreadsheet-based decision support tools and modeling suitable to conduct the metric-based benefit analysis and prioritization of projects was evaluated with respect to the SWRP development. An approach to conduct the metric-based analysis was established based on the evaluation of existing models/tools.

5.1 Overview

California Water Code Section 10562 describes the minimum requirements for development of a SWRP. An outline of how stormwater projects are included, analyzed, and prioritized within the SWRP is included within the minimum requirements. Water Code Section 10562.(b)(2) states that a SWRP shall "identify and prioritize stormwater and dry-weather runoff capture projects for implementation in a quantitative manner, using a metrics-based and integrated evaluation and analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and other community benefits within the watershed." Water Code Section 10562.(e) states that "a stormwater resource plan shall use measurable factors to identify, quantify, and prioritize potential stormwater and dry-weather runoff capture projects." **Figure 5-1** illustrates the steps necessary to identify, quantify, and prioritize projects. The following subsections further describe the actions taken as part of the SBC SARW SWRP development to address the Water Code specifications.

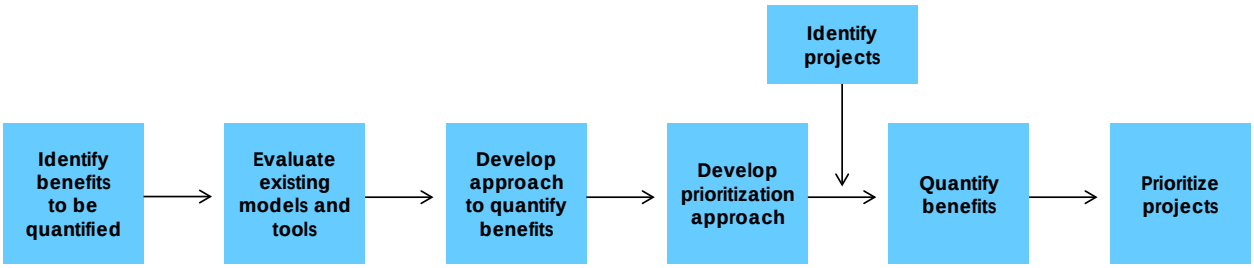


Figure 5-1 Project Identification, Quantification, and Prioritization

5.1.1 Identify

The first step mentioned in the quote above pertaining to Water Code Section 10562.(e) is to identify stormwater projects. A request for projects was made to public entities within the SBC SARW area through the TAC and stakeholder outreach events. Projects received were screened and removed if they did not fit the goals and objectives of the SBC SARW SWRP. Projects were submitted by the local stakeholders listed below:

- SBCFCD
- San Bernardino County Regional Parks Department (SBC Parks)
- CBWCD
- IEUA
- San Bernardino Valley Water Conservation District (SBVWCD)
- SBVMWD
- WMWD
- City of Big Bear Lake
- City of Chino Hills
- City of Montclair
- City of Redlands

5.1.2 Quantify

The second step mentioned in Water Code Section 10562.(e) is to quantify stormwater project benefits. The identification of benefits to be quantified and the methodologies by which benefits were estimated is the focus of this section (**Section 5**). The benefits for quantification fall into the five overarching benefit categories referenced in Water Code Section 10562.(b)(2) and listed in Table 3 of the SWRP Guidelines:

- Water quality
- Water supply
- Flood management
- Environmental
- Community

Table 3 in the SWRP Guidelines (SWRCB, 2015) goes on to give examples of appropriate metrics for each benefit category. Some of the examples given would be difficult to apply to the SBC SARW SWRP. One reason for this is that certain benefit examples are not "measurable," which is a requirement of the Water Code. Another reason is that some of the benefits apply to watersheds in other parts of the state where permanent base flow is a characteristic of the watershed. However, the guidelines also state that "other metrics and methodologies for integrated evaluation and analysis of multiple benefits may be considered, as appropriate."

Table 5-1 identifies the benefits to be quantified as part of the SBC SARW SWRP based on the SWRP Guidelines and local conditions. **Section 5.3** details the approach to quantify the benefits identified in the table below. Each project identified for inclusion will provide benefits from at least two benefit categories (water quality, water supply, flood management, environmental, and community), consistent with SWRP Guidelines Section VI.D.2.

Table 5-1 Multiple Benefits Quantified

Benefit Category	Multiple Benefits Quantified
Water Quality	Pollutant load reduction
	Stormwater runoff reduction
Water Supply	Stormwater recharge
	Recycled water recharge
Flood Management	Runoff rate reduction
	Runoff volume reduction
	Flood elevation reduction
	Removal of parcels/structures from the 100-year floodplain
	Property value saved
Environmental	Wetlands enhancement/creation
	Riparian area enhancement
	Streambed restoration
	Increased urban green space
Community	Provide employment opportunities
	Increase public education
	Increase community involvement
	Walking paths, sidewalks, and bike trails enhancement/creation
	Public use areas enhancement/creation

5.1.3 Prioritize

The third step mentioned in Water Code Section 10562.(e) is to prioritize stormwater projects. Once benefits were quantified, projects were prioritized based on an integrated metrics-based analysis of quantitative and practical factors. The quantitative factors are listed in **Table 5-1**. The practical factors broadly fit into the categories of cost and project readiness. Additional details on the prioritization elements are included in **Section 5.4**. The integrated metrics-based analysis of quantitative and practical factors on a project-specific basis is included in **Section 6**.

5.2 Review of Existing Models and Tools

Existing models and tools were evaluated for use in quantifying benefits. This evaluation includes an analysis of hydrologic/hydraulic models, water quality models, and other GIS and spreadsheet-based decision support tools and modeling suitable to conduct the metrics-based benefit analysis and prioritization of projects. This subsection focuses on the suitability of various models and decision support tools to quantify benefits. Existing models and tools that can be used to quantify the benefits from **Table 5-1** were reviewed and incorporated into the approach as applicable, which is defined further in **Section 5.3**.

5.2.1 Hydrologic/Hydraulic Models

Hydrologic and hydraulic models are used to quantify volumes and rates of water for quantifying water supply and flood control benefits. Hydrologic models identify the volume and timing of stormwater runoff based on watershed properties and geographic location, while hydraulic models generally focus on localized characteristics of water surface height, width, flow velocity, and energy. Hydrologic models found capable of producing output used to quantify benefits include:

- Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS) from USACE
- Watershed Modeling System (WMS) from Aquaveo
- Hydrological Simulation Program – Fortran (HSPF) from USGS
- Wasteload Allocation Model (WLAM) from Wildermuth Environmental, Inc. (WEI)

Computer programs exist that also assist with the calculation of simple hydrologic estimates such as the Rational Method and the unit hydrograph method, which are described in the San Bernardino County Hydrology Manual. CivilDesign Corporation and Advanced Engineering Software (AES) developed software that computes information conforming to the methodology detailed in the San Bernardino County Hydrology Manual. Hydraulic models found capable of producing output used to quantify flood control benefits include:

- Hydrologic Engineering Center – River Analysis System (HEC-RAS) from USACE
- Water Surface Pressure Gradient (WSPG) from the Los Angeles County Flood Control District

5.2.2 Water Quality Models

Water quality models are used to quantify project performance in an effort to establish water quality benefits for projects included in the SWRP. Some water quality models are public domain software and could be used to assess pollutant loading. These models require significant base data for calibration, which is typically not available over extremely large areas like the SBC SARW. Water quality models found capable of producing output used to quantify water quality benefits include:

- Stormwater Management Model (SWMM) from USEPA
- SBPAT from Geosyntec Consultants
- System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN) from USEPA

5.2.3 GIS-Based Decision Support Tools and Models

GIS is a critical component in quantifying benefits that are used to prioritize projects within the SWRP. Decision support tools using GIS have been included in watershed plans throughout the state. In local watershed planning studies, GIS-based tools/models were used to assemble spatial information such as soil type, land use, ground slope, impervious areas, parcels of land, and bodies of water. Points were assigned to each parcel of land that corresponded with prioritization criteria, and parcels were ranked based on the number of points each parcel received, with high scores indicating sites where stormwater projects would be most beneficial or easiest to implement.

With regard to the SBC SARW SWRP, projects have already been identified by stakeholders, and the type of application identified above would not be applicable. However, GIS is critical to the development of input data for hydrologic, hydraulic, and water quality models.

5.2.4 Spreadsheet-Based Decision Support Tools and Models

Spreadsheet-based decision support tools are critical during all phases of the SWRP. Spreadsheets are a necessary component to almost every type of hydrologic, hydraulic, and water quality model discussed in the previous sections. In particular, long-term simulation of watershed hydrology using rain gage data can be calculated with spreadsheets programmed with hydrologic equations. Many other analyses necessary for GIS-based calculations also require spreadsheets.

Spreadsheet-based decision support tools are most helpful during the prioritization phase of project benefit quantification. There are many watershed planning document examples where spreadsheet-based decision support tools were used to prioritize projects given an array of benefits. Some of these tools are readily available through the developers and/or local agencies, while project specific tools are typically developed by the user and tailored to the specific project goals.

5.3 Approach to Quantify Benefits

The benefits used in the SWRP are described in the subsections below. They are arranged according to the five benefit categories listed in Water Code Section 10562.(b)(2), which are also listed in Table 3 of the SWRP Guidelines (SWRCB, 2015). Included in each benefit description is a section on how the benefit achieves the stormwater management goals and objectives, types of projects that can attain the benefit, approach to quantifying the benefit, and metric used to evaluate the benefit.

In some instances, project sponsors had completed studies/analyses that quantified the benefits being considered in the SWRP. For projects where benefits had already been quantified, no further analysis was necessary as a part of the SBC SARW SWRP. This is an appropriate approach to avoid duplicative and unnecessary analysis costs and results. Though in most cases these types of benefits calculations predate the determination of the approach to quantify benefits, the calculations are still valid for the SBC SARW SWRP because they incorporate the physical structure and location of the projects. This approach also avoids having conflicting benefit quantifications. It is understood this may result in a non-uniform comparison. Project sponsors were given the opportunity to review the information included in the SWRP prior to finalization and there were no protests regarding this approach. The approaches outlined below were used for projects where benefits had not already been quantified by the responsible agency.

Projects included in the SWRP are at different stages of planning/design, ranging from ideas to full design plans. Assumptions were made to perform the analyses necessary to quantify benefits when projects lacked certain details necessary to quantify benefits. The benefits quantified as a part of the SBC SARW SWRP are preliminary and refinement will be necessary as the project designs progress.

Benefits described in this section are tangible, measurable, and quantifiable. Additionally, projects included in the SWRP also provide additional intangible, non-measurable benefits that fall under these benefit categories. These intangible benefits are not highlighted in this section.

5.3.1 Water Quality

Water quality benefit goals include opportunities to control stormwater pollution through infiltration and/or treatment processes. **Section 3** describes the water quality priorities within the SBC SARW area. Projects that address the priorities identified provide the greatest benefit to the watershed. Water quality benefits achieved by projects included in the SWRP include pollutant load reduction and stormwater runoff reduction. The tables below summarize the approach to quantify each water quality benefit for the projects identified in the SWRP. Assumptions were made when input data was not readily available. Each of the tables also identifies the project types that would provide the specific benefit.

Table 5-2 Approach to Quantify Pollutant Load Reductions

Goal:	
Reduce the pollutant load from the contributing drainage area to achieve water quality objectives in downstream receiving waters, focusing on the water quality priorities identified in **Section 3**.	
Applicable Models and Tools:	
Custom spreadsheet-based decision support tools with ArcGIS Soil Conservation Service (SCS) Runoff Curve Number method Runoff volume estimation methodology from San Bernardino County Hydrology Manual Data analysis from San Bernardino Areawide Stormwater Monitoring Program Stormwater BMP Database effectiveness calculations	
Input	**Output**
➢ Drainage area ➢ Land use/land cover ➢ Rain depth/patterns (rain gage data) ➢ Infiltration rates ➢ Existing water quality	➢ Volume of runoff ➢ Pollutant load reduction
Metric:	
Removal of _____ *E. coli* per year	
Potential Project Types:	
Projects involving infiltration (basins and/or soft-bottom channels) or treatment BMPs (bioswales)	

Table 5-3 Approach to Quantify Stormwater Runoff Reductions

Goal:	
Reduce volume of stormwater runoff from the project tributary area to downstream receiving waters to improve water quality by reducing the discharge of polluted runoff.	
Applicable Models and Tools:	
Custom spreadsheet-based decision support tools with ArcGIS SCS Runoff Curve Number method Runoff volume estimation methodology from San Bernardino County Hydrology Manual	
Input	**Output**
➢ Drainage area ➢ Land use/land cover ➢ Rain depth/patterns (rain gage data) ➢ Infiltration rates	➢ Volume of runoff captured/infiltrated
Metric:	
_____ acre-feet of runoff reduced per year (AFY)	
Potential Project Types:	
Projects involving basin outlet controls and/or infiltration (includes basins, soft-bottom channels, and/or treatment BMPs that support infiltration [bioswales])	

5.3.2 Water Supply

Water supply benefit goals include opportunities to augment local water sources by storing water in groundwater basins. Water supply benefits quantified as part of the SBC SARW SWRP include groundwater recharge and recycled water recharge. A table for each water supply benefit is included below summarizing how benefits were quantified and which types of projects achieve the specific benefit. Assumptions were made for input variables when information was not readily available.

Table 5-4 Approach to Quantify Stormwater Recharge

Goal:	
Increase the amount of stormwater runoff captured and infiltrated into groundwater basins.	
Applicable Models and Tools:	
Custom spreadsheet-based decision support tools with ArcGIS SCS Runoff Curve Number method Runoff volume estimation methodology from San Bernardino County Hydrology Manual	
Input	**Output**
➢ Drainage area ➢ Land use/land cover ➢ Rain depth/patterns (rain gage data) ➢ Infiltration rates	➢ Volume of runoff infiltrated
Metric:	
_____ acre-feet of stormwater runoff recharged per year (AFY)	
Potential Project Types:	
Projects involving infiltrating at a rate or volume above the existing condition (includes basins, soft-bottom channels, and/or treatment BMPs that support infiltration [bioswales])	

Table 5-5 Approach to Quantify Recycled Water Recharge

Goal:	
Increase the amount of recycled water captured and infiltrated into groundwater basins.	
Applicable Models and Tools:	
Benefit is quantified when analysis available by others, typically the project sponsor	
Input	**Output**
➢ Results from existing hydrologic studies	➢ Volume of recycled water infiltrated
Metric:	
_____ acre-feet of recycled water recharged per year (AFY)	
Potential Project Types:	
Projects able to capture recycled water and involving infiltration at a rate or volume above the existing condition (includes basins, soft-bottom channels, and/or treatment BMPs that support infiltration [bioswales])	

5.3.3 Flood Management

Flood management benefit goals include opportunities to decrease flood risk and minimize property losses. Flood management benefits quantified as part of the SWRP include runoff rate reduction, runoff volume reduction, flood elevation reduction, removal of parcels/structures from the 100-year floodplain, and property value saved. Tables are included below summarizing the approach to quantify each flood management benefit. Example project types that achieve the benefit are included in the table. Assumptions were made when input information was not readily available.

Table 5-6 Approach to Quantify Runoff Rate Reductions

Goal:	
Reduce the peak runoff rate for the 100-year storm event, such that flooding is reduced.	
Applicable Models and Tools:	
Custom spreadsheet-based decision support tools with ArcGIS SCS Runoff Curve Number method Synthetic unit hydrograph estimation methodology from San Bernardino County Hydrology Manual Stage-storage, stage-discharge, and culvert analysis from Hydraflow Express Flow routing and timing using HEC-HMS	
Input	**Output**
➢ Drainage area ➢ Land use/land cover ➢ As-built plans ➢ Infiltration rates ➢ 100-year storm event rainfall	➢ Peak flow rate reduction due to diversion or infiltration improvements ➢ Peak flow rate reduction due to basin outlet reconfiguration
Metric:	
Runoff rate reduction of _____ cubic feet per second (cfs) during the 100-year storm event	
Potential Project Types:	
Projects that detain stormwater and/or enhance infiltration (includes basins and soft-bottom channels)	

Table 5-7 Approach to Quantify Runoff Volume Reductions

Goal:	
Reduce the volume of floodwaters reaching downstream conveyances, such that additional capacity is available downstream and flooding is reduced.	
Applicable Models and Tools:	
Custom spreadsheet-based decision support tools with ArcGIS SCS Runoff Curve Number method Runoff volume estimation methodology from San Bernardino County Hydrology Manual	
Input	**Output**
➢ Drainage area ➢ Land use/land cover ➢ Rain depth/patterns (rain gage data) ➢ Infiltration rates	➢ Volume of runoff diverted from downstream conveyances
Metric:	
Runoff reduction of _____ acre-feet per year (AFY)	
Potential Project Types:	
Project designed to detain stormwater, including infiltration (includes basins, soft-bottom channels, and/or treatment BMPs that support infiltration [bioswales])	

Table 5-8 Approach to Quantify Flood Elevation Reductions

Goal:	
Reduce flood elevation (water surface elevation) of the 100-year flood in conveyances downstream, which reduces the risk to property damage or loss caused by flooding.	
Applicable Models and Tools:	
Hydraulic analysis using HEC-RAS SCS Runoff Curve Number method Synthetic unit hydrograph estimation methodology from San Bernardino County Hydrology Manual Stage-storage, stage-discharge, and culvert analysis from Hydraflow Express Flow routing and timing using HEC-HMS	
Input	**Output**
➢ Drainage area ➢ Land use/land cover ➢ As-built and proposed channel plans ➢ 100-year storm event rainfall	➢ Water surface elevation profile
Metric:	
Water surface elevation reduction of _____ feet during the 100-year storm event	
Potential Project Types:	
Projects where channels are enlarged to convey additional flow or provide a runoff peak rate reduction through detention of flood flows (include channel widening/improvement and infiltration basin projects where infiltration is enhanced by manipulating the geometry of outflow structures)	

Table 5-9 Approach to Quantify Removal of Parcels/Structures from the Floodplain

Goal:	
Remove parcels/structures from the 100-year floodplain, decreasing the risk of losing property or human life due to flooding.	
Applicable Models and Tools:	
Custom spreadsheet-based decision support tools with ArcGIS Hydraulic analysis using HEC-RAS	
Input	**Output**
➢ Flood maps from FEMA ➢ San Bernardino County parcel maps ➢ HEC-RAS flood elevation analysis	➢ List of parcels removed from flood hazard area
Metric:	
Removal of _____ parcels/structures from the 100-year floodplain (measured in units of parcels or structures, depending on what makes the most sense for each geographic location)	
Potential Project Types:	
See project types identified under the flood elevation reduction benefit (**Table 5-8**)	

Table 5-10 Approach to Quantify Property Value Saved

Goal:	
Decrease property losses due to flooding.	
Applicable Models and Tools:	
List of parcels removed from flood hazard area San Bernardino County assessor data Home price estimates from Zillow.com	
Input	**Output**
➢ Parcels and structures removed from flood hazard areas	➢ Total value of parcels and structures removed from flood hazard areas
Metric:	
$_____ saved (in 2017 dollars) during one 100-year flood event	
Potential Project Types:	
See project types identified under the flood elevation reduction benefit (**Table 5-8**)	

5.3.4 Environmental

Environmental benefit goals include opportunities to enhance habitat and open space through the implementation of stormwater projects. Environmental benefits being quantified in the SWRP include wetlands enhancement/creation, riparian area enhancement, streambed restoration, and increased urban green space. A table is included below for each benefit. The tables summarize the approach used to quantify the benefit and the types of projects the benefit is applicable to. Assumptions were made when quantifying benefits if the input data was not readily available.

Table 5-11 Approach to Quantify Wetlands Enhancement/Creation

Goal:	
Enhance/create wetlands to protect and improve habitat for species dependent on aquatic habitats for survival. Wetlands enhancement/creation replaces wetland habitat lost due to the process of urbanization.	
Applicable Models and Tools:	
ArcGIS	
Input	**Output**
➢ Conceptual plans ➢ Construction plans	➢ Areas where wetlands will be enhanced/created
Metric:	
_____ acres of wetlands enhanced/created	
Potential Project Types:	
Projects involving wetland enhancement/creation	

Table 5-12 Approach to Quantify Riparian Area Enhancement

Goal:	
Riparian area enhancement helps protect and improve riparian habitat, which is important to protecting biodiversity, maintaining/improving water quality, and protecting channel slopes, among other benefits.	
Applicable Models and Tools:	
ArcGIS	
Input	**Output**
➢ Conceptual plans ➢ Construction plans	➢ Areas where riparian area is created/enhanced
Metric:	
_____ acres of riparian area enhanced	
Potential Project Types:	
Enhancing riparian areas in highly urbanized/semi-arid areas is difficult given the ecological stresses imposed by development and drought. Achieving biodiversity in an artificially-created riparian zone is possible and can be managed through careful design of channel-side bioswales. In non-urbanized areas, riparian areas can be enhanced by creating channel conveyances that mimic natural conditions.	

Table 5-13 Approach to Quantify Streambed Restoration

Goal:	
Restore or enhance natural streambeds for the protection of fish and wildlife habitat. Streambed restoration can also stimulate the natural scour and sedimentation processes essential to creating coarse sandy loam habitat for the endangered San Bernardino kangaroo rat.	
Applicable Models and Tools:	
ArcGIS	
Input	**Output**
➢ Conceptual plans ➢ Construction plans	➢ Areas where streambeds will be constructed to mimic natural conditions
Metric:	
_____ feet of streambed restored, improved, or enhanced	
Potential Project Types:	
Channel enhancement projects located in natural sections of receiving waters (commonly in the eastern portion of the SBC SARW area)	

Table 5-14 Approach to Quantify Increased Urban Green Space

Goal:	
Increase urban green space by providing trees, shrubs, and grasses that can filter pollution from air, water, and soils. Urban green space also provides community benefits of increased access to spaces for recreation, exercise, communing with nature, neighborhood cohesion, and intangible social benefits associated with lower crime rates and improved property values.	
Applicable Models and Tools:	
ArcGIS	
Input	**Output**
➢ Conceptual plans ➢ Construction plans	➢ Areas where urban green space will be created or enhanced
Metric:	
_____ acres of urban green space added	
Potential Project Types:	
Projects that involve public use, where landscaping and tree-planting are essential components of the project (includes trail projects adjoining channels and projects with biological treatment of stormwater, where plants constitute a necessary water quality component)	

5.3.5 Community

Community benefit goals include opportunities to improve community health, safety, recreation, and sense of cohesiveness, particularly within disadvantaged communities. Community benefits being quantified in the SWRP include providing employment opportunities; increasing public education; increasing community involvement; walking paths, sidewalks, and bike trails enhancement/creation; and public use areas enhancement/creation. The approach used to quantify each community benefit is summarized in the tables below, which also identify project types that would achieve the specific benefit. Assumptions were made during the analysis when input data was not readily available.

Table 5-15 Approach to Quantify Provided Employment Opportunities

Goal:	
Increase the number of jobs for members of the community.	
Applicable Models and Tools:	
Estimates of job creation rates due to government infrastructure spending from the American Recovery and Reinvestment Act (Executive Office of the President – Council of Economic Advisors, 2009)	
Input	**Output**
➢ Project cost estimates	➢ Jobs created, in job-years (one job for a year)
Metric:	
_____ employment opportunities provided	
Potential Project Types:	
All projects, as short-term employment is provided to implement the project and long-term employment may be introduced based on continued operation and maintenance of the facilities.	

Table 5-16 Approach to Quantify Increased Public Education

Goal:	
Increase public education associated with stormwater quality and multi-benefit project implementation, such that the public's understanding of water quality protection results in water quality improvements.	
Applicable Models and Tools:	
Not applicable	
Input	**Output**
➢ Concept plans ➢ Construction plans ➢ Project-specific implementation plans	➢ Number of interpretive signs installed as part of the project
Metric:	
_____ interpretive signs installed as part of the project	
Potential Project Types:	
Projects that involve educational signage, which are typical for projects that are in public right-of-way or include public use benefits, such as trails along channels.	

Table 5-17 Approach to Quantify Increased Community Involvement

Goal:	
Enhance public participation in the design/implementation phase of a project. Project buy-in can occur when designers have taken the time to involve the community, which yields long-term community cohesion benefits.	
Applicable Models and Tools:	
Not applicable	
Input	**Output**
➢ Project-specific implementation plans	➢ Number of community meetings planned
Metric:	
_____ community meetings planned	
Potential Project Types:	
Projects that involve community meetings during the design and implementation phases, which is typical of larger projects that include public use benefits, such as along a trail/park.	

Table 5-18 Approach to Quantify Path, Sidewalk, and Bike Trail Enhancement/Creation

Goal:	
Enhance/create walking paths, sidewalks, and bike trails, which provide community benefits by increasing connectivity, supporting multi-modal transportation, and encouraging a healthy community.	
Applicable Models and Tools:	
ArcGIS	
Input	**Output**
➢ Concept plans ➢ Construction plans	➢ Linear feet of walking paths/trails, sidewalks, and/or bike trails enhanced or created
Metric:	
_____ feet of walking paths, sidewalks, and/or bike trails enhanced/created	
Potential Project Types:	
Projects that involve walking paths, sidewalks, and/or bike trails, which are most likely along channel improvement projects.	

Table 5-19 Approach to Quantify Public Use Area Enhancements/Creation

Goal:	
Provide space for communities to gather and recreate, especially within disadvantaged communities, which have been neglected historically in terms of the development of public spaces. Enhancing/creating certain types of public use areas may result in health and social benefits.	
Applicable Models and Tools:	
ArcGIS	
Input	**Output**
➢ Concept plans ➢ Construction plans	➢ Acreage of public use areas created or enhanced
Metric:	
_____ acres of public use area enhanced/created	
Potential Project Types:	
Projects that involve publically accessed parks, trails, and open spaces, which may be included in projects inclusive of trails along channel improvements.	

5.4 Prioritizing Projects based on Multiple Benefits

Section D.1 of the SWRP Guidelines (2015) provides guidance for prioritizing stormwater and dry-weather runoff capture projects within a watershed. The guidance indicates that the prioritization of individual projects and programs for implementation should be based on an integration of quantitative factors and elements. The elements are listed in the following order (Section D.1.a through Section D.1.f).

a. Projects/programs supported by entities that have created permanent, local, or regional funding

b. Projects or programs that use a metrics-driven approach and an appropriately detailed geospatial analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and community benefits within the watershed

c. Projects located on lands with public ownership

d. Projects that augment local water supplies

e. Projects and programs that preserve, restore, or enhance watershed processes that yield a broad suite of water quality benefits and support beneficial uses

f. Projects and programs that create or restore habitat, open space, parks, recreation, or green open space in disadvantaged communities with a high deficit of tree canopy, parks, and open space

The prioritization for the SBC SARW SWRP is based on an integrated metrics-based analysis of these factors. The interpretation and quantification of these factors is discussed further in **Section 5.4.1**, including the assignment of numeric codes based on these prioritization elements. The methodology for combining the codes into a prioritization matrix is discussed further in **Section 5.4.2**.

5.4.1 Prioritization Elements

A discussion of each prioritization factor and element proposed for the SBC SARW SWRP based on these guidelines is included in the following subsections. Each element will convert into a numeric code to evaluate the project's conformance with each element. The codes will be developed such that low numbers indicate the more preferred values.

The prioritization of projects in the SBC SARW SWRP is based on a strict hierarchal prioritization discussed in the sections below. That is, the prioritization methodology favors projects that perform well on the first categories over projects that perform well over later categories. This approach aligns with the order of prioritization factors listed in Section D.1 of the SWRP Guidelines (2015). More information about each prioritization factor is included in the subsections below.

5.4.1.1 Project Readiness

Section D.1.a of the SWRP Guidelines (2015) indicates that the SWRCB places a high priority on projects or programs that are already supported by a public agency that is responsible for funding both capital improvements and operations and maintenance. The best way to indicate whether or not a given project is already supported by a public agency is if that public agency has signed off on detailed concept plans or construction plans developed to any level of completeness. The existence of plan drawings and/or concepts indicates a level of intent from a public agency that they are willing to commit time and resources to the project. Also, projects that have plans are more ready for construction than projects that are currently just ideas or rough concepts.

Accordingly, the first prioritization factor in the SBC SARW SWRP will be a Project Readiness factor that indicates whether or not a public agency has signed off on concept plans or construction plans. If the public agency has approved plans for the project, the project will be deemed approved or ready. If no plans exist for the project, the project will be deemed not approved or ready. **Table 5-20** summarizes the prioritization code for this factor.

Table 5-20 Project Readiness Code Definition

Code Value	Project Readiness
1	Approved or ready
2	Not approved or ready

5.4.1.2 Cost Estimate

Another quantitative proxy for a project's readiness is the existence of a cost estimate prepared by an engineer. The existence of a cost estimate indicates that a public agency has examined the project from an engineer's perspective to estimate the time and materials needed to complete the project, even if the cost estimate is preliminary. The second prioritization factor in the SBC SARW SWRP will be a Cost Estimate factor that indicates whether or not a cost estimate exists for the project. **Table 5-21** indicates the prioritization code for this factor.

Table 5-21 Cost Estimate Code Definition

Code Value	Cost Estimate
1	Cost estimate has been prepared
2	Cost estimate has not been prepared

5.4.1.3 Quantification

Section D.1.b. of the SWRP Guidelines (2015) states that "[p]rojects or programs that use a metrics-driven approach and an appropriately detailed geospatial analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and community benefits within the watershed" should be prioritized in an SWRP. Therefore, projects where an analysis has been performed quantifying these benefits should be prioritized in the SBC SARW SWRP over projects where the benefits have simply been assumed to exist. Benefit quantification is also an indication of project readiness; only when an element of a project is defined and described can the element's effect on public water quality and supply be evaluated to any level of certainty.

The third prioritization factor in the SBC SARW SWRP will be a Quantification factor that indicates whether or not a metrics-based analysis of a project's multiple benefits has been performed. **Table 5-22** reveals the prioritization code for this factor.

Table 5-22 Quantification Code Definition

Code Value	Quantification
1	Benefits have been quantified
2	Benefits have not been quantified

5.4.1.4 Benefit Categories

The intention of the Water Code requirements is to encourage stormwater and dry-weather runoff projects that provide multiple public water quality and supply benefits, according to the SWRP Guidelines (SWRCB, 2015). The SWRP Guidelines go on to explain that each project or program included in an SWRP should address at least two or more main benefits and as many feasible additional benefits as possible. This guidance indicates that the SWRCB considers the number of benefit categories as an important factor with which to prioritize projects in the SWRP.

The fourth prioritization factor in the SBC SARW SWRP will be a Benefit Categories factor that describes the number of benefit categories that a project will provide. The five benefit categories, as described in Water Code Section 10562.(b)(2), which are also listed in Table 3 of the SWRP Guidelines and described

in **Section 5.3**, are water supply, water quality, flood management, environmental, and community benefits. **Table 5-23** describes the prioritization code for this factor.

Table 5-23 Benefit Categories Code Definition

Code Value	Benefit Categories
1	Project provides benefits across five (5) categories
2	Project provides benefits across four (4) categories
3	Project provides benefits across three (3) categories
4	Project provides benefits across two (2) categories
5	Project provides benefits in one (1) category

5.4.1.5 Water Supply Cost

Section D.1.d of the SWRP Guidelines (SWRCB, 2015) indicates that a SWRP should prioritize projects that augment local water supplies such as projects that use captured stormwater and dry-weather runoff to recharge groundwater. Project readiness elements and multiple benefits are a greater priority than this element based on the prioritization elements listed in the SWRP Guidelines. For this reason, the Water Supply Cost prioritization element will be placed in the SBC SARW SWRP after these elements of project prioritization.

The SBC SARW SWRP contains a mix of both large and small projects. Large projects tend to capture large quantities of stormwater, but at a higher project cost than small projects. If projects were prioritized only by the quantity of stormwater supplied, large costly projects would always be placed ahead of small projects regardless of the cost effectiveness of the project. This is a potential waste of public money. Therefore, in the SBC SARW SWRP, prioritization for water supply benefits provided will be normalized according to the cost of water supplied per acre-foot per year. The breakdown of the range of water supply costs is described in **Table 5-24**.

Table 5-24 Water Supply Cost Code Definition

Code Value	Water Supply Cost per Acre-Foot per Year
1	Less than $5,000
2	Between $5,000 and $10,000
3	Between $10,000 and $50,000
4	Between $50,000 and $100,000
5	Between $100,000 and $200,000
6	Between $200,000 and $500,000
7	Between $500,000 and $1,000,000
8	Greater than $1,000,000
9	Project provides no benefit to groundwater recharge/benefits are unquantified

5.4.1.6 Water Quality Cost

Section D.1.e of the SWRP Guidelines (SWRCB, 2015) states that "[p]rojects and programs that preserve, restore, or enhance watershed processes that yield a broad suite of water quality benefits and support

beneficial uses" should be prioritized in an SWRP. This element is placed sixth on the list after the elements described above.

In the SBC SARW, the beneficial uses of the water bodies within the watershed are impacted primarily by the presence of indicator bacteria, which is further discussed in **Section 3**. Within the SBC SARW SWRP a water quality benefit will be assigned primarily on projects that reduce the quantity of *E. coli* bacteria.

Similar to the Water Supply Cost prioritization element described in **Section 5.4.1.5**, the Water Quality Cost prioritization element is structured in a way to level the playing field between large and small projects by comparing the project cost and bacteria removal. The most cost efficient projects will attain a lower code value, as described in **Table 5-25**.

Table 5-25 Water Quality Cost Code Definition

Code Value	Water Quality Cost per Billion *E. coli* Bacteria Removed per Year
1	Less than $50
2	Between $50 and $100
3	Between $100 and $500
4	Between $500 and $1,000
5	Between $1,000 and $2,000
6	Between $2,000 and $5,000
7	Between $5,000 and $10,000
8	Greater than $10,000
9	Project provides no water quality benefit/benefits are unquantified

5.4.2 Ranking Methodology

The projects are included in a prioritization matrix and assigned prioritization codes based on the elements described in **Section 5.4.1**. The one-digit codes in the six prioritization elements will be combined into a six-digit ranking code for each project, assembled from the prioritization elements in the order listed in **Section 5.4.1**. This order is related to the order of prioritization elements listed in Section D.1 of the SWRP Guidelines (SWRCB, 2015).

The projects will then be ordered from first to last, with the lowest numeric value of ranking code being listed first and higher numeric value of ranking code being listed last. The completed prioritization matrix is further discussed in **Section 6.3**.

6. Project Identification and Prioritization

Multi-benefit stormwater management projects located throughout the SBC SARW will help achieve the stormwater management objectives for the watershed. The projects propose enhancement of existing stormwater infrastructure and construction of new improvements to capture stormwater and dry-weather runoff and achieve multiple benefits. This section describes the process used to identify projects, results of the benefit analysis utilizing the approach described in **Section 5.3**, project prioritization in accordance to the approach included in **Section 5.4**. This section also includes an assessment of the stormwater management objectives, as originally defined in **Section 1.5**.

6.1 Project Identification

A project must be included in a SWRP to receive grant funding from the State of California, according to state law. California Water Code Section 10563 (c)(1) states that "the development of a stormwater resource plan … shall be required to receive grants for stormwater and dry-weather runoff capture projects from a bond act approved by the voters after January 1, 2014."

As mentioned above, the SBCFCD received input from the following agencies for inclusion in the SWRP in response to project solicitation through the TAC and stakeholder outreach events:

- SBCFCD
- SBC Parks
- CBWCD
- IEUA
- SBVWCD
- SBVMWD
- WMWD
- City of Big Bear Lake
- City of Chino Hills
- City of Montclair
- City of Redlands

Figure 6-1 illustrates the project locations and **Table 6-1** lists the projects approved for inclusion in this SWRP. The order listed in the page is not associated with the prioritization, which is further discussed in **Section 6.3**. The table identifies the lead/responsible agency for each project with a brief project description. Figures illustrating the project locations are included in **Attachment F**.

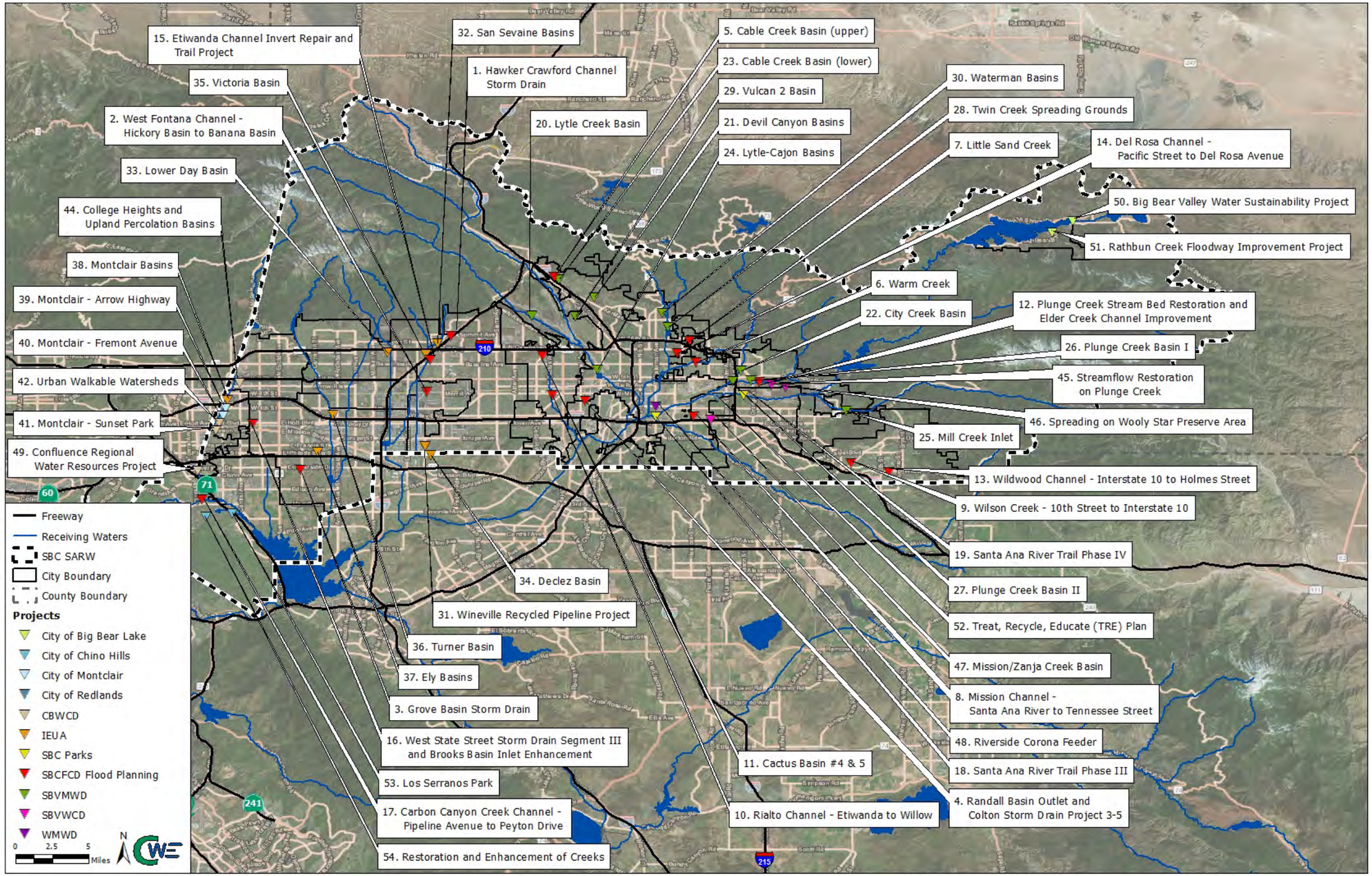


Figure 6-1 SWRP Projects

Table 6-1 SWRP Projects

Project Number	Project	Responsible Agency	Project Description
1	Hawker Crawford Channel Storm Drain	SBCFCD	An existing undersized trapezoidal channel cuts through a field and discharges into San Sevaine Basin No. 3, which has an infiltration rate of 0.5 feet per day. The proposed project will take flow into a box culvert sized to carry the 100-year flow rate and discharge into San Sevaine Basin No. 1, which has a higher infiltration rate (2.5 feet/day). The project will increase the stormwater and dry-weather runoff captured and infiltrated to the groundwater by 12 acre-feet per year.
2	West Fontana Channel - Hickory Basin to Banana Basin	SBCFCD	The existing undersized riprap-lined trapezoidal channel floods surrounding parcels during high return interval storm events. The proposed project will enlarge the channel to contain the 100-year storm event and add a bioswale to the north side that treats runoff from areas north of the channel.
3	Grove Basin Storm Drain	SBCFCD	Grove Basin has a gated outlet structure which is connected to a 66-inch Reinforced Concrete Pipe (RCP). This 66-inch RCP discharges onto Grove Avenue, causing street flooding, and the potentially polluted discharge eventually reaches Prado Park Lake. The proposed project will reroute the flows to a 108-inch RCP going eastward along Chino Avenue and discharge to Lower Cucamonga Spreading Grounds, allowing for additional groundwater infiltration.
4	Randall Basin Outlet and Colton Storm Drain Project 3-5	SBCFCD	Randall Basin is a flood control basin that can only discharge excess flows overland in an uncontrolled emergency spillway to Randall Avenue. The proposed project will allow Randall Basin to be managed as a recharge facility by including a control structure at the basin outlet and a new storm drain to the Santa Ana River.
5	Cable Creek Basin (Upper)	SBCFCD	Uncontrolled and unregulated flows from Cable Creek discharge to the Cajon Wash. The proposed project will create a new basin on Cable Creek upstream of Little League Drive in north San Bernardino. The basin will capture sediment and polluted runoff. The project will also provide a water supply benefit to the Bunker Hill groundwater basin through groundwater recharge.

Project Number	Project	Responsible Agency	Project Description
6.1	Warm Creek - Baseline Street to Sand Creek Confluence - Concept 1	SBCFCD	Warm Creek is an undersized earth-lined trapezoidal channel between Baseline Street and the improved confluence with Sand Creek. Warm Creek Concept 1 will increase the width of the channel, which will provide an increase in infiltration. The channel will be lined with riprap, and the velocity will be controlled by grouted riprap grade breaks. A trail is also proposed along a portion of the site, to be maintained by the Cities of San Bernardino and Highland.
6.2	Warm Creek - Del Rosa Confluence to Sand Creek Confluence - Concept 2	SBCFCD	Warm Creek Concept 2 will improve water quality by adding bioretention facilities on each side of the channel at locations where it is feasible to capture runoff from intersecting storm drains. Walls will separate the bioretention facilities from the flood control channel, and the channel will be deep enough to contain the entire 100-year flood flow. The project will incorporate a trail to be maintained by the Cities of San Bernardino and Highland.
7.1	Little Sand Creek - Concept 1	SBCFCD	Little Sand Creek is a channel with a riprap bottom and rail-and-wire revetment with sheet metal backing on the sides. Concept 1 will improve water quality and flood control with the incorporation of a bioretention facility to capture and treat stormwater flows entering from the north side of the channel. The bioretention facility will be separated from the improved flood control channel by a concrete wall.
7.2	Little Sand Creek - Concept 2	SBCFCD	Little Sand Creek Concept 2 will take advantage of publicly owned lands on the north side of the channel to improve water supply and water quality. A small basin will be constructed that will take diverted dry-weather runoff from Little Sand Creek for infiltration into the groundwater basin.
8	Mission Channel - Santa Ana River to Tennessee Street	SBCFCD	Mission Channel is an undersized earth and riprap trapezoidal channel that bisects a Disadvantaged Community (DAC) in eastern San Bernardino and western Redlands. The proposed project will benefit the community by adding a trail connecting the Santa Ana River Trail and the Orange Blossom Trail while upgrading the channel to be capable of carrying the 100-year storm event. The channel will continue to be an earthen channel, and the increased width will increase the volume of infiltration.

Project Number	Project	Responsible Agency	Project Description
9	Wilson Creek - 10th Street to Interstate 10	SBCFCD	Wilson Creek flows through west Yucaipa as a 60-foot wide channel with rail and wire revetment on the side slopes. The efficiency of infiltration from the earth-lined channel is less than optimal, as the channel is prone to scour and deposition, which alters the stream bed and constricts the spread of flows. The proposed project will improve infiltration efficiency, reduce scour, enhance the flood capacity, and improve the trail system along the channel.
10.1	Rialto Channel - Etiwanda to Willow - Concept 1	SBCFCD	Rialto Channel conveys urban stormwater and outflow from the Cactus Basins in an undersized earth and rock-lined trapezoidal channel. The proposed project concept will widen the channel to allow for more infiltration while deepening the channel to provide additional flood capacity. The project will also provide community benefits to a severely DAC within the City of Rialto through the creation of a multi-use trail to connect with the popular Pacific Electric Trail.
10.2	Rialto Channel - Etiwanda to Willow - Concept 2	SBCFCD	Rialto Channel Concept 2 will widen and deepen Rialto Channel to provide flood protection for surrounding residents and businesses. The concept will increase infiltration in the upper portion through Armorflex blocks, while the lower portion will convey flood flows through a concrete lined rectangular channel. The project will include a multi-use trail as mentioned above.
11	Cactus Basin #4 and 5	SBCFCD	Cactus Basin #4 and 5 will provide multiple beneficial uses for DACs in Rialto and the Inland Empire. The project will provide a large increase in the volume of stormwater captured to recharge groundwater. The project will enhance water quality by removing bacteria and other pollutants from downstream water bodies. The project will also protect thousands of structures from flooding.
12	Plunge Creek Stream Bed Restoration and Elder Creek Channel Improvement	SBCFCD	The Elder Creek/Plunge Creek confluence project, a continuation of SBVWCD's Plunge Creek restoration project, will rehabilitate the ecological function of the wash. The project will spread stormwater through braided channels to restore natural watershed processes, enhance groundwater recharge, and improve downstream water quality. The project will also improve Elder Gulch upstream of the confluence to reduce sedimentation and protect surrounding areas from flooding.

Project Number	Project	Responsible Agency	Project Description
13	Wildwood Channel - Interstate 10 to Holmes Street	SBCFCD	Wildwood Channel conveys flows in an undersized channel lined with sand and gravel. The proposed project will widen the channel to increase infiltration capacity and flood protection while providing grade breaks that will reduce velocities. The project will also enhance the existing multi-use trails in this DAC.
14.1	Del Rosa Channel - Pacific Street to Del Rosa Avenue - Concept 1	SBCFCD	Del Rosa Channel is an undersized rectangular channel with a riprap-lined bottom and rail-and-wire revetment on the sides. The limited amount of public right-of-way reduces the opportunities for additional enhancements. Concept 1 will widen the channel from 20 feet to 30 feet and deepen it to handle flood flows. The composition of the channel bottom will remain porous for infiltration. A new culvert will be required across Pacific Avenue.
14.2	Del Rosa Channel - Pacific Street to Del Rosa Avenue - Concept 2	SBCFCD	Del Rosa Channel Concept 2 will widen the channel without deepening it. The slopes will be protected with stair-stepped rock gabion walls, eliminating the need for permanent concrete structures within the channel right-of-way. Flooding will be reduced, but the channel will not be capable of carrying the 100-year flood. The existing culvert at Pacific Avenue will remain in place.
15	Etiwanda Channel Invert Repair and Trail Project	SBCFCD	Etiwanda Channel and San Sevaine Channel are two rectangular concrete channels laterally contiguous to one another separated by a channel wall. The channels are subject to scour issues. The proposed project will remove the wall between the channels, address the scouring issues, and provide a trail improvement benefiting the community as a part of the San Sevaine Trail Phase I Segment 2 in the City of Fontana.
16	West State Street Storm Drain Segment III and Brooks Basin Inlet Enhancement	SBCFCD	West State Street Storm Drain is an open channel that runs between West State Street and the Union Pacific Railroad in the Cities of Montclair and Ontario. The storm drain conveys runoff westward to San Antonio Creek Channel, but upstream of the confluence with San Antonio Creek Channel there is an inlet that diverts low flows into Brooks Basin. The project will enlarge the inlet and enhance the channel to provide flood protection and capture, convey, and divert more stormwater to Brooks Basin for infiltration (groundwater recharge).

Project Number	Project	Responsible Agency	Project Description
17	Carbon Canyon Creek Channel - Pipeline Avenue to Peyton Drive	SBCFCD	Carbon Canyon Creek Channel is a riprap-lined undersized trapezoidal channel between Pipeline Avenue and Peyton Drive. The proposed project will widen the channel, while maintaining a soft bottom. This design will increase flood protection and provide additional opportunity for stormwater flows to infiltrate and recharge groundwater.
18	Santa Ana River Trail Phase III	SBC Parks	Santa Ana River Trail Phase III will extend the popular public use trail from its current endpoint at Waterman Avenue in San Bernardino to California Street in Redlands. Stormwater improvements along the trail will be sized for the 100-year flood flow from future development conditions. The trail provides public use areas and green space for DACs.
19	Santa Ana River Trail Phase IV	SBC Parks	Santa Ana River Trail Phase IV will complete the trail to Garnet Street in Mentone. The project will include similar stormwater improvements as Phase III, provide public use areas, and enhance green space. The project will also feature interpretive signage as a public education component.
20	Lytle Creek Basin	SBVMWD	The proposed Lytle Creek Basin will be located in the City of Rialto east of Interstate 15, upstream of an existing CEMEX plant. The 60 acre site will capture unregulated flood flows from Lytle Creek and allow an estimated average of 4,023 acre-feet of stormwater per year to infiltrate and recharge the Bunker Hill groundwater subbasin.
21	Devil Canyon Basins	SBVMWD	The existing Devil Canyon Spreading Grounds diverts flow from Devil Creek during very high flow events. The proposed project would increase the capacity of the diversion through the construction of an inflatable armored dam across Devil Creek. Two new recharge cells will be constructed below the existing Basin No. 1, and the transfer structures between the existing basins will be improved. The improvements will allow an estimated average of 3,631 acre-feet of stormwater per year to infiltrate.

Project Number	Project	Responsible Agency	Project Description
22	City Creek Basin	SBVMWD	The series of nine proposed basins will be constructed along over a mile of City Creek on both sides of the 210 Freeway in the City of Highland. Infiltrated stormwater from the City Creek Basin project will recharge the Bunker Hill groundwater subbasin by an estimated average of 5,247 acre-feet per year. The basins will be connected at the downstream end to the proposed Plunge Basin II project, though the projects can be constructed independently of one another.
23	Cable Creek Basin (Lower)	SBVMWD	This Cable Creek Basin project will be located just downstream of the proposed SBCFCD Cable Creek Basin project (Project No. 5). Unlike the SBCFCD project, flow will be diverted into the lower Cable Creek Basin project from the main channel via an inflatable rubber dam. The Bunker Hill groundwater subbasin will be recharged by an estimated average of 2,978 acre-feet of stormwater per year as a result of this project.
24	Lytle-Cajon Basins	SBVMWD	The Lytle-Cajon Basins project will be located just upstream of the Lytle-Cajon Radial Gate and spillway. The proposed project will result in the construction of eight in-channel recharge basins. In total, the project will result in an estimated average of 3,408 acre-feet of additional infiltrated stormwater to recharge the Bunker Hill groundwater subbasin.
25	Mill Creek Inlet	SBVMWD	The Mill Creek Inlet project will improve the transfer of flow from Mill Creek into the existing series of percolation basins in the Mill Creek wash area. The capacity of the existing inlet will be increased from 110 cubic feet per second (cfs) to 210 cfs and involve the replacement of culverts underneath the existing flood control levee. The improvements will allow 196 acre-feet more stormwater to infiltrate per year.
26	Plunge Creek Basin I	SBVMWD	The Plunge Creek Basin I project will place a basin downstream of the SBVWCD and SBCFCD Plunge Creek Restoration Projects. The single cell basin will capture water using an inflatable rubber dam diversion across Plunge Creek, resulting in an increase in groundwater recharge of an estimated 2,481 acre-feet per year.

Project Number	Project	Responsible Agency	Project Description
27	Plunge Creek Basin II	SBVMWD	The Plunge Creek Basin II project will be located just upstream of the confluence of Plunge Creek and City Creek. The basin will receive flows from an inflatable dam placed across Plunge Creek. Groundwater recharge due to construction of the basin will be increased by approximately 1,050 acre-feet per year.
28	Twin Creek Spreading Grounds	SBVMWD	The existing Twin Creek Spreading Grounds are flow-through basins located within Twin Creek north of Lynwood Drive in the City of San Bernardino. Existing basins within the spreading grounds were originally built to attenuate flows, but over the years the basin walls have been eroded or purposely breached, allowing flows to pass through unobstructed. The proposed project will reconstruct and armor the basin walls, construct one new cell, and provide new transfer structures between the basin cells. These improvements will provide flood protection and groundwater infiltration benefits.
29	Vulcan 2 Basin	SBVMWD	The Vulcan 2 Basin project will improve groundwater recharge in a new basin located near the severely DAC of Muscoy. The project will divert flow from the Devil Creek Diversion Channel using an inflatable dam. The Vulcan 2 Basin will allow the diverted flow to infiltrate, recharging the Bunker Hill groundwater subbasin by an average of 3,441 acre-feet per year.
30	Waterman Basins	SBVMWD	The Waterman Basins project will improve the existing diversion structure at the Waterman Basins northeast of Waterman Avenue and 40th Street in the City of San Bernardino. The improvements will refurbish two existing radial gate systems and provide two new gates for a maximum diversion capacity of 1,000 cfs. Upon completion, Waterman Basins will put an estimated average of 1,675 more acre-feet of stormwater per year into the groundwater aquifer.

Project Number	Project	Responsible Agency	Project Description
31	Wineville Recycled Pipeline Project	IEUA	The Wineville Recycled Pipeline Project will make changes to three basins. The project will include upgrading Wineville Basin to be capable of infiltration by adding a gate to the outlet and improving the dam. Detained stormwater will be pumped to Jurupa Basin via a new pump and conveyance pipeline. Stormwater will then be pumped from Jurupa Basin through existing lines to the RP3 Basins, which will be enlarged and improved to accept more stormwater and recycled water. Combined, the upgrades will add over 6,500 acre-feet per year on average of stormwater and recycled water to the Chino groundwater subbasin.
32	San Sevaine Basins	IEUA	Recharge in the San Sevaine Basins will be increased by recycling water through a new pump and conveyance pipeline from San Sevaine Basin No. 5, which has a low infiltration rate, to San Sevaine Basin No. 3, which has a higher infiltration rate. A new berm will also be constructed within Basin No. 5. The improvements will facilitate additional groundwater recharge from both stormwater and recycled water.
33	Lower Day Basin	IEUA	The improvements proposed as part of the Lower Day Basin project include the construction of a secondary diversion structure within the channel to more efficiently divert flows into the basin. Within the basin, capacity will be increased by removing a mid-level outlet and reconstructing an embankment. These improvements will add an estimated average of 75 acre-feet of groundwater to the Chino groundwater subbasin per year.
34	Declez Basin	IEUA	Declez Basin will be improved by reconstructing the existing embankment and spillway at a higher elevation to increase storage. Additionally, a gate will be installed on an existing outlet, improving the ability of IEUA to manage the basin as a recharge facility. The improvements will recharge an average of 241 acre-feet of stormwater to the groundwater basin annually.

Project Number	Project	Responsible Agency	Project Description
35	Victoria Basin	IEUA	The Victoria Basin project will improve the recharge and flood control capabilities of the existing basin by abandoning the mid-level outlet that allows flows to discharge to the San Sevaine Channel. The basin's recharge capacity will be increased by blocking the outlet and extending the existing lysimeter stations, allowing the basin to hold a greater volume of water.
36	Turner Basin	IEUA	The existing spillway at Turner 2 Basin was built long before upstream development in the City of Rancho Cucamonga required larger stormwater basins at the confluence of Cucamonga Channel and Deer Creek Channel, and it is one of the last remaining pieces of the Turner Basin complex that has yet to be replaced. A new spillway at a higher elevation will allow IEUA to store additional stormwater volume within the basin complex, which will produce an additional annual recharge volume of 66 acre-feet.
37	Ely Basins	IEUA	The Ely Basins improvements include excavating 470,000 cubic yards of material from within the existing footprint of the basins. IEUA estimates that the increase in the capacity of the basins would yield an average of 221 acre-feet of additional stormwater recharge per year.
38	Montclair Basins	IEUA	The proposed project at Montclair Basin will add one drop inlet structure from Basin 1 to Basin 2, and one drop inlet structure from Basin 2 to Basin 3. The project will allow for better management of groundwater recharge and the efficiencies attained will yield an average of 248 acre-feet of additional recharge per year.
39	Montclair - Arrow Highway	City of Montclair	This project will reduce the current four lane major arterial street to a two lane road, allowing for a median that will capture runoff from the street, treat it, and infiltrate it back into the ground.
40	Montclair - Fremont Avenue	City of Montclair	This project will reduce the current four lane arterial street to a two lane road, allowing for a median that will capture runoff from the street, treat it, and infiltrate it back into the ground.
41	Montclair - Sunset Park	CBWCD / Montclair	This project will develop a walking and biking environmental trail that incorporates a water feature moving dry-weather runoff on Orchard Street from the north end of the park to the south end where it will infiltrate into the ground.

Project Number	Project	Responsible Agency	Project Description
42	Urban Walkable Watersheds	CBWCD	The Urban Walkable Watersheds project will feature a community walking trail that provides connectivity near water infrastructure projects while actively capturing and infiltrating runoff through green infrastructure demonstration projects. An emphasis will be placed on increasing public education and community involvement through educational programs involving nearby public schools.
43	Multipurpose Recharge Basins	CBWCD	The Multipurpose Recharge Basins project will re-conceptualize the role of groundwater recharge basins by integrating native plant restoration and passive recreation with educational signage on perimeters of existing basins. The project will increase areas for public education and recreation without impeding groundwater recharge in the basin.
44	College Heights and Upland Percolation Basins	CBWCD	The improvements proposed to the College Heights and Upland Percolation Basins will include water quality features to improve urban runoff, flood mitigation, streetscape, passive recreation, and education.
45	Streamflow Restoration on Plunge Creek	SBVWCD	The Streamflow Restoration on Plunge Creek will continue the enhancement of the SBVWCD Plunge Creek Conservation Project by an additional half mile. In addition to providing riparian habitat, the stream enhancements will improve flood management capacity during high flow events.
46	Spreading on Woolly Star Preserve Area	SBVWCD	The Spreading on Wooly Star Preserve Area project involves spreading Santa Ana River water within the preserve area during events of high flow through the installation of new gates and pipes. Stormwater infiltration will occur in historical remnant channels to better mimic pre-development processes, which will enhance riparian habitat.
47	Mission/Zanja Basin	SBVWCD	The Mission/Zanja Groundwater Recharge Basin project will place a groundwater recharge basin in vacant lands along the Mission Zanja, reducing stormwater runoff and increasing groundwater recharge. Seven possible locations have been identified with the smallest being 65,000 square feet with a recharge rate of 10 feet per day. Up to 15 acre-feet will recharge per day at a flow rate of 7.5 cfs.

Project Number	Project	Responsible Agency	Project Description
48	Riverside Corona Feeder	WMWD	The project will connect the California State Water Project feeder to Riverside. California State Water Project water will be used to recharge Riverside County basins.
49	Confluence Regional Water Resources Project	CBWCD	The project will construct a new groundwater recharge and storage reservoir at the confluence of Chino Creek and San Antonio Creek. Pumps will send excess stormwater to upstream CBWCD-managed basins to enhance recharge opportunities. An artificial habitat and bioremediation channel will be used as an educational and wetland habitat feature.
50	Big Bear Valley Water Sustainability Project	City of Big Bear Lake	Big Bear Valley wastewater currently is treated and sent outside of the SARW to irrigate crops in Lucerne Valley. The project will upgrade the Wastewater Treatment Plant (WWTP) and reuse tertiary-treated wastewater locally to recharge local groundwater, provide critical habitat for endangered species, and stabilize BBL water levels.
51	Rathbun Creek Floodway Improvement Project	City of Big Bear Lake	The project will increase the size of three culverts on Rathbun Creek to be able to convey the 100-year discharge without flooding nearby properties. The project will also enhance the natural streambed downstream of Big Bear Boulevard and riparian habitat. A multiuse trail will be constructed along the banks to extend Rathbun Trail all the way to Big Bear Lake.
52	Treat, Recycle, Educate (TRE) Plan	City of Redlands	The TRE Plan consists of several green street improvements combined with a new 0.8-acre stormwater basin near the existing Redlands WWTP. The area will include a new educational park featuring interpretive signage describing the LID BMPs that will be included in the park and on Nevada Street. The park's vegetation will be irrigated with recycled water from the WWTP.
53	Los Serranos Park	City of Chino Hills	The Los Serranos Park project will create a new community park in the City of Chino Hills. The design will include green infrastructure and habitat enhancement and protection.
54	Restoration and Enhancement of Creeks	City of Chino Hills	This project will improve the ecosystem and protect valuable riparian habitat through a creek rehabilitation and streambed restoration project. The project will also provide public walking trails and educational opportunities.

6.2 Benefit Analysis Results

Each project was evaluated for its capacity to maximize water supply, water quality, flood management, environmental, and other community benefits within the watershed. The benefits were analyzed based

on the quantitative methods approach described in **Section 5.3**. A summary of this analysis is included in **Attachment G**.

6.3 Project Prioritization

The projects listed in **Section 6.1** were assigned a ranking code according to the methodology described in **Section 5.4**. The ranking takes into account an integration of quantitative factors, including the project readiness, cost, breadth of benefits, water supply efficiency, and water quality efficiency, to assure the greatest needs are addressed. A summary of the result of this analysis are included in **Attachment H**. While each of the projects is considered a priority, this analysis helps determine which projects may be most ready and beneficial from a SWRP perspective.

6.4 Assessment of Stormwater Management Objectives

Five stormwater management goals were identified in **Section 1.5** as follows:

1. Enhance water quality
2. Maximize water supply
3. Improve flood management
4. Protect the environment
5. Provide community benefits

Eighteen stormwater management objectives were identified in accordance with these goals, as further discussed in sections above and for which the quantitative approach is included in **Section 5.3**. **Table 6-2** identifies the degree to which these stormwater management objectives will be satisfied through the construction of all projects identified in **Section 6.1**. It is unlikely that all projects will be constructed and overall implementation will span over multiple decades. Conditions will change over time and those changes are not accounted for in this analysis. The assessment included below provides a context to the magnitude of benefits proposed through this SWRP.

Table 6-2 Assessment of Stormwater Management Objectives

Goal	Objective	Predicted Cumulative Achievement
Enhance Water Quality	Pollutant Load Reduction	The projects will cumulatively provide for the removal of roughly **four quadrillion (4 x 10^{15}) MPN *E. coli* bacteria** from the waterways of the SBC SARW per year.
	Stormwater Runoff Reduction	The projects will reduce the discharge of untreated stormwater by approximately **41,000 acre-feet** per year.
Maximize Water Supply	Stormwater Recharge	The projects in the SWRP will cumulatively capture on average around **41,000 acre-feet** of stormwater per year and use the volume to recharge local aquifers.
	Recycled Water Recharge	The projects will also capture about **7,500 acre-feet** of recycled water per year for groundwater recharge.

Goal	Objective	Predicted Cumulative Achievement
Improve Flood Management	Runoff Rate Reduction	At least 32 projects will provide a benefit of reducing the peak flow rate during floods, with a maximum predicted flow rate reduction of **600 cfs** (Cactus Basin #4 and 5).
	Runoff Volume Reduction	The projects will cumulatively prevent **41,000 acre-feet** of stormwater from reaching downstream flood-prone areas.
	Flood Elevation Reduction	At least 17 projects will provide a benefit of reducing the water surface elevation during a flood event, with a maximum predicted flood elevation reduction of almost **9 feet** (Wilson Creek – 10th Street to Interstate 10).
	Removal of Parcels/ Structures from the Floodplain	The projects will cumulatively remove approximately **1,900 parcels** from the risk of flooding during a 100-year storm event.
	Property Value Saved	These parcels have a combined value of over **$610 million.**
Protect the Environment	Wetlands Enhancement/ Creation	The projects will enhance or create over **148 acres** of wetlands.
	Riparian Area Enhancement	The projects in the SWRP will restore or enhance almost **178 acres** of riparian habitat.
	Streambed Restoration	The projects in the SWRP will restore at least **4,545 feet** of streambed to natural conditions, creating and preserving critical habitat for endangered species.
	Increased Urban Green Space	Cumulatively, the projects will increase the amount of urban green space within the SBC SARW by about **78 acres**.
Provide Community Benefits	Provide Employment Opportunities	Construction of the projects in the SWRP is estimated to provide roughly **6,100 job-years** of employment opportunities to the community. From the Bureau of Labor Statistics, the median tenure of an employee in a construction job in 2016 was 4 years (BLS, 2016). Therefore, it is estimated that the projects will cumulatively provide over **1,500 new jobs**.
	Increase Public Education	Public education benefits will be achieved in at least **eight projects**. These projects will have interpretive signage to increase the public's understanding of water quality protection and using stormwater as a resource.
	Increase Community Involvement	At least **five projects** in the SWRP will increase community involvement as a permanent feature of the project.
	Recreational Paths Enhancement/ Creation	The projects in the SWRP will create or enhance over **29 miles** of multi-use paths and trails for public use.
	Public Use Area Enhancement/ Creation	Over **75 acres** of new public use and recreational space will be created by the construction of the projects.

7. Implementation Strategy and Schedule

This section presents elements of the implementation strategy that will be used to implement projects and programs identified in the SBC SARW SWRP. The strategy includes implementation elements, resources, performance-measures, and an adaptive management approach. This section also discusses the use of decision support tools to support ongoing implementation and adaptation.

7.1 Implementation Approach

Figure 7-1 illustrates the overall implementation strategy. The four major components of the implementation strategy are resources, implementation, adaptive management, and performance measures. These components are further detailed in the sections below.

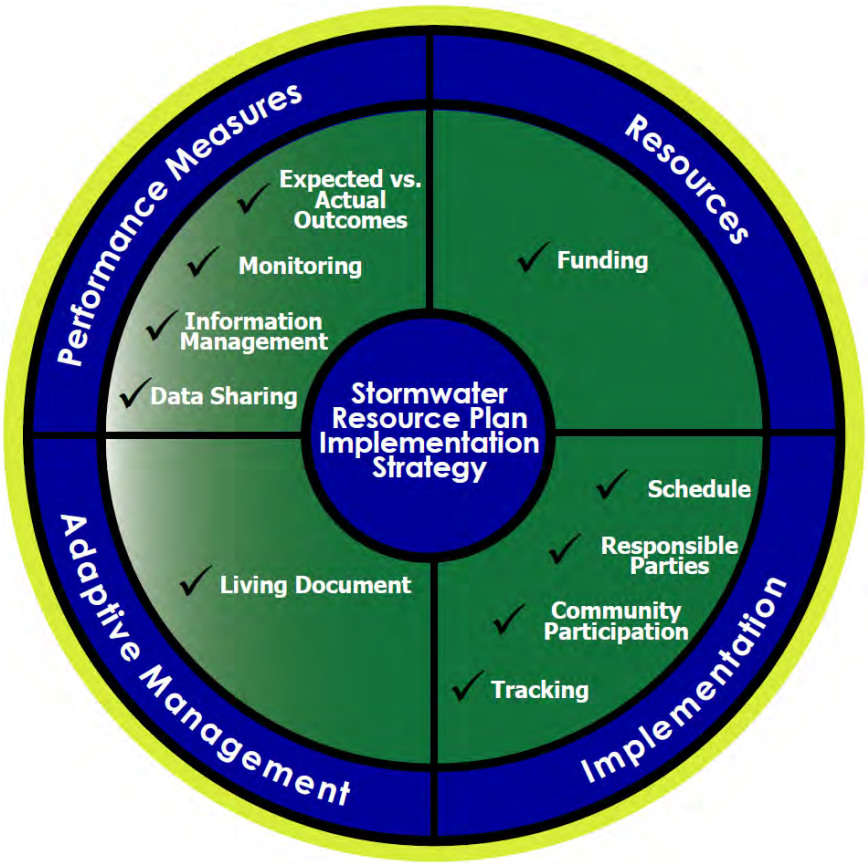


Figure 7-1 Overall Implementation Strategy

7.2 Resources

Financial resources are a significant component of SWRP implementation. A matrix of funding opportunities is included in **Attachment I**, summarizing various financing programs (grants and loans). The matrix included in the attachment identifies the funding agency, program, timeline, purpose, eligible uses, funding limits, contact information, and website link. Funding programs will change over time. The attached matrix summarizes programs that are currently relevant, which may also be relevant in the

future. The cost estimates included in **Attachment H** represent the currently projected funding needs on a project by project basis (if available). The responsible agency for each project would ultimately be responsible for identifying and securing funding according to the financing program schedule and/or the implementation schedule if the implementing agency's funds are utilized.

7.3 Implementation

The general implementation strategy includes several elements, including schedule, responsible parties, community participation, and tracking, which are further detailed below. The schedule for implementation is discussed in **Section 7.3.1**. The party responsible for each project will dictate specific details regarding implementation. This information is discussed in **Section 7.3.2**. Community involvement (**Section 7.3.3**) is a key component, as the SWRP is a regional planning document that is most effective when stakeholders and the public are involved. Project/program implementation tracking (**Section 7.3.4**) will be important to measure progress from the planning phase through operation. The elements described in this section will also be considered through the adaptive management process.

7.3.1 Schedule

This section discusses the schedule associated with finalizing the SWRP along with the scheduling of the projects identified through the SWRP development process. This SWRP will be submitted to SAWPA (the local IRWM group) upon finalization, as required based on the SWRP Guidelines (SWRCB, 2015). **Table 7-1** summarizes the typical schedule related to implementation of various size projects. It is assumed that all outreach related activities would occur during the planning/design and construction phases. The schedule noted in the table below does not take into account the time needed to obtain necessary federal, state, and local permits. The obtainment of permits can vary by project and can range from a few months to several years.

Table 7-1 Typical Project Schedule

Phase	Percent Complete				
	Year 1	Year 2	Year 3	Year 4	Year 5
Green Streets (Under $1 Million for Construction)					
Agency planning and design	100%	-	-	-	-
Consultant planning and design	100%	-	-	-	-
Construction	-	100%	-	-	-
Agency construction management	-	100%	-	-	-
Consultant construction management	-	100%	-	-	-
Small/Medium Projects (Under $10 Million for Construction)					
Agency planning and design	100%	-	-	-	-
Consultant planning and design	50%	50%	-	-	-
Construction	-	25%	75%	-	-
Agency construction management	-	25%	75%	-	-
Consultant construction management	-	25%	75%	-	-
Large Projects (Over $10 Million for Construction)					
Agency planning and design	100%	-	-	-	-
Consultant planning and design	25%	50%	25%	-	-

Phase	Percent Complete				
	Year 1	Year 2	Year 3	Year 4	Year 5
Construction	-	-	25%	50%	25%
Agency construction management			25%	50%	25%
Consultant construction management			25%	50%	25%

The schedules for each individual project will vary based on the needs of the project, the funding available, and other unforeseeable circumstances, and thus it is unknown when exactly projects will begin in most cases. A rough estimate of the date when construction will start for each project is listed below. These dates are tentative and subject to change for a variety of reasons.

Year 1 = 2018

11. Cactus Basin #4 and 5 (SBCFCD)
15. Etiwanda Channel Invert Repair and Trail Project (SBCFCD)
16. West State Street Storm Drain Segment III and Brooks Basin Inlet Enhancement (SBCFCD)
18. Santa Ana River Trail Phase III (SBC Parks)
32. San Sevaine Basins (IEUA)
33. Lower Day Basin (IEUA)
49. Confluence Regional Water Resources Project (CBWCD)

Year 1 = 2019

2. West Fontana Channel – Hickory Basin to Banana Basin (SBCFCD)
12. Plunge Creek Stream Bed Restoration and Elder Creek Channel Improvement (SBCFCD)
31. Wineville Recycled Pipeline Project (IEUA)
34. Declez Basin (IEUA)
35. Victoria Basin (IEUA)
36. Turner Basin (IEUA)
37. Ely Basins (IEUA)
38. Montclair Basins (IEUA)
53. Los Serranos Park
54. Restoration and Enhancement of Creeks

Year 1 = 2020

3. Grove Basin Storm Drain (SBCFCD)
50. Big Bear Valley Water Sustainability Project (City of Big Bear Lake)
51. Rathbun Creek Floodway Improvement Project (City of Big Bear Lake)

Year 1 = 2021

1. Hawker Crawford Channel Storm Drain (SBCFCD)
17. Carbon Canyon Creek Channel – Pipeline Avenue to Peyton Drive (SBCFCD)

Year 1 = 2022

19. Santa Ana River Trail Phase IV (SBC Parks)

Year 1 = 2023 or beyond

4. Randall Basin Outlet and Colton Storm Drain Project 3-5 (SBCFCD)
5. Cable Creek Basin (Upper) (SBCFCD)
6.1 Warm Creek – Baseline Street to Sand Creek Confluence – Concept 1 (SBCFCD)
6.2 Warm Creek – Del Rosa Confluence to Sand Creek Confluence – Concept 2 (SBCFCD)
7.1 Little Sand Creek – Concept 1 (SBCFCD)
7.2 Little Sand Creek – Concept 2 (SBCFCD)
8. Mission Channel – Santa Ana River to Tennessee Street (SBCFCD)
9. Wilson Creek – 10th Street to Interstate 10 (SBCFCD)
10.1 Rialto Channel – Etiwanda to Willow – Concept 1 (SBCFCD)
10.2 Rialto Channel – Etiwanda to Willow – Concept 2 (SBCFCD)
13. Wildwood Channel – Interstate 10 to Holmes Street (SBCFCD)
14.1 Del Rosa Channel – Pacific Street to Del Rosa Avenue – Concept 1 (SBCFCD)
14.2 Del Rosa Channel – Pacific Street to Del Rosa Avenue – Concept 2 (SBCFCD)
20. Lytle Creek Basin (SBVMWD)
21. Devil Canyon Basins (SBVMWD)
22. City Creek Basin (SBVMWD)
23. Cable Creek Basin (Lower) (SBVMWD)
24. Lytle-Cajon Basins (SBVMWD)
25. Mill Creek Inlet (SBVMWD)
26. Plunge Creek Basin I (SBVMWD)
27. Plunge Creek Basin II (SBVMWD)
28. Twin Creek Spreading Grounds (SBVMWD)
29. Vulcan 2 Basin (SBVMWD)
30. Waterman Basins (SBVMWD)
39. Montclair – Arrow Highway (City of Montclair)
40. Montclair – Fremont Avenue (City of Montclair)
41. Montclair – Sunset Park (CBWCD / City of Montclair)
42. Urban Walkable Watersheds (CBWCD)
43. Multipurpose Recharge Basins (CBWCD)
44. College Heights and Upland Percolation Basins (CBWCD)
45. Streamflow Restoration on Plunge Creek (SBVWCD)
46. Spreading on Woolly Star Preserve Area (SBVWCD)
47. Mission/Zanja Basin (SBVWCD)
48. Riverside Corona Feeder (WMWD)
52. Treat, Recycle, Educate (TRE) Plan (City of Redlands)

7.3.2 Responsible Parties

A lead agency has been identified for each of the projects evaluated, as defined in **Table 6-1**. The responsible agency is the agency that submitted the project information for inclusion in the SWRP. In several cases, the lead agency will partner with other agencies. For example, the SBCFCD has identified

several projects that may include trail features. Those trail features will be established through a partnership with local jurisdictions.

There are not any critical linkages between projects, such that there is not any given project that must be implemented prior to another. Several of the projects are related due to their location within the same subwatershed; therefore, implementation of one project may impact performance of another, but will not mitigate the need for the other project. The project concepts identified in the SWRP are based on full implementation. In some cases multiple alternatives have been identified and in that case only one concept will be implemented. The lead agency may determine it is best to phase the projects, which would essentially create interdependence among the phases. Due to the independence of each project, the lead agency will be responsible for the overall implementation and utilize partners as appropriate.

7.3.3 Community Participation

The stakeholders/public supported the development of the SWRP through the TAC and outreach events, described further in **Section 4 and 8**. Community participation is consistent with the SPOEEP, included in **Attachment E**. The efforts made during the SWRP development to involve stakeholders and the public will transition into a platform for stakeholder/public input during implementation. Involvement during implementation will likely focus on the direct community in which the project is being implemented. Meetings and/or workshops will be executed as necessary in an effort to inform the community of multi-benefit project implementation and seek input as appropriate.

In addition to the involvement during the design and construction process of project implementation, the stakeholders/public may be engaged following the completion of projects when educational signage is incorporated. The community will learn about the multiple benefits the project provides and stormwater quality through the signage included as part of the projects. Stakeholder/public input may also be solicited during the design process with regard to the proposed educational signage.

7.3.4 Tracking

Project implementation is the most significant SWRP element for which tracking is applicable. Preliminary information regarding project status has been collected and documented as part of the SWRP development. The project prioritization in **Attachment H** identifies whether conceptual design plans have been prepared, as well as a cost estimate, for each of the projects included in the SWRP. The status of required studies, reports, investigations, and design plans may be tracked independently by each of the parties responsible for implementation. Tracking this information is helpful, as it may assist the responsible agency and/or their partners with prioritizing implementation efforts. Centralized tracking was considered and determined not to be the best approach at this time. A centralized tracking system will be reconsidered in the future and would be incorporated into the SWRP through the adaptive management process described below if deemed appropriate at that time. Each responsible party will track the status of applicable design elements for each of their projects independently, which may include, but is not limited to:

- Conceptual plans
- Preliminary design report
- Soils investigation

- Hydrology and hydraulic study
- Topographic survey
- Flood study
- Design plans

7.4 Adaptive Management

The SBC SARW SWRP is structured as a living document and will be adaptively managed. The SWRP will be reviewed approximately every five years to determine if an update is warranted. Adaptive management will allow the SWRP to be updated with the most pertinent and relevant information, which changes over time. For example, ongoing monitoring may demonstrate water quality improvements over time. In that instance, the SWRP could be updated to re-establish the water quality priorities. The utilization of monitoring data as part of the adaptive management process is further discussed in **Section 7.5**. Ongoing adaptations to the SWRP may include, but are not limited to:

- Re-characterization of water quality priorities
- Source assessment re-evaluation
- Effectiveness assessment of watershed-based projects
- Updated metrics-based quantitative analysis
- Deleted or new projects
- Identification of completed projects

Projects may be submitted to the SBCFCD by local lead agencies on an ongoing basis. The Multi-Benefit Project Request Form originally used to collect project information from stakeholders is included in **Attachment J**. This form may be submitted to the SBCFCD at any time and the SBCFCD will incorporate projects into the SWRP as appropriate. If a project concept has changed, the responsible agency would be required to submit the updated information to the SBCFCD. Updated information would also need to be submitted if the quantified benefits are determined to be different than those presented in the SWRP due to additional data collection and/or detailed analyses. It will be noted in the SWRP when a project originally identified in the SWRP has been implemented during periodic updates.

7.5 Performance Measures

This section discusses how performance of identified projects will be measured to assess the achievement of projected benefits. The following components will be used to assess performance and are further described below:

- Evaluation of expected versus actual outcomes, which leads to the re-evaluation of project objectives, priorities, and goals
- Monitoring and information management systems used to gather performance data
- Mechanisms to adapt project operations and plan implementation based on performance data
- Approach to document and share performance data with stakeholders

7.5.1 Expected versus Actual Outcomes

The quantification of multiple benefits presented in **Attachment G** represents a preliminary evaluation of the expected outcome due to project implementation. Project concepts assessed are preliminary, and benefits will be updated as the designs are finalized by the responsible parties. Projects that receive funding through grants are typically required to measure performance over time and are designed to achieve a benefit agreed upon between the responsible party and the granting agency. Benefits have been quantified within the five benefit categories (water quality, water supply, flood management, environmental, and community) through the SWRP development.

Table 7-2 summarizes design elements and/or technical analyses that may be necessary to measure actual outcomes/multiple benefits based on the benefit category following project implementation. The elements/analyses identified will need to be tailored for each project to establish an economical approach. For example, measuring flow rates/volumes into a basin can be done easily using a flow meter on the inflow pipe, while for a channel improvement, installing flow meters at every inlet (to assess infiltration within the channel) would be extremely costly and a detailed analysis may represent a more economical approach. Additional details pertaining to the benefits are included in **Section 5.3**.

Table 7-2 Options for Measuring Actual Outcomes by Benefit Category

Benefit	Design Elements/Analysis Options to Verify Performance
Water Quality	
Pollutant load reduction	➢ Visual flow monitoring ➢ Flow meter(s)/stream gage(s) ➢ Monitoring program (pre-/post-project and/or upstream/downstream) ➢ Monitoring with lysimeters (if applicable) ➢ Hydrologic modeling with collected rainfall data ➢ Infiltration testing to support calculations
Stormwater runoff reduction	➢ Visual flow monitoring ➢ Flow meter(s)/stream gage(s) ➢ Hydrologic modeling with collected rainfall data ➢ Infiltration testing to support calculations
Water Supply	
Stormwater recharge	➢ Visual flow monitoring ➢ Flow meter(s)/stream gage(s) ➢ Hydrologic modeling with collected rainfall data ➢ Infiltration testing to support calculations
Recycled water recharge	➢ Recycled water discharge rates/quantities ▪ Flow meter, visual monitoring, and/or collect data from others ➢ Flow rate/quantity captured ▪ Flow meter and/or visual monitoring ➢ Assessment of recycled water capture versus stormwater captured (unless project exclusively captures recycled water)
Flood Management	
Runoff rate reduction	➢ Model existing and proposed conditions hydrology and hydraulics and compare results ➢ Prepare Letter of Map Revision (LOMR) (if applicable)

Benefit	Design Elements/Analysis Options to Verify Performance
Runoff volume reduction	➢ Visual flow monitoring ➢ Flow meter(s)/stream gage(s) ➢ Hydrologic modeling with collected rainfall data ➢ Infiltration testing to support calculations
Flood elevation reduction	➢ Model existing and proposed conditions hydrology and hydraulics and compare results ➢ Prepare LOMR (if applicable)
Removal of parcels/structures from the 100-year floodplain	➢ Model existing and proposed conditions hydrology and hydraulics and compare results to identify change in floodplain limits ➢ Identify structures/parcels removed ➢ Prepare LOMR (if applicable)
Property value saved	➢ Model existing and proposed conditions hydrology and hydraulics and compare results to identify properties saved ➢ Update current market prices for properties removed from the floodplain to quantify property value saved
Environmental	
Wetlands enhancement/creation	➢ Measure area based on design plans/implementation ➢ Visual monitoring/photo documentation of enhancement
Riparian area enhancement	➢ Measure area based on design plans/implementation ➢ Visual monitoring/photo documentation of enhancement
Streambed restoration	➢ Measure length based on design plans/implementation ➢ Visual monitoring/photo documentation of restored streambed
Increased urban green space	➢ Measure area based on design plans/implementation ➢ Visual monitoring/photo documentation of urban green space type and how it is utilized by the community
Community	
Provide employment opportunities	➢ Data collection from all involved partners related to employment ➢ Collection of timesheets during design, construction, and ongoing implementation (as applicable)
Increase public education	➢ Count number of interpretive signs installed ➢ Photo documentation of signage and use ➢ Public surveys
Increase community involvement	➢ Track number of community meetings held ➢ Compile and analyze data/outcomes pertaining to each meeting (number of attendees, who attended, presentation, comments, action items, etc.)
Walking paths, sidewalks, and bike trails enhancement/creation	➢ Measure feature lengths based on design plans/implementation ➢ Photo documentation of paths, sidewalks, and/or bike trails (implementation and ongoing use)
Public use areas enhancement/creation	➢ Measure public use areas based on design plans/implementation ➢ Photo documentation (implementation and ongoing use)

Project objectives, priorities, and goals may be re-evaluated once actual outcomes are quantified. At that time, the future implementation strategies may be modified, as necessary and feasible, to align with objectives, priorities, and goals, which may be adapting and changing. These re-evaluations and assessments would be part of the adaptive management process described under **Section 7.4**.

7.5.2 Monitoring

This section is broken into two separate monitoring discussions; the first one is regional monitoring that is conducted currently to assess water quality on a regional level, and the second is individual project monitoring that may be implemented following project implementation. Results from both of these monitoring programs may be used to assess performance of either a specific project or the overall program. Project specific monitoring may include information management systems, such as flow monitoring, which will also produce data that can be used to assess performance.

7.5.2.1 Regional Water Quality Monitoring

Section 3.3 details the monitoring programs implemented in the last ten years along with the results of those monitoring efforts, specifically pertaining to:

- Core Monitoring
- BBLN TMDL Monitoring:
  - BBL Watershed-Wide Nutrient Monitoring
  - BBL In-Lake Monitoring
- MSAR Bacterial Indicator TMDL/WLA Monitoring

The SBC Areawide Stormwater Monitoring Programs are implemented to fulfill the MS4 Permit requirements. Implementation is currently ongoing and the monitoring programs will be modified as required by future MS4 Permits. The data collected through these monitoring efforts was used to quantify anticipated pollutant load reductions associated with project implementation. Through the adaptive management process, further detailed in **Section 7.4**, future monitoring data will be used to verify the characterization of water quality.

In early November of each year, the SBC Areawide Stormwater Annual Report is completed for the previous fiscal year, which includes a summary of the findings from the various monitoring programs. These reports are available for stakeholders to review and are reviewed by the SARWQCB. The transparent reporting process allows for data to be reviewed and gaps to be identified if they exist. Implementation of the SBC SARW SWRP does not require additional regional monitoring to be conducted. Monitoring may be conducted on a project by project basis, as further discussed below.

The findings related to regional water quality may provide insight as to how implemented programs are influencing the quality of water reaching downstream receiving waters. This assessment may be relevant to SWRP implementation in the future, once SWRP projects have been implemented. Findings from these ongoing monitoring efforts may influence future implementation and project prioritization (through the adaptive management process).

7.5.2.2 Project Specific Monitoring

Various types of monitoring may be implemented for individual projects. Monitoring may include flow monitoring (visual versus automatic) and/or water quality monitoring. Individual project monitoring is likely to occur when grant funds are received in which monitoring is required to assess performance. The monitoring scope and frequency will likely vary on a project by project basis. Individual project

monitoring data will allow the responsible party to assess project performance and compare expected and actual outcomes. This data may also be used to make projections on regional water quality improvements due to project implementation.

Monitoring data collected as part of a grant funded project will be summarized and reported to the grant manager. This data may also be shared with the public and/or stakeholders through a public input process or on the SWRP website. Sharing the monitoring data and findings with the granting agency, public, and/or stakeholders will promote a multi-faceted review process in which data gaps would be identified and an approach to fill those gaps could be developed as necessary.

7.5.3 Information Management

Information will be managed such that project operations and SWRP implementation may be adjusted based on performance data collected. How information will be stored and shared is further discussed under the following subsection, while this subsection focuses on how the information will be used to guide future operations and decisions. For instance, monitoring data (flow and/or water quality) may demonstrate that the originally projected targets are not being achieved. Some projects that involve controls (pumps, valves, etc.) may be modified to maximize the benefits achieved by a project; however, most of the projects identified in the SBC SARW SWRP cannot be easily modified once implemented. Potential project enhancements may be evaluated if critical goals are not achieved. Alternatively, if a project is exceeding the projected benefits at a high operational cost, then the project operations may be altered such that the projected benefits are achieved in a more economical way.

On a larger scale, regional monitoring data may be used to guide project/program implementation. For example, if several projects are implemented within a watershed tributary to a regional monitoring site and it is observed that water quality improves once the projects are implemented, then there may be opportunities to re-prioritize project implementation. In that case, projects within other watersheds that have water quality concerns may become a higher priority over those that would continue to improve the same watershed. Another example is that if one project helps relieve flooding in a given area, then another project to address that flooding may become a lesser priority. Projects may be re-prioritized following implementation of another project with similar benefits in the same subwatershed through the adaptive management process.

Project specific data collected through monitoring activities and/or information management systems will be managed by the responsible parties in accordance with any agreements they have in place with other involved parties (funding parties and/or project teaming partners). This data will be shared with the SBCFCD such that it may be considered when the SWRP is adaptively managed. Data collected from individual project implementation and regional monitoring will be compiled as part of the adaptive management process to determine how the program needs to be modified, likely through project re-prioritization.

The SWRP and identified projects will be submitted to and included in the latest version of the SAWPA OWOW Plan. Each project included in the SWRP and funded through an IRWM grant program will be required to provide data from approved project performance monitoring programs in formats consistent with the requirements of existing statewide databases such as the California Surface Water Ambient Monitoring Program (SWAMP), the California Environmental Data Exchange Network (CEDEN), the California Rapid Assessment Methods (CRAM) for wetland and riparian habitat conditions, and groundwater quality monitoring through the GeoTracker database, per the requirements of the OWOW

Plan. The OWOW Plan also encourages projects from the SWRP that are not funded through IRWM grant programs to upload data to the SAWPA Plan Performance Assessment Database. This database is reviewed by SAWPA staff, who will identify gaps in the data, correct erroneous data, and perform frequent backups on the database.

7.5.4 Data Sharing

Performance data collected will be made available to interested parties through various platforms. Separate reporting documents will be prepared summarizing data collection and results based on the type of monitoring/data collection. For example, annual reports (and/or other regularly scheduled reports, i.e., quarterly, seasonal, etc.) are prepared for all of the regional monitoring efforts. Additionally, an Areawide Stormwater Program Annual Report is prepared, as referenced in **Section 7.5.2.1**, that summarizes the individual regional monitoring program reports. Project specific monitoring will likely include periodic reports for internal use and/or for other involved parties. Data will be assessed and reviewed through report preparation and also by the SBCFCD through the SWRP adaptive management process. Gaps will be filled as identified and appropriate.

Through these reports, the public and interested stakeholders have access to the information collected. Stakeholders and/or the public may request regional monitoring data from the SBCFCD, while some of the monitoring reports are posted directly online on their respective websites. Specific project data will be shared as appropriate by the responsible party upon consent from all teaming partners. The SBCFCD will also evaluate opportunities to post data on the SWRP website and send email blasts to stakeholders and the public whom have been involved in outreach efforts.

The data submitted to statewide databases or through the SAWPA Plan Performance Assessment Database will be available through web tools and data requests. These data sharing tools have been developed to give stakeholders the ability to perform watershed-wide analysis and may be used to influence the goals of future plan revisions.

7.6 Decision Support Tools

The projects identified in the SWRP undergo a detailed quantitative assessment to understand the multiple benefits the given project provides. The results from the quantitative analysis and prioritization become an important tool that will be used to make decisions, such as how and when to implement the project. The approach to perform the quantitative analysis and results are included in **Section 5** and **Section 6**. Analyses performed and documentation prepared/reviewed during project implementation will also support decision making.

Decision support tools will be used in the implementation phase of the SWRP to determine progress toward meeting the goals and objectives specified in this SWRP and to determine project priorities for future iterations of the SWRP. Decision support tools will be consistent with the requirements of the SAWPA OWOW Plan, as the SBC SARW SWRP will be submitted to and approved by the local IRWM group that manages the OWOW Plan (SAWPA). The OWOW Plan calls for project proponents to collect data and submit it through database systems that have been developed for statewide efforts, such as the CEDEN and SWAMP databases, or through the SAWPA Plan Performance Assessment Database.

Updates to the watershed goals and objectives will occur whenever the OWOW Plan is updated. The OWOW Plan has been updated several times to evolve with the changing objectives of the SARW, and will be updated in the future. The OWOW Plan is a planning document with a 20-year horizon, and the needs of the watershed will require reassessment of the goals and objectives at the end of that time horizon at the very latest.

8. Education, Outreach, and Public Participation

Stakeholders, including elected and appointed officials, municipal and county staff, watershed groups, local water agencies, and NGOs, along with the public (e.g., residents, businesses, homeowners associations, etc.) are crucial to the development of the SWRP. The diverse motivation and viewpoints of each audience has shaped the development of this plan. Information regarding the goals, projects, programs, and needs identified in the SWRP was shared and the public (including stakeholders) was provided opportunities to provide feedback on the development of this plan, while the TAC provided technical guidance. The various educational outreach/education efforts for stakeholders and the public are detailed within the following subsections. Some of these approaches may also be used during community engagement executed during project design and implementation.

8.1 Education

The SBC SARW SWRP development provided an opportunity to educate local stakeholders and the public. In addition to the stakeholder and public outreach events described in **Section 4** and the sections below, education was promoted through printed materials, a SWRP webpage, and social media, each of which are further described in the subsections below. Printed materials and the SWRP webpage will be available during project design and implementation. The responsible party will incorporate these resources into future public outreach efforts.

8.1.1 Printed Materials

Printed materials were developed in an effort to educate stakeholders and the public. Printed materials included graphic posters displayed at outreach events, flyers, and informational handouts. The goals of the printed materials were to simply convey through illustrations and simplified text:

1. What is a SWRP?
2. Why is a SWRP necessary?
3. What types of solutions are included in the SBC SARW SWRP?

Multiple benefits provided through the SBC SARW SWRP implementation (water quality, water supply, flood management, environmental, and community benefits) were highlighted in printed material. The printed materials were also used to advertise stakeholder and public outreach events and solicit public review and comment of the SWRP. Printed materials were available to the public at the SBCFCD office, online, and outreach events. Some of the outreach material was printed in both English and Spanish. Copies of the printed materials available for distribution are included in **Attachment K**. Responsible parties will reference these printed materials during project design and implementation outreach efforts.

8.1.2 SWRP Webpage

The SBCFCD developed a webpage on their website providing accessible information to stakeholders and the public on the SBC SARW SWRP development. The webpage features an overview of the SWRP and included announcements regarding the outreach events and public comment period (schedule, start, end,

etc.). The webpage includes links to download educational materials, as detailed in **Section 8.1.1**. During the public review period, the Draft SBC SARW SWRP was posted on this webpage with directions on how to provide comments and feedback. The webpage provides contact information, which allows interested parties to contact key personnel with any comments/questions. The webpage allows stakeholders and the public to easily find information specific to the SBC SARW SWRP development and support the outreach and education efforts described in this section. The webpage will continue to host these resources and be utilized by responsible parties to support individual project design and implementation outreach efforts.

8.1.3 Social Media

Social media was used to advertise for the public outreach event. In particular, Facebook was utilized to support education and outreach efforts. The SWRP webpage link was included in posts, encouraging the public to access and review additional information. The SBCFCD collaborated with the Areawide Program and utilized their Facebook page. The Areawide Program Facebook page has over 13,000 followers.

8.2 Stakeholder Outreach

The SBCFCD sought opportunities to partner with local stakeholders in the implementation of projects/programs that provide multiple benefits (combination of water quality, water supply, flood management, community, and environmental benefits). Potential participants were invited to the stakeholder event. Opportunities included elected and appointed officials, municipal and county staff, watershed groups, local water agencies, and NGOs, along with other stakeholders, as summarized in **Table 8-1**.

Table 8-1 Participants Invited to the Stakeholder Outreach Events

Stakeholder Category	Potential Stakeholders
Elected/appointed officials	Local officials
Local municipalities	Big Bear Lake, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland, and Yucaipa
Neighboring counties	Orange County (Department of Public Works and Flood Control District) Riverside County Flood Control and Water Conservation District
Non-governmental organizations	Council for Watershed Health Inland Empire Waterkeeper
Regulators	SARWQCB SWRCB USACE
SBC departments	Flood Control District Public Health (Mosquito and Vector Control) Public Works Regional Parks Special Districts
Water agencies and member agencies	BBMWD - BBMWC
	CBWCD and Chino Basin Watermaster

Stakeholder Category	Potential Stakeholders
Water agencies and member agencies (continued)	IEUA – Cities of Chino, Chino Hills, Ontario, and Upland, Crawford Canyon Municipal Water Company, Cucamonga Valley Water District, Fontana Water Company, Monte Vista Water District, and San Antonio Water Company
	SBVMWD – Cities of Colton, Loma Linda, Redlands, and Rialto, EVWD, Marygold Mutual Water Company, Muscoy Mutual Water Company, RHWC, SBMWD, SBVWCD, South Mesa Water Company, Terrace Water Company, WVWD, Western Heights Water Company, and YVWD
	Six Basins Watermaster
	WMWD
	Warren Valley Basin Watermaster
	Other – City of Big Bear Lake Water Department, Big Bear City Community Service District, Fallsvale Service Company, Lake Arrowhead Community Services District, Lytle Creek Springs Water Company, and Running Springs Water District
Watershed groups	MSAR TMDL Task Force SAWPA
Other agencies	Bureau of Reclamation California Department of Transportation California Department of Water Resources California State Parks School Districts United States Forest Service (Trails Unlimited)

SBCFCD contacted potential participant agencies/organizations to identify the personnel that would best serve as the stakeholder representatives. Contact information of the potential participants was obtained at other outreach events by the members of the TAC. Invitations were distributed by email. Invitations were distributed a few weeks in advance, such that a preliminary head count was determined prior to the event. A running list of agencies/organizations and personnel invited were tracked along with any input received.

The stakeholder outreach events were held in mid-August 2017. Due to the large area the SBC SARW covers, the two stakeholder outreach events were in similar formats and were hosted at two different locations, one on the east side of the SBC SARW and the other on the west to encourage stakeholders throughout the watershed to participate.

The main goals of the stakeholder events were:

- Collect information regarding challenges faced in relationship to water quality, water supply, flood management, environmental, and the community;
- Gather details pertaining to current projects and programs conceptualized, planned, and implemented;
- Solicit project/program ideas to be included in the SWRP; and
- Obtain data pertinent to quantifying project/program benefits, including, but not limited to, monitoring data, flood studies, project/program concepts, system operations, etc.

Questions, comments, and concerns were addressed at the end of the meeting. The format of the stakeholder event was facilitated as a conversation, while a presentation was used to support discussions. The event included a sign-in sheet, which was used to gather information on the participants, and send out updates on the SWRP to allow stakeholders to review the SWRP during the public review period. Hard copies of the agenda were distributed along with informational handouts. The information identified in the agenda was presented utilizing a PowerPoint presentation, while discussions were encouraged after the presentation. Comment cards were provided to attendees to leave feedback.

8.3 Public Outreach

A public outreach event was held on July 24, 2018, to advertise the release of the public draft SWRP, provide an overview of the plan, and encourage public review and comment. The public outreach event was a model for the type of public outreach that shall be conducted during the implementation phase of the plan. The public was informed of the meeting through printed advertisements, email blasts, and social media. More than two dozen stakeholders and members of the public attended the event hosted at the SBCFCD office.

The subsections below describe mechanisms, processes, and milestones that were used to facilitate public participation and communication during development and implementation of the plan, including strategies to engage particular communities in project design and implementation. Additional details pertaining to the outreach efforts are included in the SPOEEP, which is included in **Attachment E**. **Figure 8-1** below is a picture from the outreach event on July 24, 2018.

Figure 8-1 Public Outreach Event

8.3.1 Strategies to Engage Disadvantaged Communities

A DAC is defined as a census geography (place, tract, or block group) where the annual median household income is less than 80 percent of the statewide annual median household income. Approximately 800,000 people lived in a DAC within the SBC SARW as of 2013, which was nearly half the entire population of the SBC SARW. Cities predominated by DACs tend to have limited resources and technical expertise, resulting in limited community support for multi-benefit project initiatives.

Engagement with DACs is an important aspect of project identification and implementation and is essential to develop support and understanding for the multi-benefit projects identified in the SWRP.

Figure 8-2 illustrates DAC blocks/tracts in the SBC SARW and the SWRP-identified projects. There are 37 projects that will be physically located within the boundaries of a census tract or block designated as a DAC. The remaining projects not located in a DAC will still provide benefits to DACs in terms of water supply to groundwater used to service DACs, water quality improvements for downstream DACs, or recreation benefits for nearby DACs.

The public outreach event held on July 24, 2018, during the development of the SBC SARW SWRP included strategies to engage DACs. The strategies included the production of notices and handouts in multiple languages (English and Spanish). The outreach materials for the July 24, 2018, SWRP public outreach event are included in **Attachment K**. These strategies can be replicated for the outreach effort for each project in the SWRP. Additionally, the sign-in sheets used at the public outreach event collected zip code information in an effort to track engagement from DAC areas. It was found that all of the attendees live within a zip code that contains a DAC area.

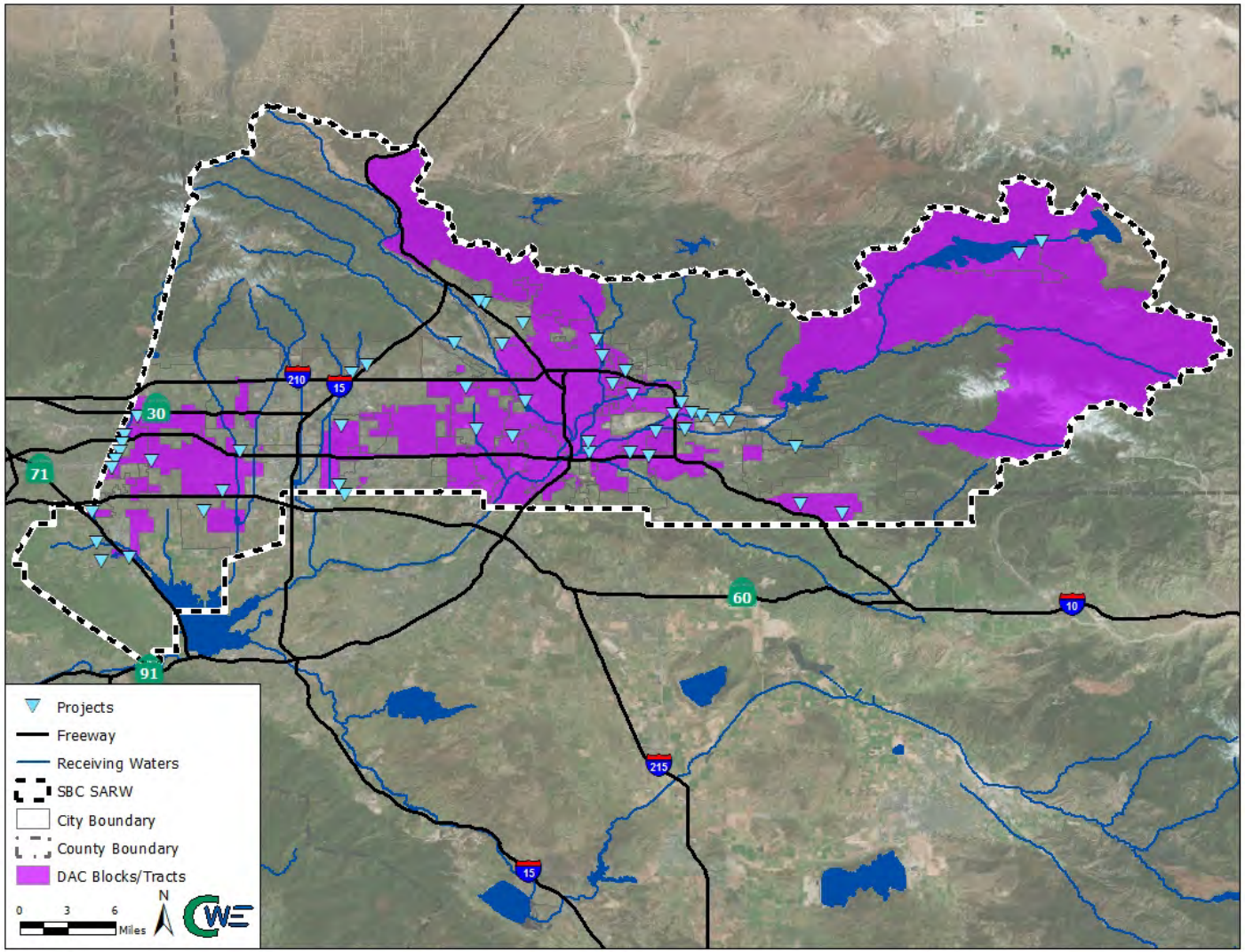


Figure 8-2 DAC Blocks/Tracts and SWRP Projects

8.3.2 Strategies to Address Environmental Injustice Needs and Issues

The USEPA defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." The goal of environmental justice will be achieved, according to the USEPA, only when everyone has the same degree of protection from environmental and health hazards, and when everyone enjoys equal access to the decision-making process.

Many of the strategies to encourage DAC participation are the same strategies to encourage equal access to the decision-making process, such as multilingual outreach efforts and dynamic approaches to community notification. Many projects in the SWRP help DACs achieve protection from environmental and health hazards. Because DACs are often located near industrial areas, DACs tend to experience stormwater or groundwater pollution more directly. Projects located within a DAC that improve water quality will help address environmental injustice caused by pollution, and there are many projects within the SWRP that achieve this goal. Additional details pertaining to the outreach approach in regards to engaging areas impacted by environmental injustice needs and issues are included in the SPOEEP (**Attachment E**).

8.3.3 Engagement during Project Design and Implementation

The public was engaged during the development of the SWRP and will also be engaged with during project design and implementation. **Section 8.1** describes how the educational components developed as part of this SWRP (printed materials, webpage, etc.) will be utilized to support outreach efforts conducted during design and implementation. Parties responsible for project implementation will also be responsible for conducting public outreach. Public outreach is typically performed by the responsible parties in the vicinity of the project being implemented. Agencies typically send informational flyers and host outreach events. Information regarding the SWRP and multiple benefits will be incorporated into these outreach efforts.

Responsible parties will evaluate opportunities to allow for public input on the project during the design process. This may include input on landscape materials, educational signage, etc. If public input is appropriate, then outreach will be conducted during the earlier phases of design, such as during preliminary design and also after 50% design is complete to share how input was incorporated. In instances where public input is not beneficial, educational outreach may be conducted as project design is being finalized and prior to construction in an effort to educate the public on the project, the multiple benefits it provides, and how it fits into the SWRP.

9. References

California Stormwater Quality Association (CASQA). 2003. Stormwater Best Management Practice Handbook: New Development and Redevelopment.

Chino Basin Watermaster (CBWM). September 2013. 2013 Amendment to the 2010 Recharge Master Plan Update. http://www.cbwm.org/docs/engdocs/2013%20Amendment%20to%20the%202010%20RMPU/2013%20Amendment%20to%20the%202010%20RMPU%20%E2%80%93%20Sections%201%20through%208.pdf

Chino Basin Watermaster (CBWM). June 2017. 2016 State of the Basin Report. Prepared by WEI for Chino Basin Watermaster.

Chino Basin Watermaster (CBWM). April 2018. Optimum Basin Maximum Benefit Annual Report 2017. Prepared by WEI for the Chino Basin Watermaster and Inland Empire Utilities Agency.

CWE. June 2017 (2017a). San Bernardino County Santa Ana River Watershed Stormwater Resource Plan: Annotated List of Data and Reports Technical Memorandum. Prepared for the SBCFCD.

CWE. June 2017 (2017b). San Bernardino County Santa Ana River Watershed Stormwater Resource Plan: Planning Area Description Technical Memorandum. Prepared for the SBCFCD.

Department of Natural Resources, State of Minnesota (DNR). 2018. Surface-Water Watersheds vs. Ground-Water Watersheds. https://www.dnr.state.mn.us/watersheds/surface_ground.html.

Department of Water Resources, State of California (DWR). 2018. Integrated Regional Water Management. https://www.water.ca.gov/Programs/Integrated-Regional-Water-Management.

Executive Office of the President – Council of Economic Advisers. 2009. Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009. https://obamawhitehouse.archives.gov/sites/default/files/microsites/Estimate-of-Job-Creation.pdf.

Federal Register. 2000. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California. https://www.federalregister.gov/documents/2000/05/18/00-11106/water-quality-standards-establishment-of-numeric-criteria-for-priority-toxic-pollutants-for-the.

Geosyntec Consultants. December 2008. A User's Guide for the Structural BMP Prioritization and Analysis Tool (SBPAT v1.0) Technical Appendices. Prepared for Heal the Bay, City of Los Angeles, and County of Los Angeles Department of Public Works.

Los Angeles Regional Water Quality Control Board (LARWQCB). April 2015. Attachment B to Resolution No. R15-004. Amendment to the Water Quality Control Plan for the Los Angeles Region to Revise the Los Angeles River and Tributaries Metals TMDL. http://63.199.216.6/bpa/docs/R15-004_BPA_CH_7.pdf.

Inland Empire Utilities Agency (IEUA). May 2016 (2016a). 2016 Chino Basin Storm Water Resources Plan Functional Equivalency Document. https://18x37n2ovtbb3434n48jhbs1-wpengine.netdna-ssl.com/wp-content/uploads/2016/05/Chino-Basin-SWRP-20160513.pdf.

Inland Empire Utility Agency (IEUA). 2016 (2016b). IEUA FY 2015-2016 Annual Water Use Report: Retail Agency Water Use and Five Year History. https://18x37n2ovtbb3434n48jhbs1-wpengine.netdna-ssl.com/wp-content/uploads/2017/01/16269-Annual-Water-Use-Report-15-16-20161116.pdf. Referenced April 2017.

Inland Empire Utilities Agency (IEUA). 2016 (2016c). Integrated Water Resources Plan: Water Supply & Climate Change Impacts 2015—2040. https://www.ieua.org/download/integrated-water-resources-plan-2015/.

Inland Empire Utilities Agency (IEUA) and Water Facilities Authority (WFA). June 2016. 2015 Urban Water Management Plan. https://18x37n2ovtbb3434n48jhbs1-wpengine.netdna-ssl.com/wp-content/uploads/2016/07/FINAL-IEUA-WFA-2015-UWMP-2016-07-07.pdf. Referenced April 2017. Prepared by Water System Consulting (WCS).

Mitchell, Patrick. 2006. From Crest to Coast—110 Miles Along Southern California's Largest River System (page 17). Berkeley: Wilderness Press.

Pavley, Fran. 2009. SB-790 09/04/09 – Senate Floor Analyses. C alifornia Legislative Information. http://leginfo.legislature.ca.gov/faces/billAnalysisClient.xhtml?bill_id=200920100SB790.

San Bernardino Association of Governments (SANBAG). January 2012. Land Use Data, Existing Land Use – 2011 (Parcel Level). http://maps.sanbag.ca.gov/website/Landuse_data.htm.

San Bernardino County (SBC). 2007 (2007a). 2007 General Plan (page 169). http://www.sbcounty.gov/Uploads/lus/CommunityPlans/BearValleyCP.pdf. Prepared by URS Corporation.

San Bernardino County (SBC). 2007 (2007b). Final Program Environmental Impact Report San Bernardino County 2007 General Plan Program (page 127). http://www.sbcounty.gov/Uploads/lus/GeneralPlan/FinalEIR2007.pdf. Prepared by URS Corporation.

San Bernardino County (SBC). 2007 (2007c). General Plan, Bear Valley Community Plan (page 51). http://www.sbcounty.gov/Uploads/lus/CommunityPlans/BearValleyCP.pdf. Prepared by URS Corporation.

San Bernardino County (SBC). 2017 (2017d). Regional Parks. http://cms.sbcounty.gov/parks/Home.aspx.

San Bernardino County Areawide Stormwater Program. August 2011. Integrated Watershed Monitoring Program. Submitted to the Santa Ana Regional Water Quality Control Board. Prepared by Larry Walker and Associates. http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/stormwater/docs/sbpermit/iwmp/Revised_IWMP.pdf.

San Bernardino County Areawide Stormwater Program. May 2013 (2013a). Hydromodification Management and Monitoring Plan for the Santa Ana River Watershed Region within the County of San Bernardino. http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/stormwater/docs/sbpermit/wap/Phase2/WAPAppendixH-HMP.pdf.

San Bernardino County Areawide Stormwater Program. May 2013 (2013b). Technical Guidance Document for Water Quality Management Plans. http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/docs/sbpermit/wqmp/Final/Final_TGD_WQMP_Appendices.pdf.

San Bernardino County Areawide Stormwater Program. May 2013 (2013c). San Bernardino County Watershed Action Plan. http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/docs/sbpermit/wap/Phase2/WAP-FINAL.pdf.

San Bernardino County Areawide Stormwater Program. August 2014. Report of Waste Discharge. Application for Renewal of the Municipal NPDES Stormwater Permit NPDES Permit No. CAS618036. http://sbcountystormwater.org/wp-content/uploads/2013/10/San-Bernardino-County-2014-ROWD-Final-8.1.14.pdf.

San Bernardino County Areawide Stormwater Program. 2014. San Bernardino County Areawide Stormwater Program – Phase I Fiscal Year June 2013- June 2014 Annual Report. Prepared by CWE.

San Bernardino County Areawide Stormwater Program. January 2015 (2015a). Municipal Stormwater Management Plan. Submitted to the Santa Ana Regional Water Quality Control Board.

San Bernardino County Areawide Stormwater Program. 2015 (2015b). Big Bear Lake Nutrient TMDL Annual Water Quality Report 2015.

San Bernardino County Areawide Stormwater Program. 2015 (2015c). San Bernardino County Areawide Stormwater Program – Phase I Fiscal Year June 2014- June 2015 Annual Report. Prepared by CWE.

San Bernardino County Areawide Stormwater Program. 2016. San Bernardino County Areawide Stormwater Program – Phase I Fiscal Year June 2015- June 2016 Annual Report. Prepared by CWE

San Bernardino County Department of Public Works (SBCDPW). Comprehensive Storm Drain Plans. http://cms.sbcounty.gov/dpw/FloodControl/Planning/MPD.aspx.

San Bernardino County Department of Public Works (SBCDPW). Master Plan of Drainage. http://cms.sbcounty.gov/dpw/FloodControl/Planning/MPD.aspx.

San Bernardino County Flood Control District (SBCFCD). June 2011. Comprehensive Bacteria Reduction Plan. Submitted to the California Regional Water Quality Control Board, Santa Ana Region. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/msar/cbrp/scb/Final_SBCo_CBRP_wAttachments.pdf.

San Bernardino County Flood Control District (SBCFCD). July 2012. Big Bear Lake Nutrient TMDL Compliance Program Watershed-Wide Monitoring Plan. Prepared by Brown and Caldwell.

San Bernardino Valley Municipal Water District (SBVMWD). January 2015. Upper Santa Ana River Watershed Integrated Regional Water Management Plan. http://www.sbvwcd.org/docman-projects/upper-santa-ana-integrated-regional-water-management-plan/3802-usarw-irwmp-2015-ch1-9-final/file.html. Referenced April 2017. Prepared by Water System Consulting (WCS).

San Bernardino Valley Municipal Water District (SBVMWD). June 2016. 2015 San Bernardino Valley Regional Urban Water Management Plan. http://www.sbvmwd.com/home/showdocument?id=4196.

Santa Ana Regional Water Quality Control Board (SARWQCB). January 2005, most recently updated February 2016 (2005a). Water Quality Control Plan for the Santa Ana River Basin (8). http://www.swrcb.ca.gov/santaana/water_issues/programs/basin_plan/index.shtml.

Santa Ana Regional Water Quality Control Board (SARWQCB). 2005 (2005b). Attachment to Resolution No. R8-2005-0097. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/bigbear/sediment/attachment_a_0705.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). 2005 (2005c). Resolution No. R8-2005-0001; Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate Bacterial Indicator Total Maximum Daily Loads (TMDLs) for Middle Santa Ana River Watershed Waterbodies. http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2005/05_001.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). 2005 (2005d). Staff Report on the Sediment Total Maximum Daily Loads for Big Bear Lake and Rathbun Creek. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/bigbear/sediment/tmdl_sediment_part_1_0705.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). 2006. Resolution No. R8-2006-0023; Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate a Nutrient Total Maximum Daily Load (TMDL) for Dry Hydrological Conditions for Big Bear Lake. http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2006/06_023.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). May 2007. Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate Bacterial Indicator Total Maximum Daily Loads (TMDLs) for Middle Santa Ana River Watershed Waterbodies. http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2005/05_001.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). October 2008. Big Bear Lake Technical Support Document for Mercury TMDL. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/bigbear/mercury/tetra_tech_bbl_support_document_10_31_08.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). January 2010. National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for the San Bernardino County Flood Control District, the County of San Bernardino, and the Incorporated Cities of San Bernardino County Within the Santa Ana Region, Area Wide Urban Stormwater Runoff Management Program. Order No. R8-2010-0036, NPDES No. CAS618036. http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2010/10_036_SBC_MS4_Permit_01_29_10.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). January 2012 (2012a). Recreation Standards Amendments Staff Report: Executive Summary. http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/docs/rec_standards/BPA_REC_Standards_Exec_Summary.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). June 2012 (2012b). Resolution No. R8-2012-0001. Resolution Approving Amendments to the Basin Plan Pertaining to Bacteria Quality Objectives and Implementation Strategies, Recreation Beneficial Uses, the Addition and Deletion of Certain Waters Listed in the Basin Plan and Designation of Appropriate Beneficial Uses, and Other Minor Modifications. http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/docs/rec_standards/supplemental/R8-2012-0001-rev4-24-12.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). October 2013. Use Attainability Analysis – Cucamonga Creek Reach 1. http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/docs/rec_standards/UAA/Cucamonga_UAA_10-7-13_Final.pdf.

Santa Ana Regional Water Quality Control Board (SARWQCB). April 2017. Resolution No. R8-2017-0013 Approval of Recommendations for the Federal Clean Water Act (CWA) Section 303(d) List. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/303d.shtml.

Santa Ana Watershed Project Authority (SAWPA). 2009. Big Bear Lake Nutrient TMDL Compliance Program Watershed-Wide Monitoring Plan. http://www.sawpa.org/wp-content/uploads/2012/05/Big-Bear-Lake_Monitoring-Plan-FINAL.pdf.

Santa Ana Watershed Project Authority (SAWPA). 2010 (2010a). Big Bear Lake TMDL Action Plan. http://www.sawpa.org/wp-content/uploads/2012/05/S01255.FINAL_Big-Bear-LakeTMDL-Action-Plan-8-26-2010.pdf.

Santa Ana Watershed Project Authority (SAWPA). 2010 (2010b). One Water, One Watershed Plan. http://www.sawpa.org/owow-1-0-2/.

Santa Ana Watershed Project Authority (SAWPA). February 2014. One Water, One Watershed Plan 2.0. http://www.sawpa.org/owow-2-0-plan-2/. Referenced April 2017.

Santa Ana Watershed Project Authority (SAWPA). February 2016. Santa Ana River Watershed Bacteria Monitoring Program. Prepared by CDM Smith. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/msar/Monitoring_QAPP/Final_Monitoring_Plan_February_2016.pdf.

State Water Resources Control Board (SWRCB). GeoTracker. https://geotracker.waterboards.ca.gov/.

State Water Resources Control Board (SWRCB). Safe Drinking Water Information System (SDWIS) Version 3.21, California Public Water Supply Systems Search Parameters. https://sdwis.waterboards.ca.gov/PDWW/.

State Water Resources Control Board (SWRCB). 2004. Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List. http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/ffed_303d_listingpolicy093004.pdf.

State Water Resources Control Board (SWRCB). July 2005. Big Bear Lake and Rathbun Creek Draft Sedimentation/Siltation TMDLs Technical Report. http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/tmdl/docs/bigbear/sediment/tmdl_sediment_part_2_0705.pdf.

State Water Resources Control Board (SWRCB). October 2008. Big Bear Lake Technical Support Document for Mercury TMDL. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/bigbear/mercury/tetra_tech_bbl_support_document_10_31_08.pdf.

State Water Resources Control Board (SWRCB). 2012. Resolution 2015-0021. Approving the Clean Water Act Section 303(d) List Portion of the Proposed 2012 California Integrated Report. http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml.

State Water Resources Control Board (SWRCB). 2015 (2015a). Amendment to the Water Quality Control Plan for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surfaces, Enclosed Bays, and Estuaries of California. http://www.waterboards.ca.gov/water_issues/programs/trash_control/docs/01_final_sed.pdf.

State Water Resources Control Board (SWRCB). 2015 (2015b). Storm Water Resource Plan Guidelines. http://www.waterboards.ca.gov/water_issues/programs/grants_loans/swgp/docs/prop1/swrp_finalguidelines_dec2015.pdf.

State Water Resources Control Board (SWRCB). June 2017 (2017a). 2014 and 2016 California Integrated Report Clean Water Act Sections 303(d) and 305(b) Staff Report. June 9, 2017.

State Water Resources Control Board (SWRCB). March 2017 (2017b). San Bernardino County Flood Control District and California State Water Resources Control Board Planning Grant: Stormwater Planning: San Bernardino County Santa Ana River Watershed Group (SBC SARWG) Stormwater Resource Plan. Agreement No. D1612627.

United States Department of Agriculture (USDA). 2017 (2017a). Cucamonga Wilderness. https://www.fs.usda.gov/detail/angeles/specialplaces/?cid=stelprdb5210347.

United States Department of Agriculture (USDA). 2017 (2017b). San Gorgonio Wilderness. https://www.fs.usda.gov/detail/sbnf/specialplaces/?cid=stelprd3821641.

United States Department of Labor – Bureau of Labor Statistics (BLS). 2016. Employee Tenure in 2016. Economic News Release USDL-16-1867. https://www.bls.gov/news.release/pdf/tenure.pdf.

United States Environmental Protection Agency (USEPA). August 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. https://www3.epa.gov/npdes/pubs/usw_b.pdfhttps://www.epa.gov/sites/production/files/2015-11/documents/urban-stormwater-bmps_preliminary-study_1999.pdf.

United States Environmental Protection Agency (USEPA). 2016. CADDIS Volume 2: Sources, Stressors & Responses, pH. https://www3.epa.gov/caddis/ssr_ph_int.html. February 22, 2016.

United States Environmental Protection Agency (USEPA). 2017. Impaired Waters and TMDLS. https://www.epa.gov/tmdl/program-overview-impaired-waters-and-tmdls.

United States Environmental Protection Agency (USEPA). 2018. "Environmental Justice". https://www.epa.gov/environmentaljustice

Warrick, Jonathan A., and David M. Rubin. June 2007. Suspended-Sediment Rating Curve Response to Urbanization and Wildfire, Santa Ana River, California. Journal of Geophysical Research, Vol. 112, Issue F2. http://onlinelibrary.wiley.com/doi/10.1029/2006JF000662/abstract.

Western Municipal Water District (WMWD). May 2008. Western Municipal Water District Integrated Regional Water Management Plan 2008 Update. Prepared by Kennedy/Jenks Consultants. http://www.wmwd.com/DocumentCenter/Home/View/350.

Attachment A

Annotated List of Data and Reports Technical Memorandum

TECHNICAL MEMORANDUM

To: Arlene Chun, PE
Harold Zamora, PE

From: Katie Thomas, PE
Ilana Ton

Date: June 9, 2017

Subject: **San Bernardino County Sana Ana River Watershed Stormwater Resource Plan: Annotated List of Data and Reports**

---

1. Introduction

California voters passed the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) during the general election of November 4, 2014. As a precursor to the passage of Proposition 1, the California Legislature adopted Senate Bill (SB) 985 entitled the Stormwater Resource Planning Act (SB 985), requiring the development of a Stormwater Resource Plan (SWRP) to be eligible to receive grants from a bond act approved after January 1, 2014, for stormwater and dry-weather runoff capture projects. A SWRP is a stormwater management document developed on a watershed basis that identifies a prioritized list of projects to address stormwater and dry-weather runoff, while also providing multiple benefits, such as water supply, flood management, and environmental and community enhancements. The State Water Resources Control Board (SWRCB) developed Stormwater Resource Plan Guidelines (2015) to help facilitate the proper preparation of SWRPs. Proposition 1 includes numerous categories of projects to be funded, one being the Stormwater Grant Program. Planning and implementation grants were included in the Stormwater Grant Program. Planning grants are to be used for developing SWRPs and/or conducting studies prior to project implementation while the implementation grants are used to fund projects identified in a SWRP or equivalent document.

The San Bernardino County Flood Control District (SBCFCD) was awarded planning grant funds through the Stormwater Grant Program for the development of the San Bernardino County Santa Ana River Watershed (SBC SARW) SWRP (Grant Agreement No. D1612627). The SBC SARW SWRP encompasses the upper limits of the Santa Ana River (SAR) Watershed that lies within the San Bernardino County jurisdictional boundary.

A variety of Technical Memorandums (TMs) will be prepared throughout the development of the SBC SARW SWRP consistent with the final Grant Agreement. The information included in the TMs will be incorporated into the SWRP. Additional information pertaining to the SBC SARW SWRP planning area is

included in the Planning Area Description TM. This TM describes references that will be reviewed, and utilized as appropriate, to support the development of the SBC SARW SWRP. References have been categorized as existing permits; planning documents; studies and reports; GeoTracker; Geographic Information Systems (GIS) data; Total Maximum Daily Loads (TMDLs); and additional data. The list of references summarized in this TM will continue to grow as the SWRP is being developed. In addition to the references identified, the SWRP Guidelines will be referenced throughout the development of the SWRP, as these guidelines serve as the basis for the SWRP being prepared. The SWRP Guidelines were developed consistent with Water Code section 1560 et seq. It is likely the Water Code will also be referenced as a guiding document to support the SWRP development.

2. National Pollutant Discharge Elimination System Permits

Section V.D of the SWRP Guidelines (2015) states that all SWRPs must be implemented in accordance with applicable National Pollutant Discharge Elimination System (NPDES) permits and waste discharge requirements. This section summarizes the Municipal Separate Storm Sewer System (MS4) Permit covering the SBC SARW area and the Report of Waste Discharge (ROWD) submitted for renewal of the MS4 Permit. In addition to these, other NPDES permit programs will be under consideration, such as the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), which are not as applicable to the development of the SWRP.

2.1 NPDES Municipal Separate Storm Sewer System Permit Order No R8-2010-0036

The NPDES Permit and Waste Discharge Requirements for the SBCFCD, the County of San Bernardino, and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Order No. R8-2010-0036 (MS4 Permit) was adopted on January 29, 2010, and expired on January 29, 2015. The MS4 Permit was administratively extended until a new permit is issues. The MS4 Permit regulates the discharge of pollutants from anthropogenic sources from MS4s. Among many things, the MS4 Permit outlines the responsibilities of the Permittees, defines discharge prohibitions and receiving water limitations, and identifies programs that must be implemented in an effort to minimize pollutant discharges. The MS4 Permit details the granted legal authority and expectations of the Permittees which include inspections, enforcement , prohibition of waste discharge, and other actions necessary to uphold the MS4 Permit requirements. Although the expiration date has passed, the MS4 Permit must be abided by until a new MS4 Permit is adopted by the Santa Ana Regional Water Quality Control Board (RWQCB). The MS4 Permit applies to the SBC SARW area and the SWRP will be developed to be consistent with the requirements contained within it.

2.1.1 Report of Waste Discharge: Application for Renewal of the Municipal NPDES Stormwater Permit (NPDES Permit No. CAS618036)

The ROWD was prepared as part of the MS4 Permit renewal application process, which will result in the development and adoption of a fifth-term MS4 Permit by the RWQCB in the near future. The ROWD identifies the accomplishments of the Areawide Stormwater Program (Program), which implements the

shared requirements set forth by the MS4 Permit, and develops priorities for the watershed area. The document presents evidence that the iterative Program Best Management Practice (BMP) approach works well in this area. The data and findings included within the ROWD will be referenced throughout the SWRP development and may be used to support approaches taken to address the SWRP Guidelines (2015).

3. Planning Documents

Various plans and programs have been developed and will be reviewed and utilized as appropriate in the development of the SWRP. Relevant documents include planning documents prepared by San Bernardino County, local agencies, groups of agencies, and regulatory entities. The following sections summarize integrated water resource plans, water quality and monitoring plans, stormwater planning documents developed for San Bernardino County, urban water management plans, and other planning documents.

3.1 Integrated Water Management Plans

3.1.1 SAWPA: One Water, One Watershed Plan 2.0

The One Water, One Watershed (OWOW) Plan is the Santa Ana River Watershed Integrated Regional Water Management (IRWM) Plan (IRWMP) prepared by the Santa Ana Watershed Project Authority (SAWPA). This plan reflects a collaborative planning process that addresses various aspects of water resources in the region (watershed). This collaborative plan crosses multiple jurisdictional boundaries and includes a public input process. The plan includes an approach for identifying and prioritizing multi-benefit projects and program, presents innovative solutions, and addresses other water resource related issues. The current version of this plan is 2.0, while an update is currently in progress. The SBC SARW SWRP will be submitted to SAWPA for incorporation into the OWOW Plan. This document will be referenced for information pertaining to the watershed and projects identified in the plan that are located within the SBC SARW may be identified and prioritized in the SWRP.

3.1.2 IEUA Integrated Water Resources Plan

The Integrated Water Resources Plan: Water Supply & Climate Change Impacts 2015 - 2040 (IRP) was prepared by the Inland Empire Utilities Agency (IEUA) in 2015. This document identifies a plan for ensuring reliable, cost-effective, and environmentally responsible water supplies for the next 25 years. The IRP goals are to integrate and update water resources planning documents in a comprehensive manner and develop an implementation strategy to improve near-term and long-term water resources management for the region. The IRP also evaluates new growth, development, and water demand patterns within the service area and assesses the water needs and supply source vulnerabilities under climate change. This document will provide information pertaining to water supply and demand within the IEUA service area, which will be included in the SWRP, as required by the Water Code. Potential projects identified within the document will also be reviewed to identify if there are opportunities to include them in the SWRP.

3.1.3 Upper Santa Ana River Watershed Integrated Regional Water Management Plan (SBVMWD)

San Bernardino Valley Municipal Water District (SBVMWD) prepared an IRWMP in 2015 to integrate planning among the agencies in the IRWM Region which begins upstream of Prado Dam and extends into the San Bernardino Mountains covering an area over 850 square miles. The IRWMP recognizes the priority of improving water supply reliability by implementing local supply projects given that imported water is increasingly viewed as a less reliable supply. The plan includes a water budget, goals and objectives, water management strategies, projects identified to help meet the region's objectives, and an implementation plan for doing so. The goals and objectives identified in this IRWMP will be reviewed and the goals and objectives of the SWRP will be made consistent with these goals, as appropriate. Potential projects identified within the document will also be reviewed to identify if there are opportunities to include them in the SWRP.

3.1.4 Updated Integrated Regional Water Management Plan (WMWD)

Western Municipal Water District (WMWD) prepared an Updated Integrated Regional Water Management Plan in 2015 covering their service area, which is located in Riverside County, adjacent to the SBC SARW area. The update addresses long range water quantity, quality, and environmental planning needs within the service area. This document identifies and evaluates water management strategies; addresses local and regional water quality, environmental, and disadvantaged community issues; discusses other regional planning efforts; and compiles an estimate of water demands by member agencies. Although WMWD's service area does not cover any portion of the SBC SARW area, a portion of the water served by WMWD is pumped from a groundwater aquifer that extends into San Bernardino County; therefore, actions taken over the groundwater aquifer may impact WMWD. This plan will be reviewed to determine if information presented within it is applicable to the SBC SARW SWRP. Projects identified in the IRWMP will be evaluated for inclusion in the SWRP.

3.2 Water Quality and Monitoring Plans

3.2.1 Basin Plan

The Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) is the basis for the RWQCB's regulatory program for controlling water quality. The Basin Plan includes a collection of water quality goals, descriptions of water quality conditions, and discussions of solutions. The Basin Plan establishes water quality standards for ground and surface waters of the region. The Basin Plan contains information on policies, beneficial uses of the waters of the Santa Ana Region, monitoring programs, and other miscellaneous topics in regards to water quality management. The SWRP will identify water bodies within the SBC SARW area, along with their beneficial uses. Water quality data will be analyzed to determine the pollutant priorities within each water body. The Basin Plan will serve as an important reference for classifying water bodies and determining priorities.

3.2.2 Big Bear Lake Watershed-Wide Nutrient Monitoring Plan

The Big Bear Lake Watershed-Wide Nutrient Monitoring Plan was submitted by the Big Bear Lake TMDL Task Force (TMDL Task Force) with the intent to: review and update the Big Bear Lake Nutrient TMDL; determine the sources of nutrients; develop TMDLs for wet and moderate years hydrologic conditions; and determine compliance with the Big Bear Lake Dry Nutrient TMDL, including Waste Load Allocations (WLAs) and Load Allocations (LAs). Similar to the Santa Ana River Watershed Bacteria Monitoring Plan described below in **Section 3.2.6**, monitoring results associated with the implementation of this monitoring program will be utilized in the SWRP to identify water quality priorities and assess the need for projects at key locations within the SBC SARW. Additionally, this monitoring program will be assessed to determine if continued implementation will support the goals and adaptive management of the SWRP.

3.2.3 Comprehensive Bacteria Reduction Plan

The Comprehensive Bacteria Reduction Plan (CBRP) was prepared in response to the MS4 Permit. The CBRP is a long-term plan designed to achieve compliance with dry-weather condition WLAs for bacterial indicators established by the Middle Santa Ana River (MSAR) Bacterial Indicator TMDL as well as a monitoring program to track progress towards compliance. The CBRP will be referenced for information regarding the MSAR Bacterial Indicator TMDL, such as requirements, and implementation actions (projects and programs).

3.2.4 Hydromodification Management and Monitoring Plan

A Hydromodification Management and Monitoring Plan for the Santa Ana River Watershed Region, within the County of San Bernardino, was developed to fulfill the requirements of Section XI.B.3.b.ii of the MS4 Permit. The Plan evaluates hydromodification impacts for drainage channels deemed most susceptible to degradation, identifies sites to be monitored (including assessment methodology and required follow-up actions based on results), and identifies monitoring sites that may be used to evaluate the effectiveness of stormwater BMPs. This document will be referenced during the project selection process. Areas susceptible to hydromodification will be identified and projects may be proposed to mitigate concerns. Additionally, this plan will be reviewed to verify projects proposed in the SWRP will not worsen impacts associated with hydromodification.

3.2.5 Integrated Watershed Monitoring Program

The Integrated Watershed Monitoring Program (IWMP) was prepared in response to the MS4 Permit. The objective of the IWMP is to provide data to support the development of an effective watershed and key environmental resources management program that focuses resources on the priority pollutants of concern. The IWMP includes the following monitoring programs: core; illegal discharge/illicit connection; hydromodification; source identification and special studies; and regional watershed. Monitoring results associated with the implementation of this monitoring program will be utilized in the SWRP to identify water quality priorities and assess the need for projects at key locations within the SBC SARW. Additionally, this monitoring program will be assessed to determine if continued implementation will support the goals and adaptive management of the SWRP.

3.2.6 Santa Ana River Watershed Bacteria Monitoring Plan

The Santa Ana River Watershed Bacteria Monitoring Plan establishes the requirements for bacteria sampling to support the following objectives: fulfill the monitoring and surveillance requirements of the 2012 adopted Basin Plan Amendment to Revise Recreation Standards for Inland Freshwaters in the Santa Ana Region; conduct sampling to support implementation of the MSAR Bacterial Indicator TMDL; and support any additional bacterial indicator monitoring that may be conducted in the watershed to support regional regulatory activities or requirements. Monitoring results associated with the implementation of this monitoring program will be utilized in the SWRP to identify water quality priorities and assess the need for projects at key locations within the SBC SARW. Additionally, this monitoring program will be assessed to determine if continued implementation will support the goals and adaptive management of the SWRP.

3.2.7 Water Quality Monitoring Data

The existing water quality monitoring data from the monitoring programs described above will be utilized to establish the current baseline water quality conditions within the SBC SARW. The monitoring data will be compiled and compared to water quality objectives (WQOs) to identify Water Body-Pollutant Combinations (WBPC). Projects and programs identified in the SWRP will aim to address the WBPCs identified.

3.3 San Bernardino County Stormwater Planning

3.3.1 San Bernardino County Watershed Action Plan

In response to the MS4 Permit, a Watershed Action Plan (WAP) was developed for San Bernardino County in two phases. A hydromodification assessment was provided within the WAP to examine the thresholds for determining whether a creek is subject to hydromodification impacts due to future development. References were made to the System-Wide Evaluation Retrofit Opportunities TM and an Evaluation of Retrofit Sites for Water Quality Improvements, which is an extension to the TM. The TM identifies opportunities to retrofit existing stormwater conveyance systems, parks, and other recreational areas with water quality protection measures and includes recommendations for specific retrofit studies that incorporate opportunities for addressing applicable TMDLs. The evaluation explores the availability and applicability of the identified projects to a specific water quality concern. The document also includes a cost-benefit analysis of each potential retrofit site in the context of the water quality improvement needs of the subwatershed and watershed. The methodology used to identify projects and quantify benefits will be reviewed and referenced as appropriate in the SWRP.

3.3.2 Technical Guidance Document for Water Quality Management Plans

The Technical Guidance Document (TGD) for Water Quality Management Plans (WQMPs) was prepared in response to the MS4 Permit and describes requirements for new development and significant redevelopment projects to incorporate Low Impact Development (LID) BMPs to the maximum extent practicable. This document provides guidance for incorporation of site design/LID, source control, and treatment control BMPs. This document also addresses Hydrologic Conditions of Concern (HCOC)

mitigation measures necessary for specific new and redevelopment sites. The methodology for sizing LID BMPs along with design specifications will be referenced within the SWRP when identifying similar types of stormwater BMP projects, such that the approach and specifications are consistent with this approved and implemented guidance document.

3.3.3 Municipal Stormwater Management Plan

This Municipal Stormwater Management Plan (MSWMP) is an interim umbrella document that presents the overall MS4 Permit implementation approach as managed by the San Bernardino County Areawide Stormwater Program. The MSWMP is developed to delineate the following Areawide Programs: program management; illegal discharges; industrial/commercial sources; new development and redevelopment; public agency activities; residential program activities; public information and participation; program evaluation; and monitoring. The MSWMP will be referenced to verify the SWRP is consistent with the currently implemented stormwater program.

3.4 Urban Water Management Plans

3.4.1 IEUA and WFA Urban Water Management Plan

The 2015 Urban Water Management Plan (UWMP) is an update to the IEUA and Water Facilities Authority's (WFA) 2010 UWMP. IEUA provides services for the southwestern section of San Bernardino County in the SARW which also encompasses the WFA's service area of 135 square miles within the upper SARW. This UWMP lays out the region's plan for ensuring reliable, cost-effective, and environmentally responsible water supplies for the next 25 years. This document includes information about water demand, water supply, and supply reliability assessment in the IEUA service region. The IEUA and WFA UWMP will be referenced during the development of the SWRP for information regarding water supply and demand and potential projects that may be included in the SWRP.

3.4.2 San Bernardino Valley Regional Urban Water Management Plan

The SBVMWD prepared the San Bernardino Valley Regional Urban Water Management Plan (UWMP) in 2015 and updated it in 2016. The SBVMWD service area includes nine additional water agencies, which are served by SBVMWD. The UWMP provides a summary of the anticipated supplies and demands for the years of 2015 through 2040. This document includes 16 sections and is over 1,100 pages. The sections include, but are not limited to, regional water sources, regional water use, contingency planning, future goals, and recommended projects. The SBVMWD UWMP will be referenced during the development of the SWRP for information regarding water supply and demand. Potential projects identified within the document will also be reviewed to identify if there are opportunities to include them in the SWRP.

3.5 Other Planning Documents

3.5.1 Chino Basin Stormwater Resources Plan Functional Equivalency Document

The objective of the Chino Basin Stormwater Resources Plan Functional Equivalency Document is to demonstrate that the accumulation of existing stormwater and dry-weather flow management programs and their implementation agreements in the Chino Basin are functionally equivalent to a SWRP. The IEUA, Chino Basin Watermaster, Chino Basin Water Conservation District (CBWCD), SBCFCD, and the region's cities and water districts have worked together since 2000 to implement regional programs within the Chino Groundwater Basin to increase groundwater recharge by using stormwater and dry-weather runoff. This collaboration has resulted in the development of recharge master plans; the construction, operation, maintenance, and monitoring of new recharge project facilities; periodic reviews of these recharge projects' performance; and periodic updates to recharge master plans. This document references a variety of other documents that together satisfy the SWRP Self-Certification Checklist, making projects referenced in these documents eligible for Proposition 1 implementation grant funding. This document, and the documents referenced within it, will be reviewed throughout the development of the SWRP development. Projects identified in this plan may also be included in the SBC SARW SWRP as appropriate.

3.5.2 Recharge Master Plan Update

The Chino Basin Watermaster and IEUA prepared a Recharge Master Plan Update (RMPU) in 2010 that was amended in 2013. The RMPU was prepared in response to a court order and includes a discussion on safe yield, review of water supply plans, description of existing stormwater recharge projects, assessment of stormwater recharge opportunities, evaluation of supplemental water recharge opportunities, and identifies future recharge plans. The 2013 amendment: addresses the changes since the 2010 RMPU and impacts of the revised groundwater production and replenishment projections; maintains an inventory of existing recharge facilities and their capabilities; utilizes monitoring, reporting, and accounting practices to estimate long-term average annual net stormwater recharge; and organizes recharge improvement projects and how to evaluate, rank, and apply the projects. The RMPU and amendment will be reviewed during the development of the SWRP to identify existing initiatives (projects and programs) that may be applicable to the SWRP. Potential projects identified within the documents will also be reviewed to identify if there are opportunities to include them in the SWRP.

3.5.3 Master Plans of Drainage

Master Plans of Drainage (MPD) were created to evaluate the existing drainage systems and recommend improvements and new facilities in an area based on localized drainage issues. MPDs are often developed based on projected future land uses in an undeveloped area and identify locations where storm drain facilities will be necessary. They address the current and future drainage needs of a city or area. SBCFCD has developed area specific MPDs covering developed portions of their jurisdiction (County unincorporated areas), some of which are available online and others available at their office. Additionally, some cities within the SBC SARW area have developed an MPD inclusive of their current and planned storm drain system. MPDs will be referenced as needed to verify storm drain locations and may

be used as a tool for identifying potential projects, as planned facilities (new and/or improved) may be incorporated into projects identified and prioritized in the SWRP.

3.5.4 Comprehensive Storm Drain Plans

Comprehensive Storm Drain Plans (CSDPs) are similar to MPDs, as they evaluate existing drainage systems, identify deficiencies, and recommend improvements based on localized drainage issues. The main difference between CSDPs and MPDs is that CSDPs do not plan for future facilities in undeveloped areas; rather, they may identify future facilities needed to mitigate existing developed areas. Various CSDPs were developed by the SBCFCD and are available at their office. Similar to MPDs, CSPDs will be referenced as needed to verify storm drain locations and may be used as a tool for identifying potential projects, as planned facilities (new and/or improved) may be incorporated into projects identified and prioritized in the SWRP.

4. Studies and Reports

Information and findings from various studies and reports will be reviewed and referenced in the development of the SWRP as appropriate.

4.1 Annual Water Use Reports

IEUA monitors and compiles water use data from each of its retail agencies to track overall water demands and sources of supply. Each fiscal year, this data is compiled into an Annual Water Use Report. Data includes monthly water use (by member agency and source of supply), a five-year history of water use, and retail agency water usage as a percentage of the total water used in the service area. These reports will be reviewed for information pertaining to water use within the IEUA service area, as this information is required in the SWRP based on the SWRP Guidelines.

4.2 FEMA Flood Insurance Study and Flood Insurance Rate Maps

The Federal Emergency Management Agency (FEMA) prepared a Flood Insurance Study (FIS) for San Bernardino County, California and Incorporated Areas. This study revises and updates information on the existence and severity of flood hazards in the geographic area of San Bernardino County. Flood risk data that is used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management is summarized in the FIS. The FIS includes flow rate information, cross section data, and narrative descriptions of areas that have been assessed for flooding potential. In addition to the FIS, Flood Insurance Rate Maps (FIRMs) are prepared, which illustrate the extent of modeled floodplains. These maps are available through the FEMA website as image files and GIS shapefiles. The FIS and FIRMs will be reviewed to identify areas susceptible to flooding. This information may be used to identify and prioritize projects in the SWRP.

4.3 Preliminary Data Summary of Urban Stormwater Best Management Practices

The Preliminary Data Summary of Urban Stormwater Best Management Practices was prepared by the United States Environmental Protection Agency (USEPA) and includes information on the effects of urban land use as a contributor to acidity and nutrients in stormwater. Additionally, this document makes the case for the atmospheric deposition of nutrients and metals. This report summarizes information and data regarding the effectiveness of BMPs at controlling and reducing pollutants in urban stormwater, expected costs, and environmental benefits. This report describes how urban stormwater runoff is a source of pollutants causing water quality impairments, what those pollutants are, and where they originate from. This information will be utilized throughout the development of the SWRP to identify activities generating or contributing to the contamination of stormwater runoff. BMP design standards will also be reviewed and referenced as appropriate.

4.4 Use Attainability Analysis Cucamonga Creek Reach 1

A Use Attainability Analysis for Cucamonga Creek Reach 1 was prepared in 2013 by the RWQCB. This document explores the possibility of recovering the beneficial uses of Cucamonga Creek. The Use Attainability Analysis describes Reach 1 of Cucamonga Creek in detail, provides information regarding the existing beneficial uses, summarizes the factors that impact the beneficial uses, and identify future uses and the impact of those uses. Additionally, the current characteristics of the impaired creek and potential sources of pollution are discussed along with water quality monitoring data. Information presented in the Use Attainability Analysis will be reviewed and incorporated into the SWRP as appropriate. It is anticipated that the water body characterization and discussion of pollutant sources will be important to the development of the SWRP, specifically relating to the water quality prioritization and identification of potential pollutant sources.

5. GeoTracker

"GeoTracker" is the SWRCB's online database management system to track and archive compliance data from discharges or spills of waste or unauthorized releases of hazardous material from underground storage tanks. A map is produced with a list of sites that impact, or had/have a potential to impact, groundwater quality in California. Also, GeoTracker contains records for various unregulated projects, as well as permitted facilities such as irrigated lands, oil and gas refineries, and other related sites. Information pertaining to both open and closed cases are available through GeoTracker. GeoTracker will be utilized as part of the project evaluation and prioritization phase of the SWRP development to identify if a project that involves infiltration will negatively impact groundwater supply due to existing contamination.

6. Geographic Information System Data

GIS software is designed to capture, store, manipulate, analyze, manage, and present spatial data. There are various sources of GIS data available within the SBC SARW area that will be referenced and utilized throughout the SWRP development. GIS data gathered may be used for analysis and/or creating

figures. Data from the County of San Bernardino's Geographic Information Management System will be utilized to support the development of the SWRP. Data taken from this database includes county boundary, land use, jurisdictional boundaries, and subwatershed boundaries. Data was also pulled from other governmental GIS databases. The following GIS data will be reviewed from various sources and incorporated as appropriate: floodplains, groundwater basins, impairments, soil conditions, storm drains, topography, water bodies, etc. Some examples of sources other than San Bernardino County include, but are not limited to, FEMA, Department of Water Resources (DWR), SAWPA, United States Geological Survey (USGS), and more.

7. Total Maximum Daily Load

TMDL requirements and supporting technical documents will be utilized during the development of the SWRP, including, but not limited to, Basin Plan Amendments (BPAs) and TMDL Staff Reports.

7.1 Big Bear Lake Nutrient TMDL

The BPA for the Big Bear Lake Nutrient TMDL includes background information regarding phosphorous, the principle nutrient causing the impairment, sources, and numeric targets (to be applied in all hydrologic conditions) for total phosphorus and response numeric targets for chlorophyll *a*, macrophyte coverage, and percentage of nuisance aquatic vascular plant species. The response numeric targets provide a method of tracking improvements to water quality as a result of reduced loading of phosphorus. The BPA specifies WLAs and LAs for total phosphorus for Big Bear Lake that applies to Dry Hydrologic Conditions. The BPA also specifies an implementation plan for nutrient reduction that includes compliance schedules for the numeric targets, WLAs, and LAs. The BPA outlines requirements associated with a monitoring program, which has been incorporated into the Big Bear Lake Watershed-Wide Nutrient Monitoring Program, as described in **Section 3.2.2**, which is used to track progress toward compliance. In addition to the BPA, a Staff Report is available, which provides additional details regarding the findings presented in the BPA. These documents will be referenced throughout the development of the SWRP, as the SWRP will consider objectives and schedules established by TMDLs. Additionally, projects and programs will be made consistent to TMDL documents.

7.2 Big Bear Lake and Rathbun Creek Draft Sedimentation/Siltation TMDLs Technical Staff Report

The Staff Report on the Sediment TMDL for Big Bear Lake and Rathbun Creek was prepared in 2005 to support the development of a TMDL. The Staff Report was created to assess the sources of sedimentation and siltation impairments in Big Bear Lake and Rathbun Creek. The Staff Report provides information on the land uses tributary to both Big Bear Lake and Rathbun Creek. References are made to weathering, mass-wasting, and watershed erosion processes to explain the impairments. Additionally, a link between sedimentation and nutrient impairment is made. A BPA/TMDL was never finalized and approved for Big Bear Lake and Rathbun Creek for sedimentation/siltation; however, this report will be reviewed for information regarding the source assessment conducted, as this information may be applicable to the SWRP.

7.3 Big Bear Lake Technical Support Document for Mercury TMDL

The Big Bear Lake Technical Support Document for Mercury TMDL was prepared in 2008 for the SWRCB and USEPA. This document describes the possible sources of mercury loading into Big Bear Lake and the techniques used to quantify loads from each source. Local and regional monitoring data coupled with model output for Big Bear Lake Watershed were used to estimate loading from wet and dry atmospheric deposition and watershed sources (water column and sediment bound). The Technical Report finds that the MS4 was not a significant source of mercury in the lake. This document will be reviewed and referenced as appropriate throughout the development of the SWRP, specifically in regards to the water quality evaluation and source assessment. A BPA/TMDL was never finalized and approved for Big Bear Lake for mercury; however, this report will be reviewed for information regarding the source assessment conducted, as this information may be applicable to the SWRP.

7.4 Middle Santa Ana River Watershed Bacterial Indicator TMDL

The BPA for the MSAR Bacterial Indicator TMDL includes background information regarding the fecal coliform impairment, potential sources, and numeric targets to be achieved in the MSAR. The BPA also includes the USEPA requirement of the states to evaluate and incorporate Escherichia coliform (*E. coli*) as water quality standards based on its "Ambient Water Quality Criteria for Bacteria - 1986." The BPA specifies alternative numeric targets for *E. coli* to be achieved in the MSAR. The amendment specifies Wet and Dry Season TMDLs, WLAs for point sources, and LAs for fecal coliform and *E.coli*. Included in the amendment is an implementation plan for bacterial reduction, which was incorporated into the CBRP, as described in **Section 3.2.3**. In addition to the BPA, a Staff Report is available, which provides additional details regarding the findings presented in the BPA. These documents will be referenced throughout the development of the SWRP, as the SWRP will consider objectives and schedules established by TMDLs. Additionally, projects and programs will be made consistent to TMDL documents.

8. Additional Data

In addition to the sources identified above, the following additional sources may be referenced as applicable throughout the development of the SWRP. It is anticipated that references in addition to those identified in this TM will be identified throughout the development of the SWRP.

- Clean Water Act Section 303(d) List
- Future MS4 Permits (if made available)
- Other applicable NPDES Permits
- San Bernardino County Areawide Stormwater Program Annual Reports
- Local Implementation Plans (LIPs)
- Applicable laws and ordinances
- Planning documents prepared by local agencies and Non-Governmental Organizations (NGOs)
- Groundwater monitoring data

9. References

Chino Basin Watermaster. September 2013. 2013 Amendment to the 2010 Recharge Master Plan Update. http://www.cbwm.org/docs/engdocs/2013%20Amendment%20to%20the%202010%20RMPU/2013%20Amendment%20to%20the%202010%20RMPU%20%E2%80%93%20Sections%201%20through%208.pdf Referenced April 2017. Prepared by Wildermuth Environmental Inc.

Federal Emergency Management Agency (FEMA). Revised September 2016. Flood Insurance Study.

Federal Emergency Management Agency (FEMA). Flood Insurance Rate Maps. https://msc.fema.gov/portal#. Referenced April 2017

Inland Empire Utilities Agency (IEUA). May 2016 (2016a). 2016 Chino Basin Storm Water Resources Plan Functional Equivalency Document. https://18x37n2ovtbb3434n48jhbs1-wpengine.netdna-ssl.com/wp-content/uploads/2016/05/Chino-Basin-SWRP-20160513.pdf. Referenced April 2017.

Inland Empire Utility Agency (IEUA). 2016 (2016b). IEUA FY 2015-2016 Annual Water Use Report: Retail Agency Water Use and Five Year History. https://18x37n2ovtbb3434n48jhbs1-wpengine.netdna-ssl.com/wp-content/uploads/2017/01/16269-Annual-Water-Use-Report-15-16-20161116.pdf. Referenced April 2017.

Inland Empire Utilities Agency (IEUA). 2016 (2016c). Integrated Water Resources Plan: Water Supply & Climate Change Impacts 2015—2040. https://www.ieua.org/download/integrated-water-resources-plan-2015/. Referenced April 2017.

Inland Empire Utilities Agency (IEUA) and Water Facilities Authority (WFA). June 2016 (2016d). 2015 Urban Water Management Plan. https://18x37n2ovtbb3434n48jhbs1-wpengine.netdna-ssl.com/wp-content/uploads/2016/07/FINAL-IEUA-WFA-2015-UWMP-2016-07-07.pdf. Referenced April 2017. Prepared by Water System Consulting (WCS).

San Bernardino County Areawide Stormwater Program. August 2011. Integrated Watershed Monitoring Program. Submitted to the Santa Ana Regional Water Quality Control Board. Prepared by Larry Walker and Associates. http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/stormwater/docs/sbpermit/iwmp/Revised_IWMP.pdf. Referenced April 2017.

San Bernardino County Areawide Stormwater Program. May 2013 (2013a). Hydromodification Management and Monitoring Plan for the Santa Ana River Watershed Region within the County of San Bernardino. http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/stormwater/docs/sbpermit/wap/Phase2/WAPAppendixH-HMP.pdf. Referenced April 2017.

San Bernardino County Areawide Stormwater Program. May 2013 (2013b). San Bernardino County Watershed Action Plan.

http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/docs/sbpermit/wap/Phase2/WAP-FINAL.pdf. Referenced April 2017.

San Bernardino County Areawide Stormwater Program. August 2014. Report of Waste Discharge. Application for Renewal of the Municipal NPDES Stormwater Permit NPDES Permit No. CAS618036. http://sbcountystormwater.org/wp-content/uploads/2013/10/San-Bernardino-County-2014-ROWD-Final-8.1.14.pdf. Referenced April 2017.

San Bernardino County Areawide Stormwater Program. June 2013. Technical Guidance Document for Water Quality Management Plans. Prepared by CDM Smith. http://www.swrcb.ca.gov/santaana/water_issues/programs/stormwater/docs/sbpermit/wqmp/Final/Final_TGD_WQMP.pdf. Referenced April 2017.

San Bernardino County Areawide Stormwater Program. January 2015. Municipal Stormwater Management Plan. Submitted to the Santa Ana Regional Water Quality Control Board.

San Bernardino County Department of Public Works (SBCDPW). Comprehensive Storm Drain Plans. http://cms.sbcounty.gov/dpw/FloodControl/Planning/MPD.aspx. Referenced April 2017.

San Bernardino County Department of Public Works (SBCDPW). Master Plan of Drainage. http://cms.sbcounty.gov/dpw/FloodControl/Planning/MPD.aspx. Referenced April 2017.

San Bernardino County Flood Control District (SBCFCD). June 2011. Comprehensive Bacteria Reduction Plan. Submitted to the California Regional Water Quality Control Board, Santa Ana Region. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/msar/cbrp/scb/Final_SBCo_CBRP_wAttachments.pdf. Referenced April 2017.

San Bernardino County Flood Control District (SBCFCD). July 2012. Big Bear Lake Nutrient TMDL Compliance Program Watershed-Wide Monitoring Plan. Prepared by Brown and Caldwell.

San Bernardino Valley Municipal Water District (SBVMWD). January 2015. Upper Santa Ana River Watershed Integrated Regional Water Management Plan. http://www.sbvwcd.org/docman-projects/upper-santa-ana-integrated-regional-water-management-plan/3802-usarw-irwmp-2015-ch1-9-final/file.html. Referenced April 2017. Prepared by Water System Consulting (WCS).

San Bernardino Valley Municipal Water District (SBVMWD). June 2016. San Bernardino Valley Regional Urban Water Management Plan. http://www.sbvmwd.com/home/showdocument?id=4196. Referenced April 2017.

Santa Ana Regional Water Quality Control Board (RWQCB). January 2005, most recently updated February 2016. Water Quality Control Plan for the Santa Ana River Basin (8). http://www.swrcb.ca.gov/santaana/water_issues/programs/basin_plan/index.shtml. Referenced April 2017.

Santa Ana Regional Water Quality Control Board (RWQCB). May 2007. Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate Bacterial Indicator Total Maximum Daily

Loads (TMDLs) for Middle Santa Ana River Watershed Waterbodies. http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2005/05_001.pdf. Referenced April 2017.

Santa Ana Regional Water Quality Control Board (RWQCB). January 2010. National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for the San Bernardino County Flood Control District, the County of San Bernardino, and the Incorporated Cities of the San Bernardino County within the Santa Ana Region Area-Wide Urban Stormwater Runoff Management Program. http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2010/10_036_SBC_MS4_Permit_01_29_10.pdf. Referenced April 2017.

Santa Ana Regional Water Quality Control Board (SWRCB). October 2013. Use Attainability Analysis – Cucamonga Creek Reach 1. http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/docs/rec_standards/UAA/Cucamonga_UAA_10-7-13_Final.pdf. Referenced April 2017.

Santa Ana Watershed Project Authority (SAWPA). February 2014. One Water, One Watershed Plan 2.0. http://www.sawpa.org/owow-2-0-plan-2/. Referenced April 2017.

Santa Ana Watershed Project Authority (SAWPA). February 2016. Santa Ana River Watershed Bacteria Monitoring Program. Prepared by CDM Smith. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/msar/Monitoring_QAPP/Final_Monitoring_Plan_February_2016.pdf. Referenced April 2017.

State Water Resources Control Board (SWRCB). July 2005. Big Bear Lake and Rathbun Creek Draft Sedimentation/Siltation TMDLs Technical Report. http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/tmdl/docs/bigbear/sediment/tmdl_sediment_part_2_0705.pdf. Referenced April 2017.

State Water Resources Control Board (SWRCB). October 2008. Big Bear Lake Technical Support Document for Mercury TMDL. http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/docs/bigbear/mercury/tetra_tech_bbl_support_document_10_31_08.pdf. Referenced April 2017.

State Water Resources Control Board (SWRCB). 2015. Storm Water Resource Plan Guidelines. http://www.waterboards.ca.gov/water_issues/programs/grants_loans/swgp/docs/prop1/swrp_finalguidelines_dec2015.pdf.

State Water Resources Control Board (SWRCB). GeoTracker. https://geotracker.waterboards.ca.gov/. Referenced April 2017.

United States Environmental Protection Agency (USEPA). Preliminary Data Summary of Urban Storm Water Best Management Practices. August 1999. https://www3.epa.gov/npdes/pubs/usw_b.pdfhttps://www.epa.gov/sites/production/files/2015-11/documents/urban-stormwater-bmps_preliminary-study_1999.pdf. Referenced April 2017.

Western Municipal Water District (WMWD). May 2008. Western Municipal Water District Integrated Regional Water Management Plan 2008 Update. Prepared by Kennedy/Jenks Consultants. http://www.wmwd.com/DocumentCenter/Home/View/350. Referenced April 2017.

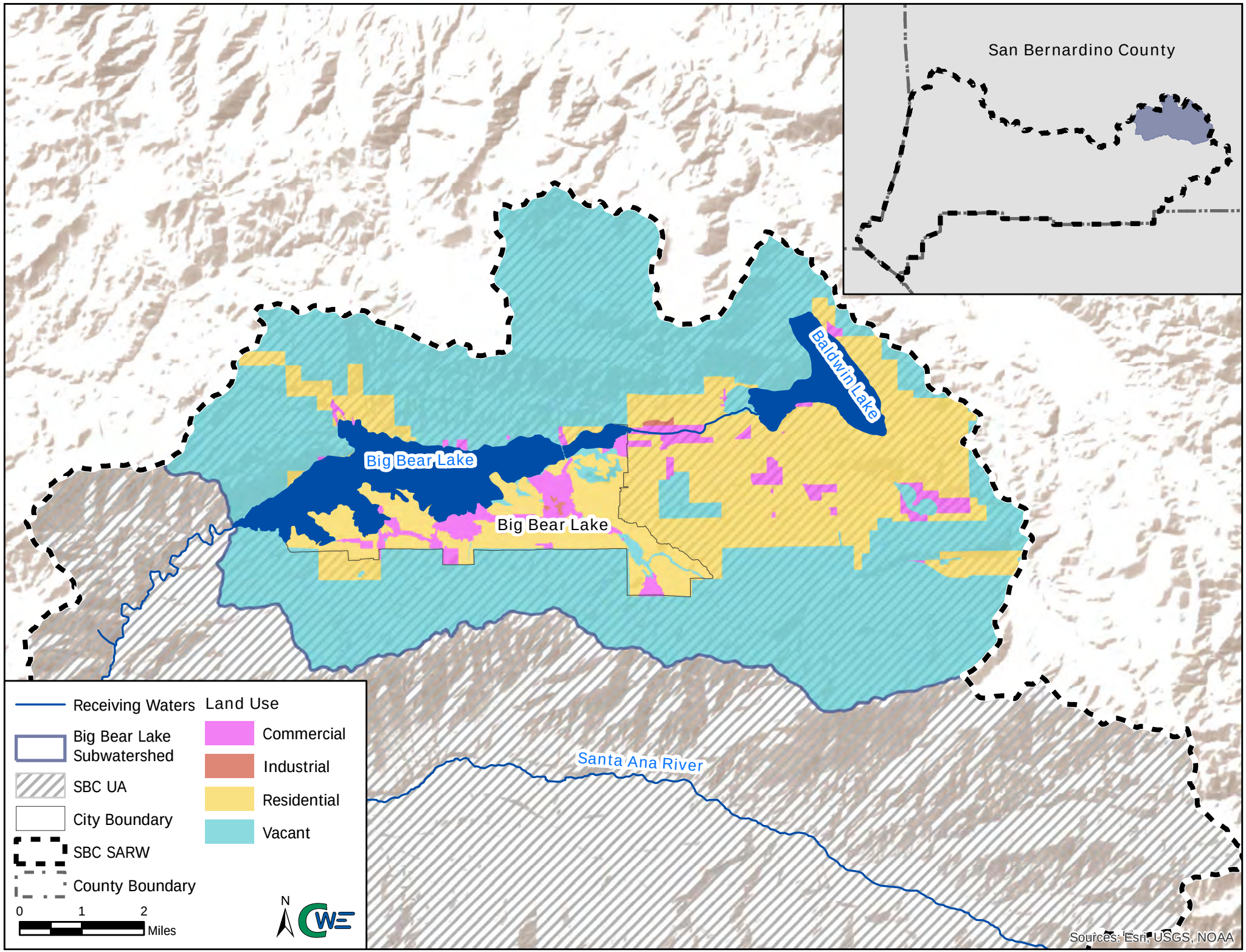
Attachment B

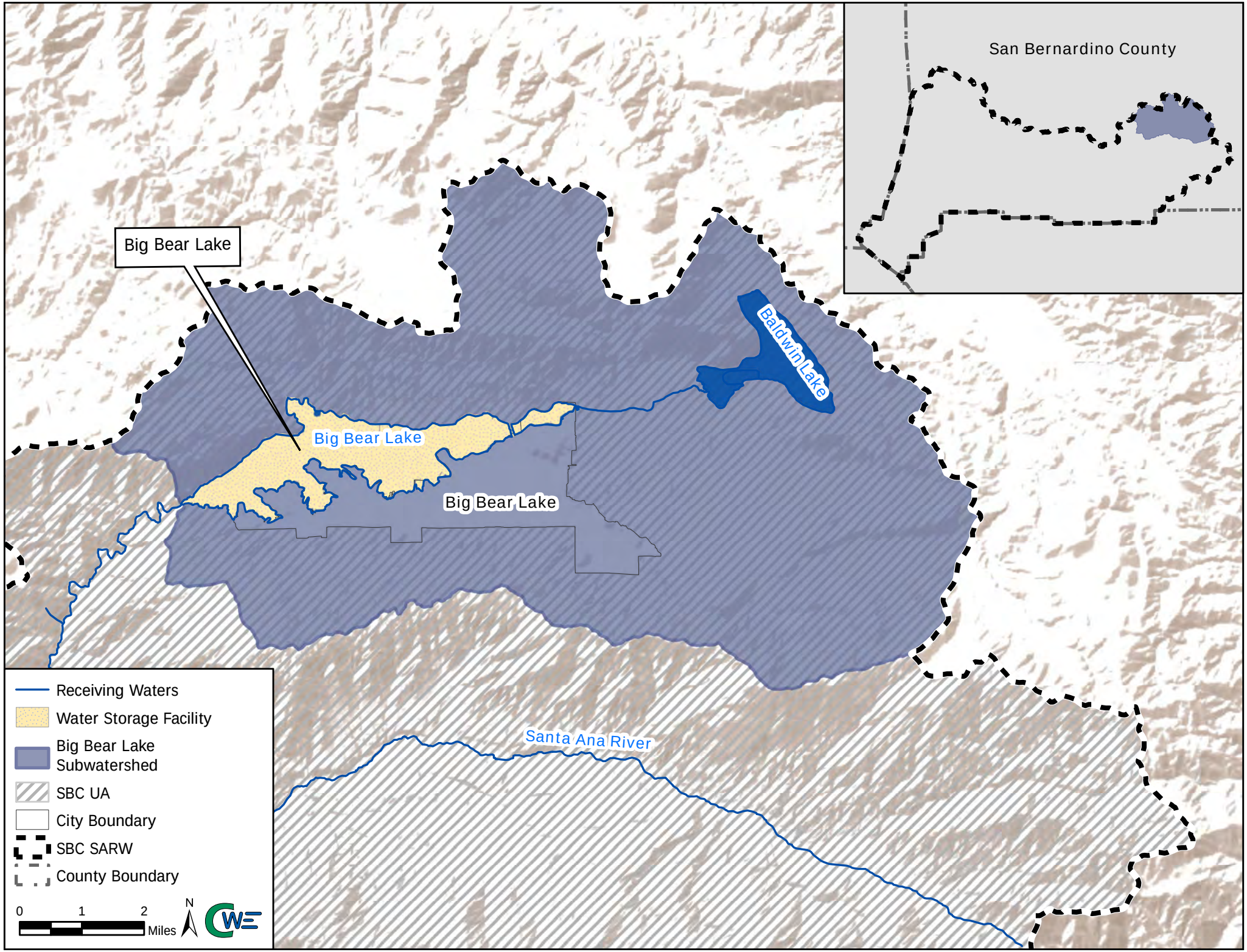
Land Use Categorization Table

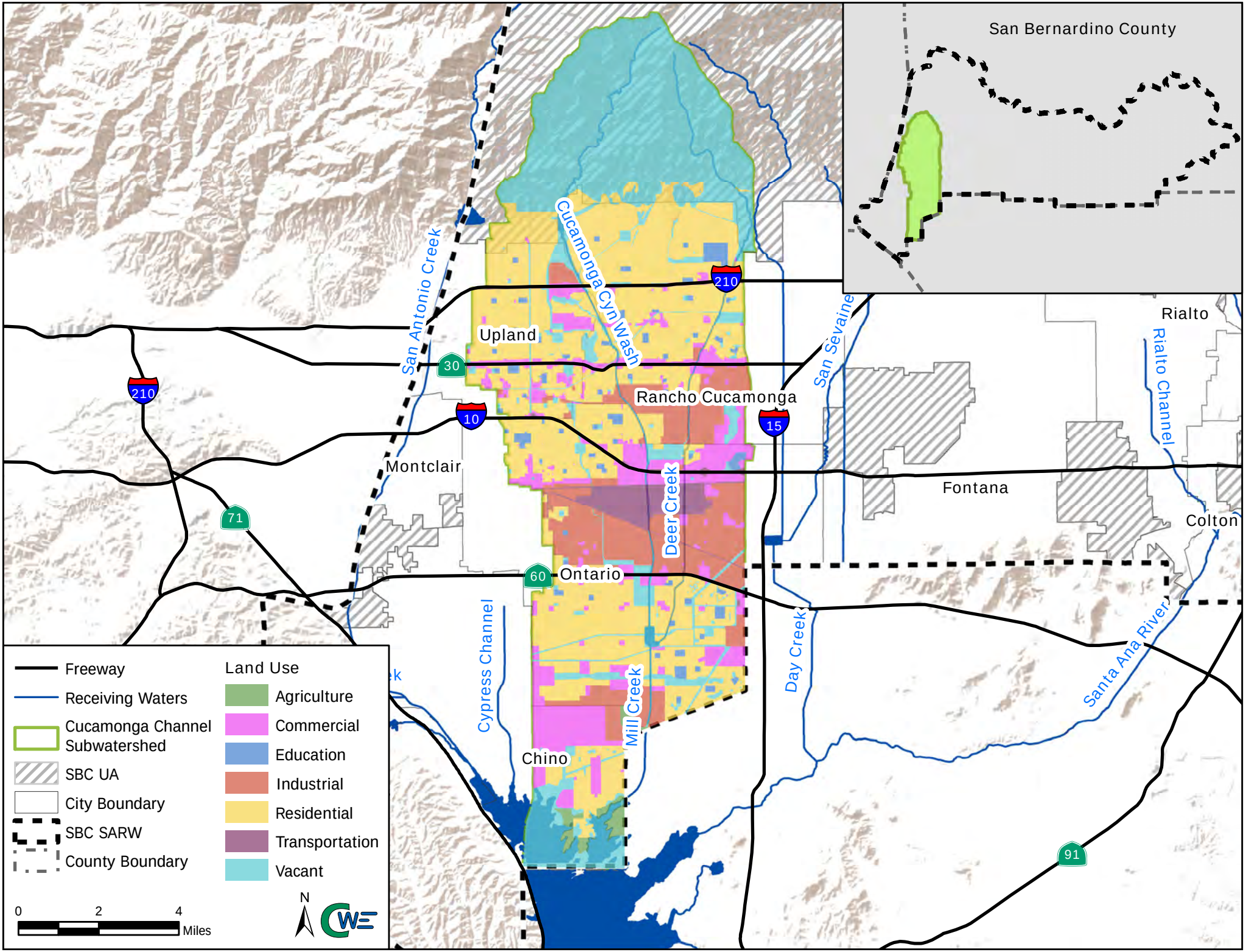
Land Use Description	Re-Categorization
Agriculture	Agriculture
Cemetery	Vacant
College	Education
General Commercial	Commercial
General Industrial	Industrial
Golf Course	Vacant
Heavy Industrial	Industrial
Hotel/Motel	Commercial
Institutions/Government	Commercial
K-12 Schools	Education
Light Industrial	Industrial
Miscellaneous Commercial	Commercial
Miscellaneous Industrial	Industrial
Office	Commercial
Open-Non-developed	Vacant
Other Retail/Service	Commercial
Parks	Vacant
Regional Commercial	Commercial
Residential	Residential
Transportation	Transportation
Urban Mixed	Commercial
Utilities	Vacant

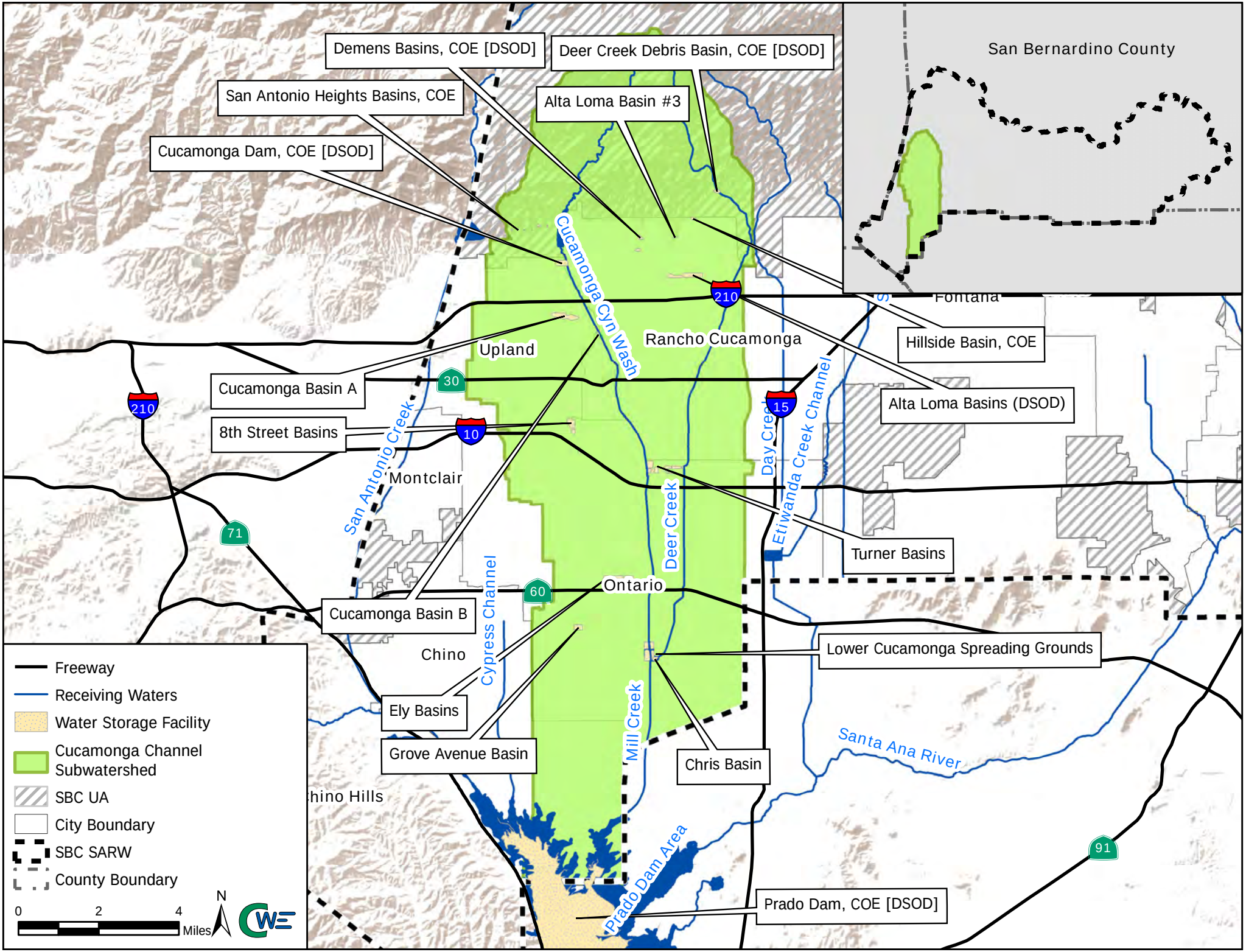
Attachment C

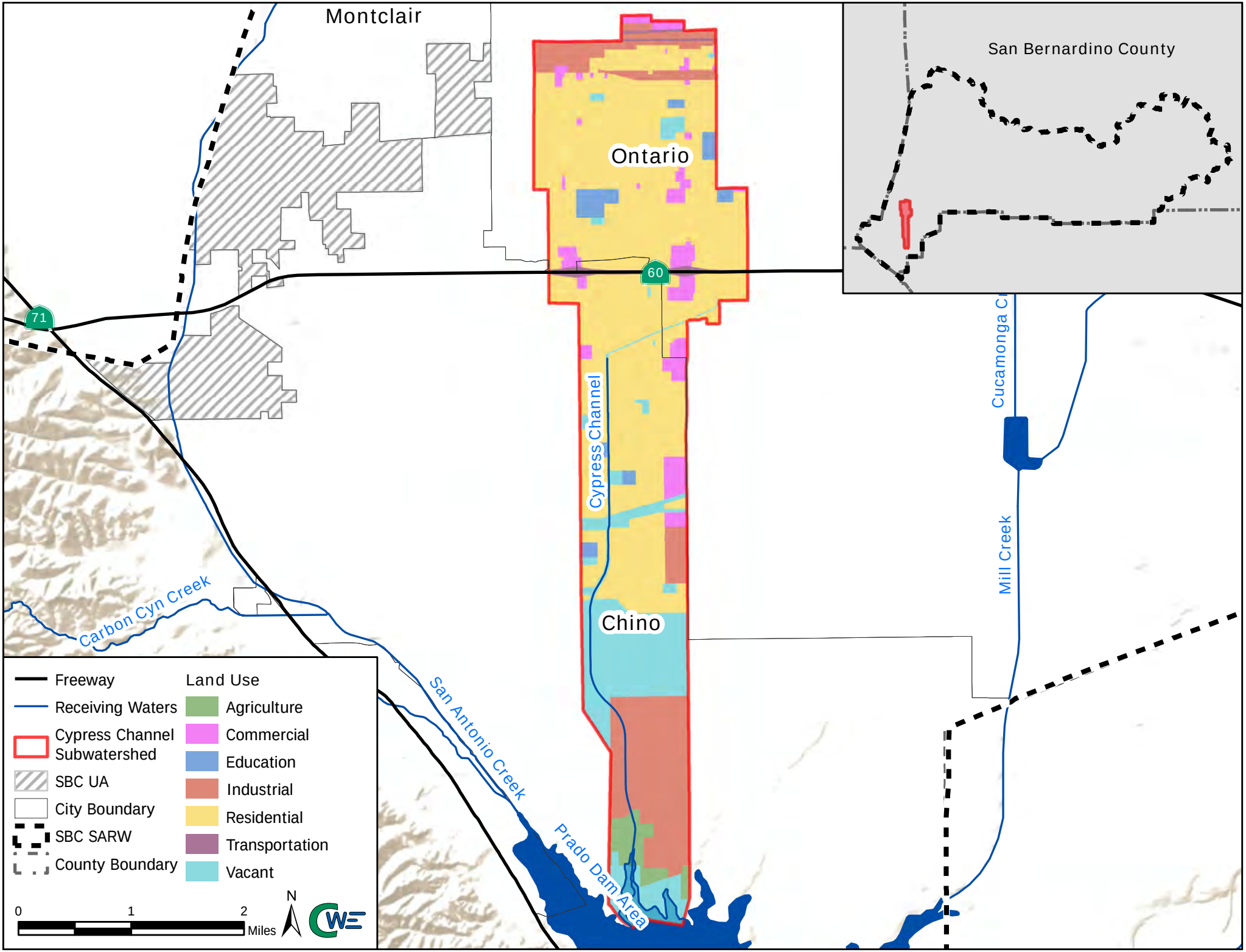
San Bernardino County Santa Ana River Subwatershed Figures

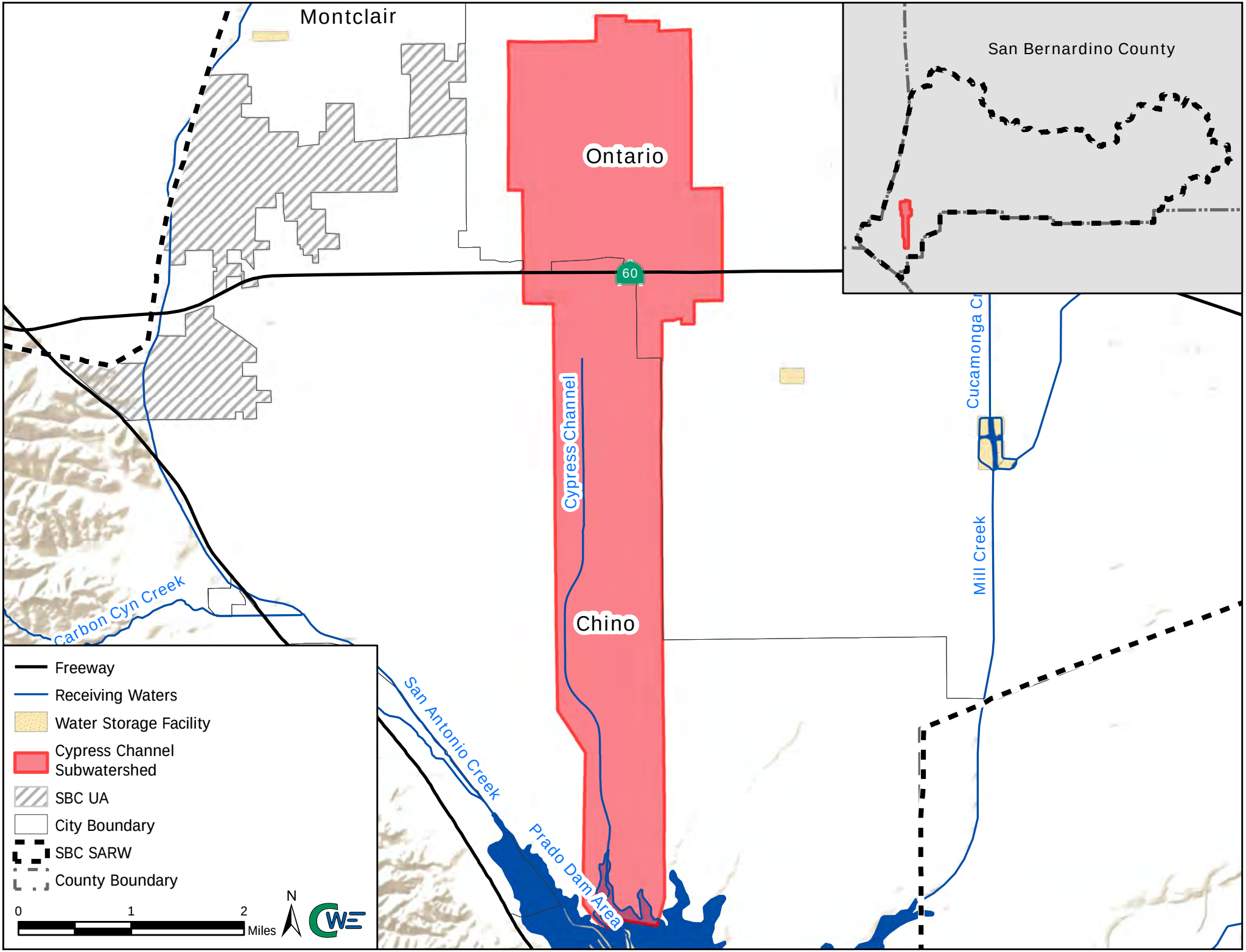

San Bernardino County
Big Bear Lake
Big Bear Lake
Baldwin Lake
Santa Ana River
Receiving Waters
Big Bear Lake Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Industrial
Residential
Vacant
0
1
2
Miles
N
Sources: Esri, USGS, NOAA

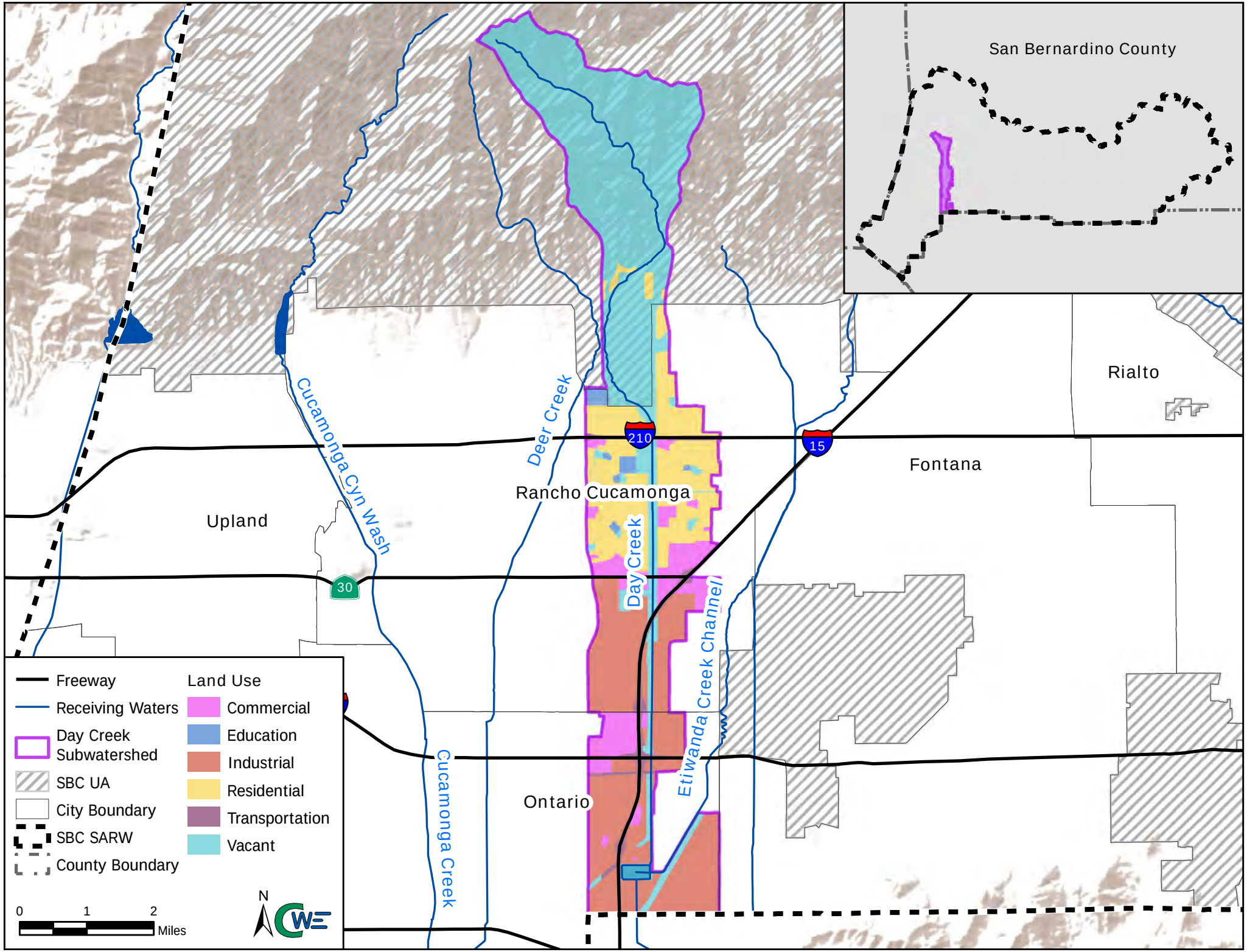

San Bernardino County
Big Bear Lake
Baldwin Lake
Big Bear Lake
Big Bear Lake
Santa Ana River
Receiving Waters
Water Storage Facility
Big Bear Lake Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

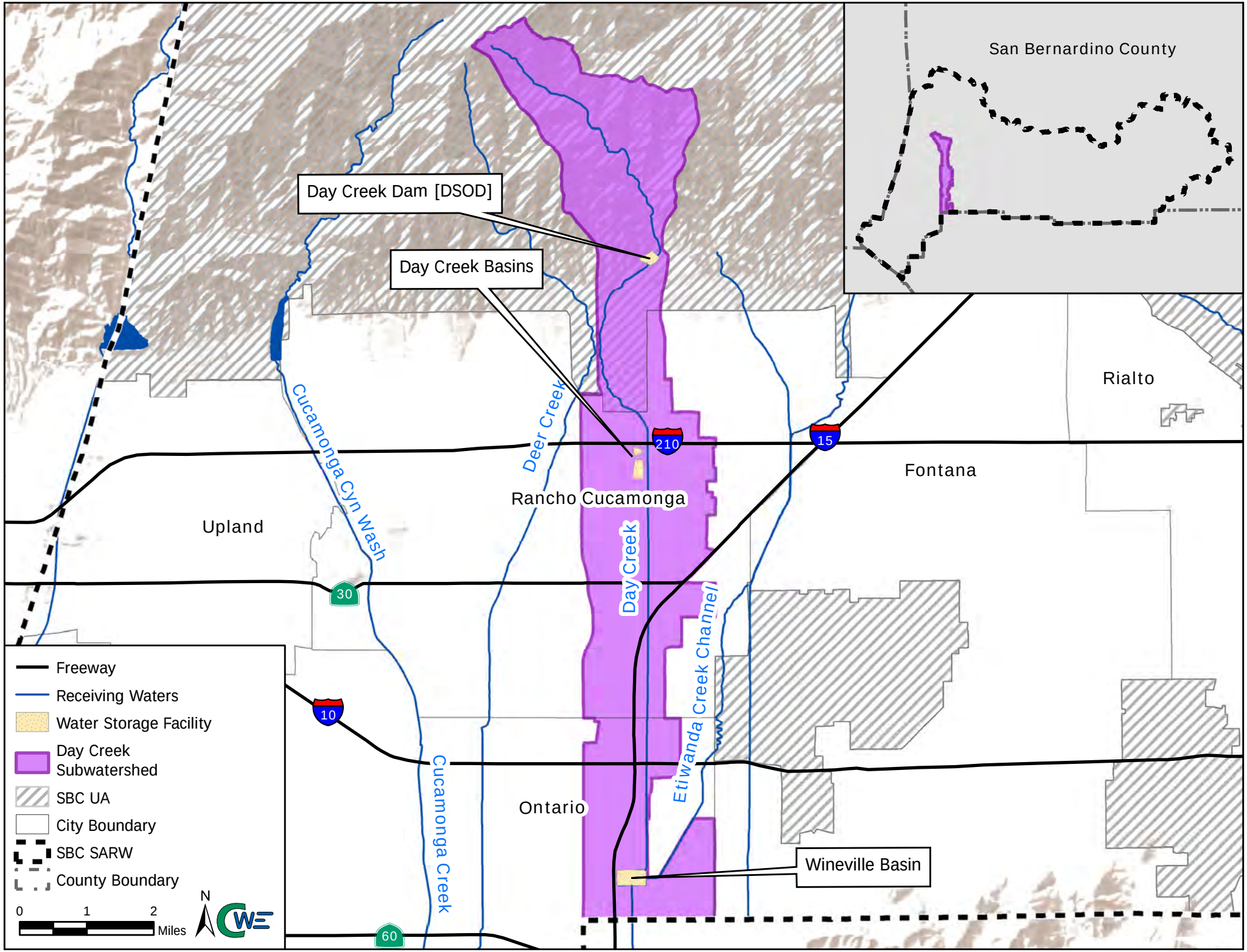

San Bernardino County
Upland
Rancho Cucamonga
Montclair
Ontario
Chino
Fontana
Rialto
Colton
San Antonio Creek
Cucamonga Cyn Wash
San Sevaine
Rialto Channel
Deer Creek
Cypress Channel
Mill Creek
Day Creek
Santa Ana River
210
30
10
15
71
60
91
Freeway
Receiving Waters
Cucamonga Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
2
4
Miles
N

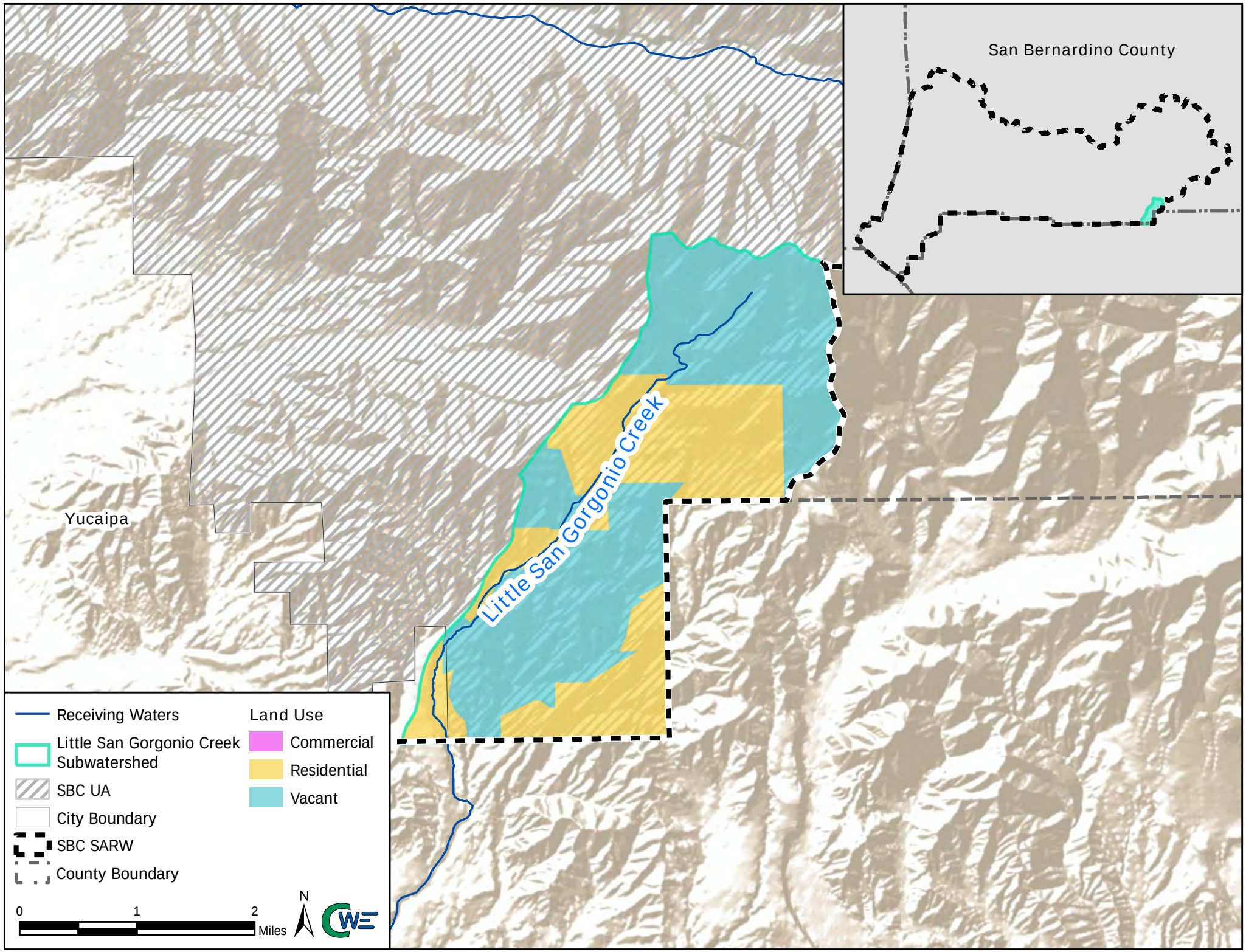

Demens Basins, COE [DSOD]
Deer Creek Debris Basin, COE [DSOD]
San Antonio Heights Basins, COE
Alta Loma Basin #3
Cucamonga Dam, COE [DSOD]
San Bernardino County
Cucamonga Cyn Wash
Fontana
Hillside Basin, COE
Upland
Rancho Cucamonga
Cucamonga Basin A
Alta Loma Basins (DSOD)
8th Street Basins
San Antonio Creek
Day Creek
Etiwanda Creek Channel
Montclair
Deer Creek
Turner Basins
Cypress Channel
Ontario
Cucamonga Basin B
Lower Cucamonga Spreading Grounds
Chino
Ely Basins
Mill Creek
Grove Avenue Basin
Chris Basin
Santa Ana River
Prado Dam Area
Prado Dam, COE [DSOD]
210
30
10
15
60
71
91
Freeway
Receiving Waters
Water Storage Facility
Cucamonga Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
2
4
Miles
N

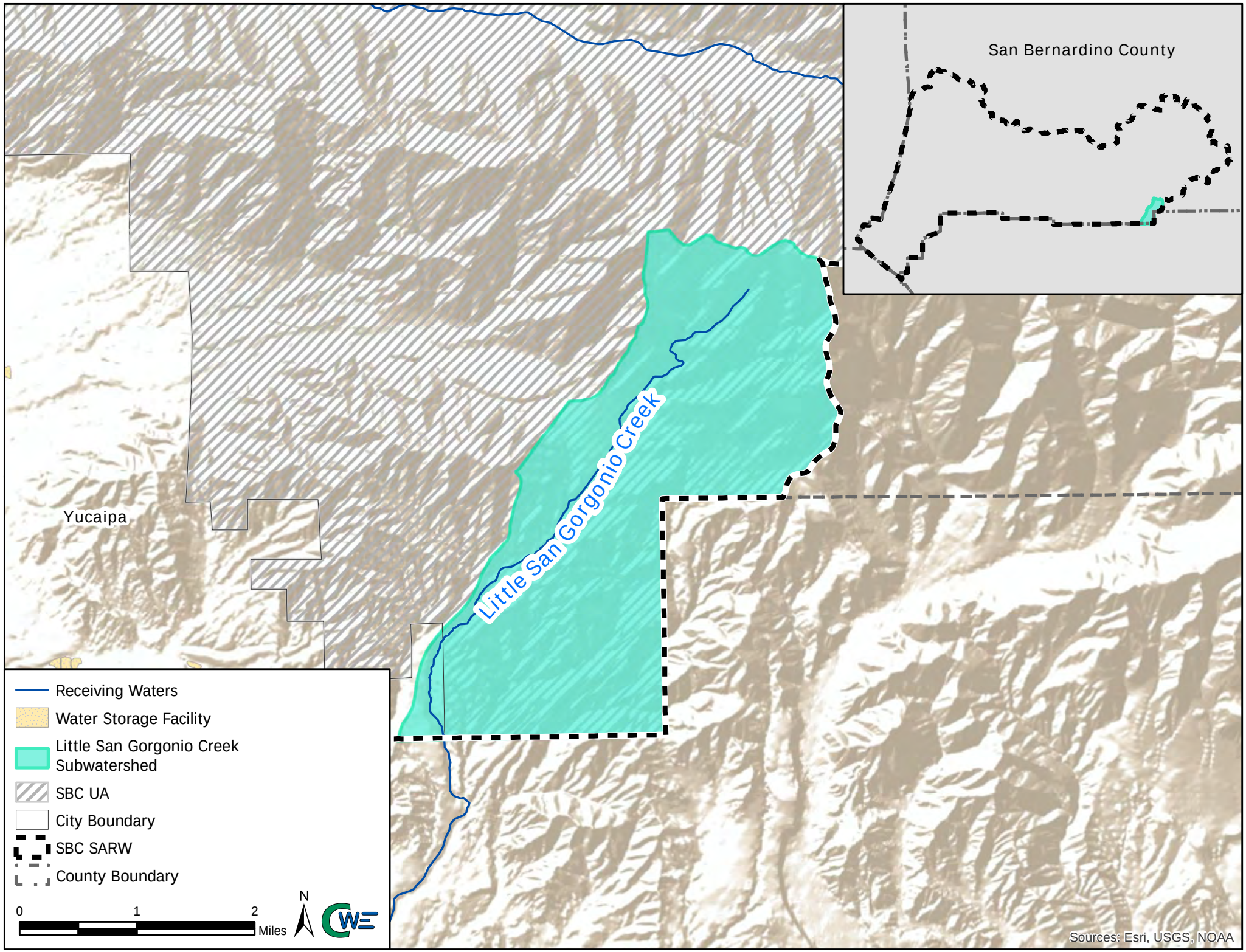

Montclair
Ontario
Chino
San Bernardino County
60
71
Cypress Channel
Cucamonga C
Mill Creek
Carbon Cyn Creek
San Antonio Creek
Prado Dam Area
Freeway
Receiving Waters
Cypress Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1
2
Miles
N

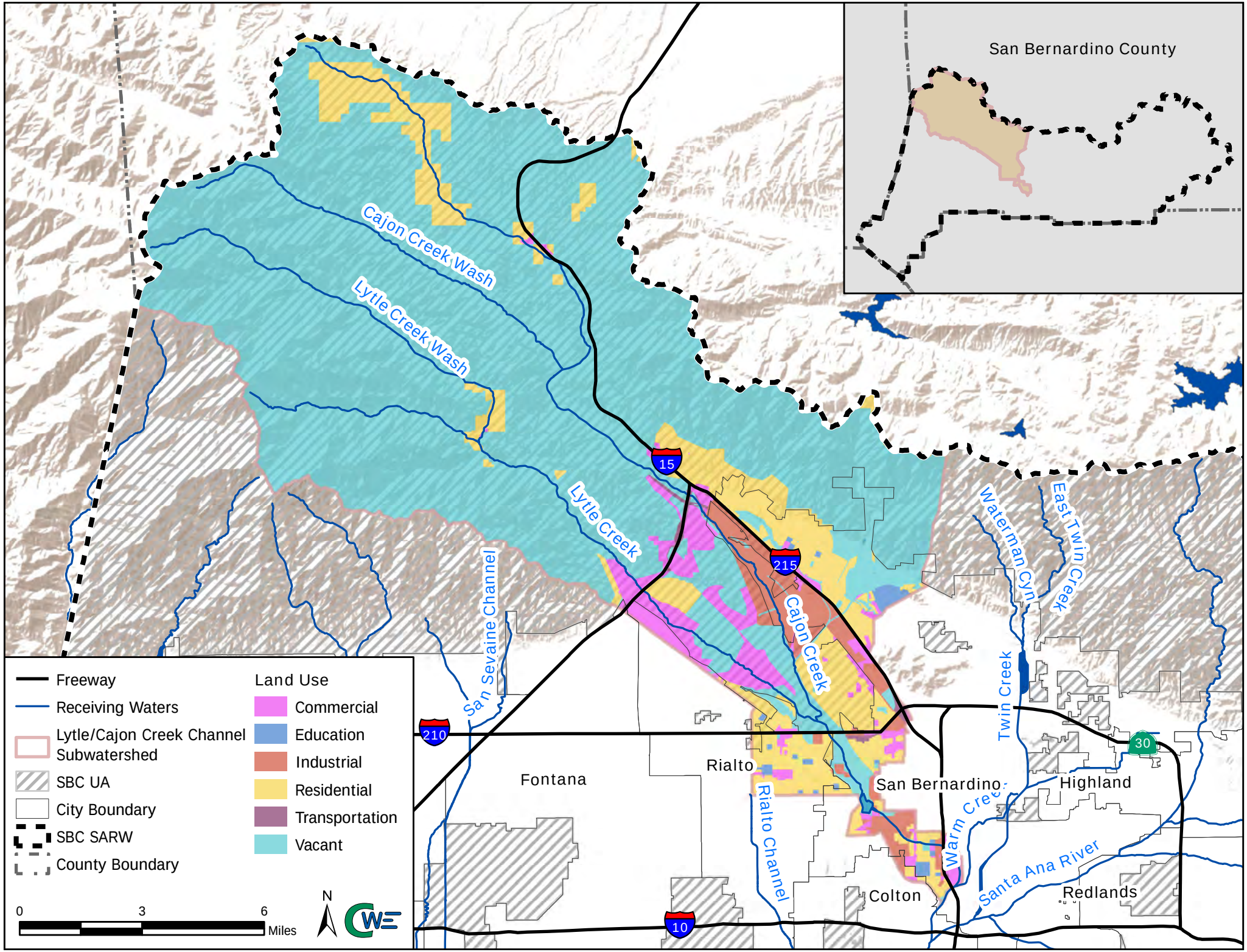

Montclair
Ontario
Chino
60
San Bernardino County
Cypress Channel
Cucamonga Cr
Mill Creek
Carbon Cyn Creek
San Antonio Creek
Prado Dam Area
Freeway
Receiving Waters
Water Storage Facility
Cypress Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

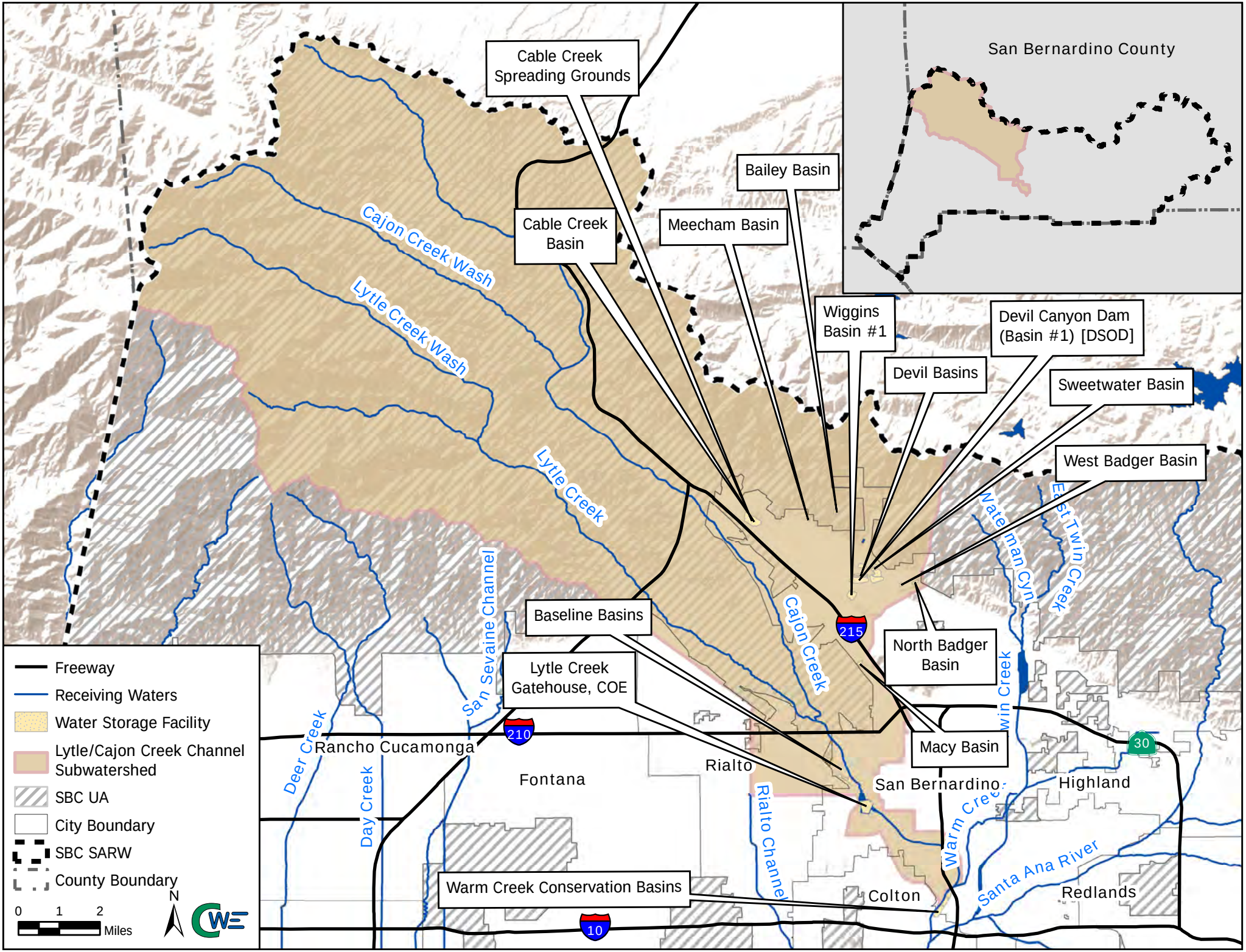

San Bernardino County
Rialto
Fontana
Rancho Cucamonga
Upland
Ontario
Deer Creek
Cucamonga Cyn Wash
Day Creek
Etiwanda Creek Channel
Cucamonga Creek
210
15
30
Freeway
Receiving Waters
Day Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
N
0
1
2
Miles

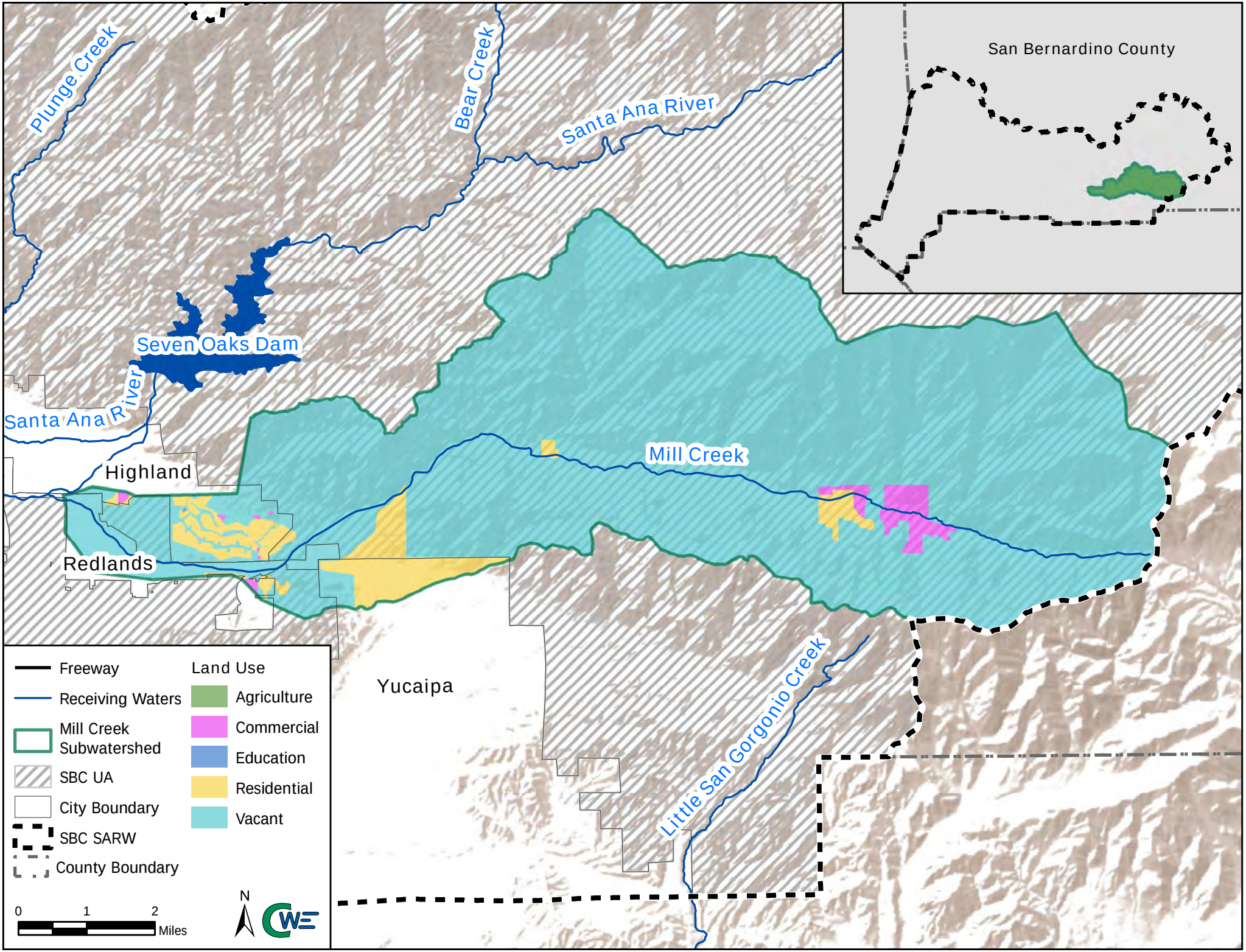

San Bernardino County
Day Creek Dam [DSOD]
Day Creek Basins
Cucamonga Cyn Wash
Deer Creek
Rialto
210
15
Fontana
Rancho Cucamonga
Upland
Day Creek
Etiwanda Creek Channel
30
10
Cucamonga Creek
Ontario
Wineville Basin
60
Freeway
Receiving Waters
Water Storage Facility
Day Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

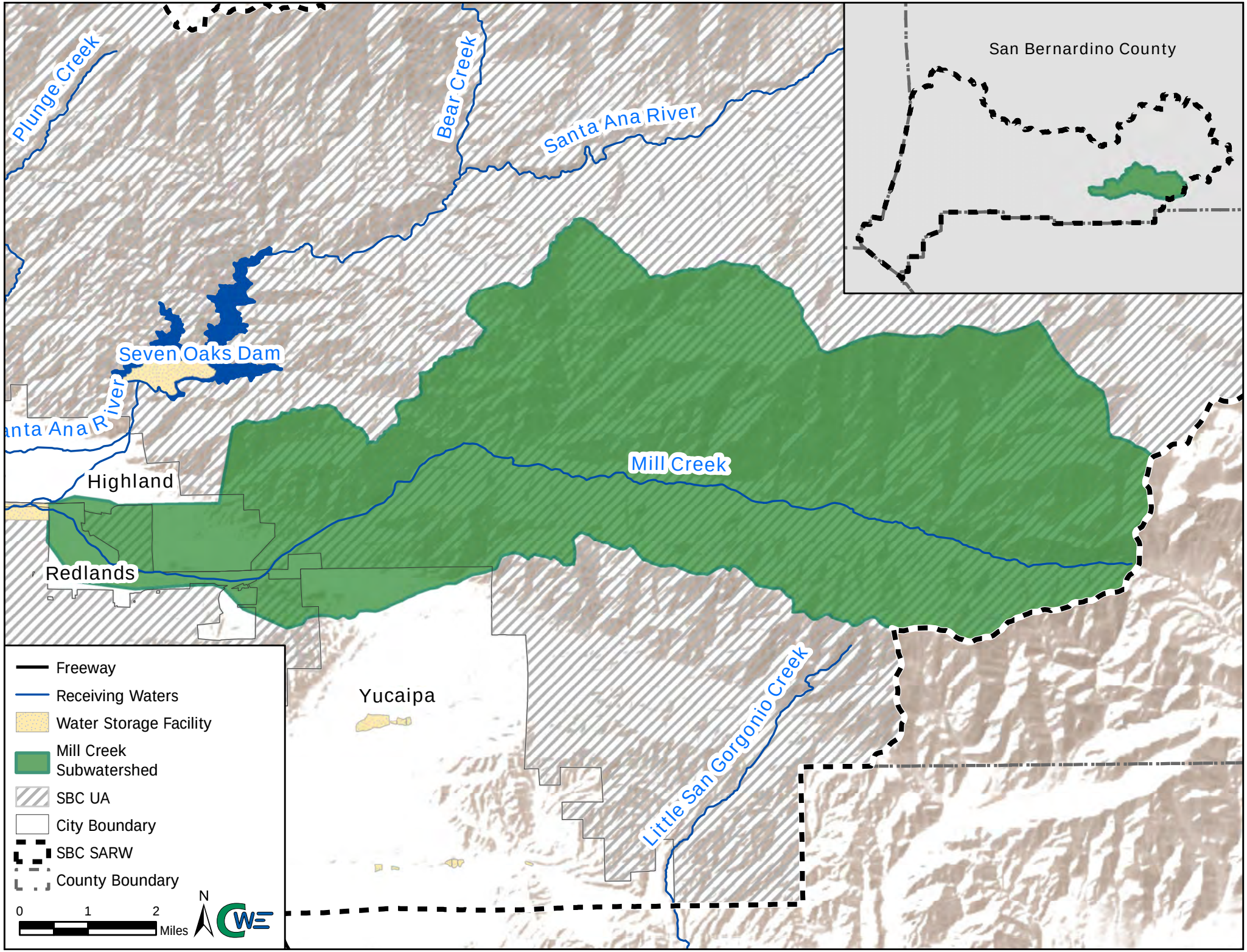

San Bernardino County
Yucaipa
Little San Gorgonio Creek
Receiving Waters
Little San Gorgonio Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Residential
Vacant
0
1
2
Miles
N

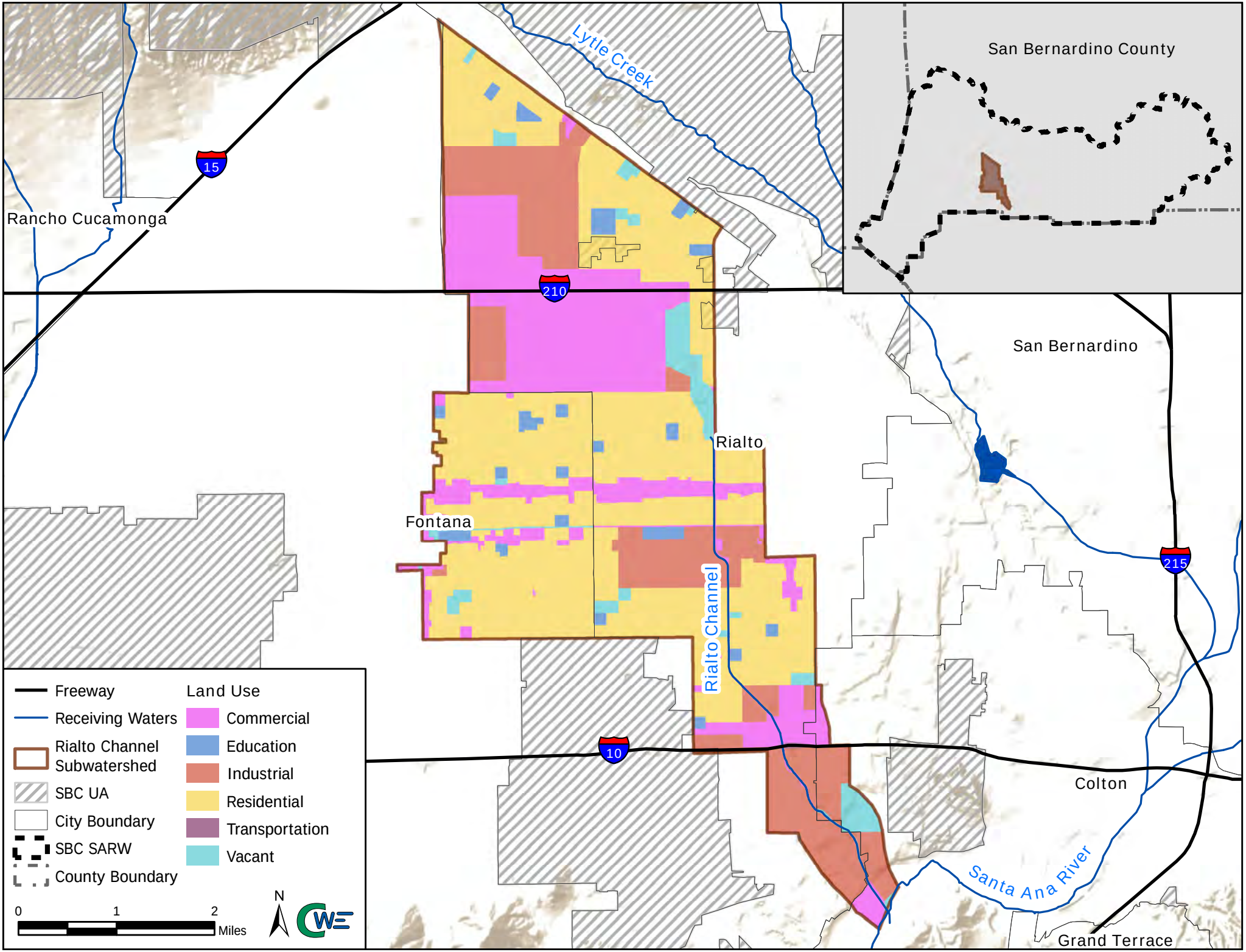

San Bernardino County
Little San Gorgonio Creek
Yucaipa
Receiving Waters
Water Storage Facility
Little San Gorgonio Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N
Sources: Esri, USGS, NOAA

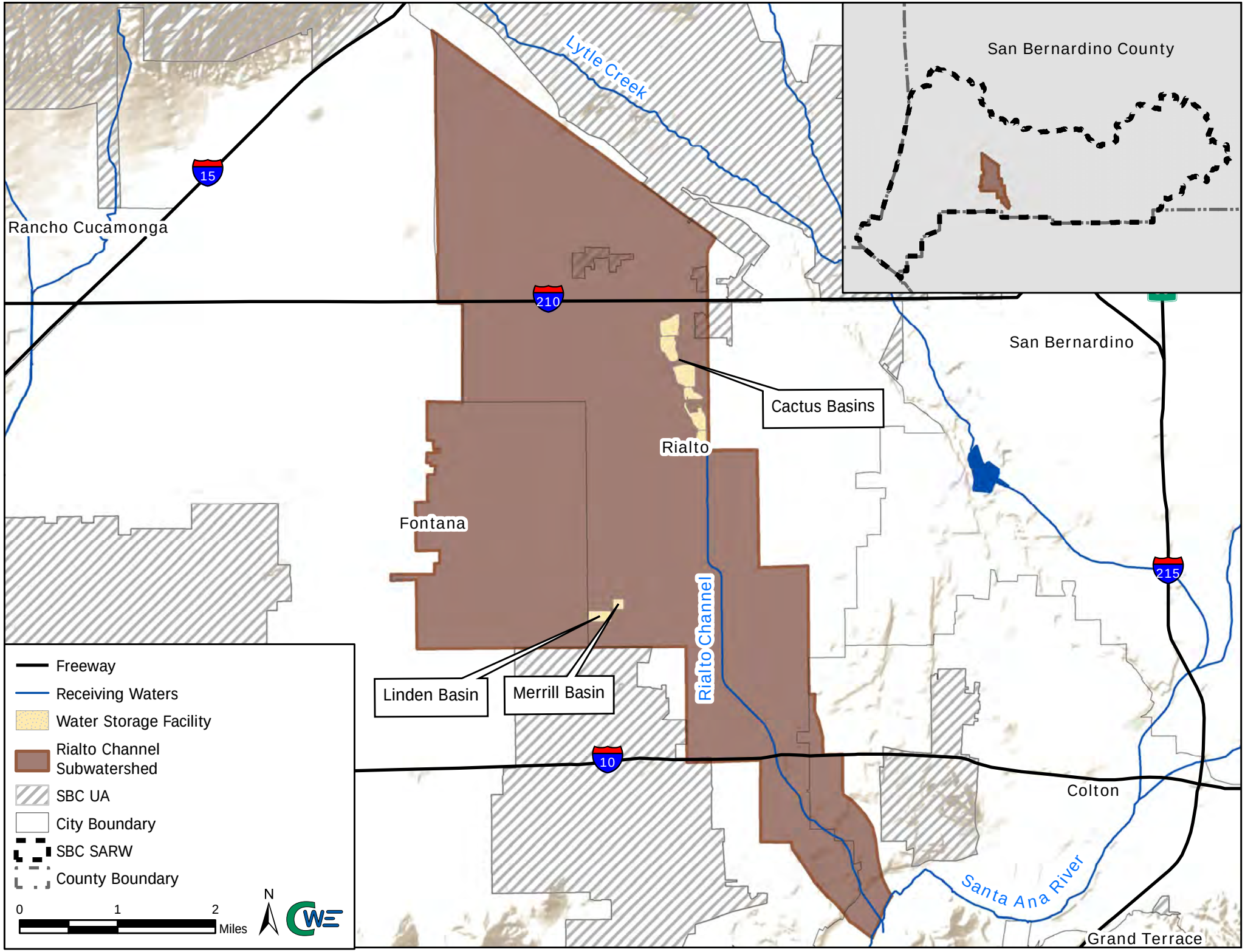

San Bernardino County
Cajon Creek Wash
Lytle Creek Wash
Lytle Creek
San Sevaine Channel
Cajon Creek
Waterman Cyn
East Twin Creek
Twin Creek
Warm Creek
Rialto Channel
Santa Ana River
Fontana
Rialto
San Bernardino
Highland
Colton
Redlands
15
215
210
10
30
Freeway
Receiving Waters
Lytle/Cajon Creek Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
3
6
Miles
N

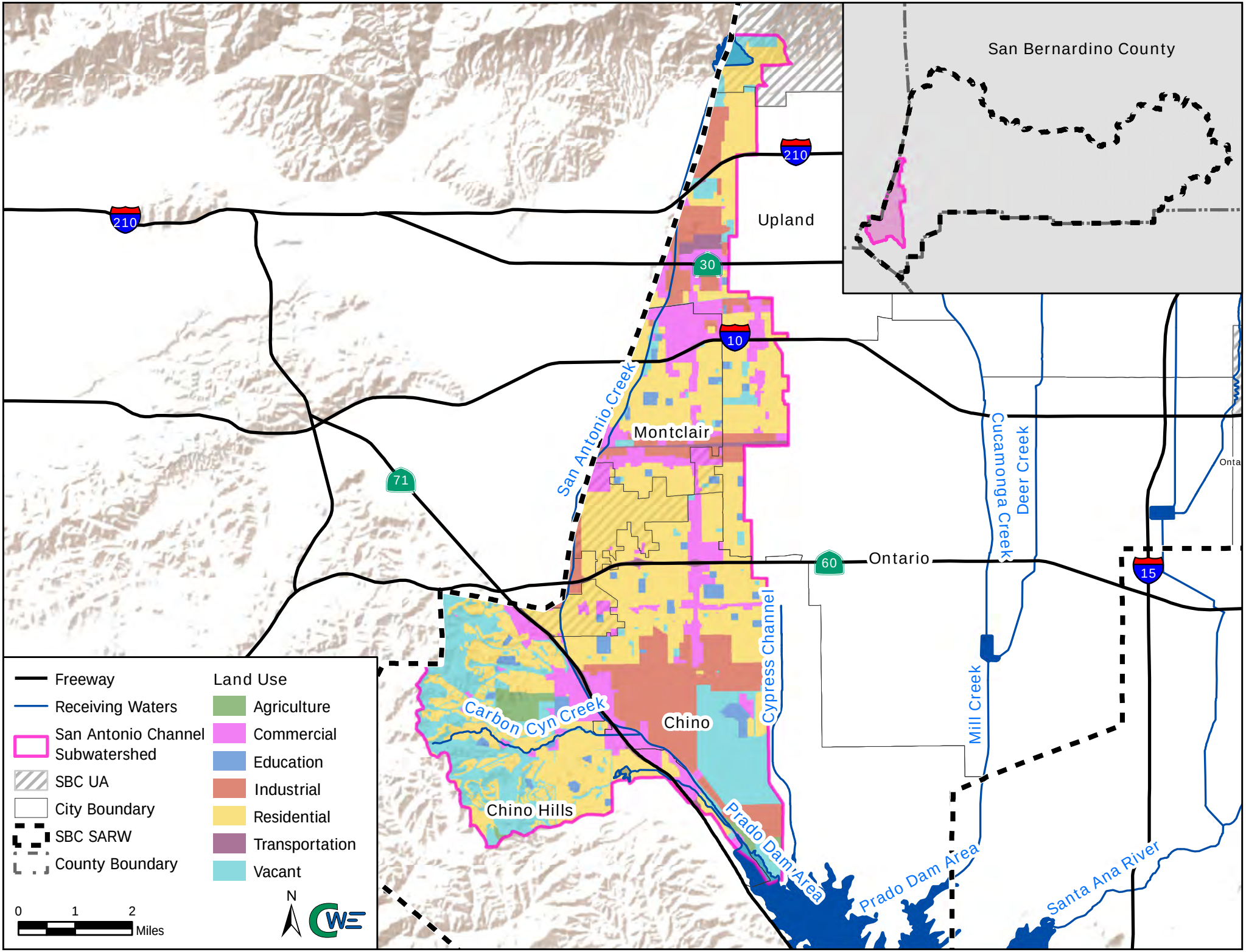

San Bernardino County
Cable Creek Spreading Grounds
Bailey Basin
Cable Creek Basin
Meecham Basin
Wiggins Basin #1
Devil Canyon Dam (Basin #1) [DSOD]
Devil Basins
Sweetwater Basin
West Badger Basin
Cajon Creek Wash
Lytle Creek Wash
Lytle Creek
Waterman Cyn
East Twin Creek
Twin Creek
Baseline Basins
Lytle Creek Gatehouse, COE
North Badger Basin
Macy Basin
San Sevaine Channel
Cajon Creek
Deer Creek
Day Creek
Rancho Cucamonga
Fontana
Rialto
San Bernardino
Highland
Colton
Redlands
Rialto Channel
Warm Creek
Santa Ana River
Warm Creek Conservation Basins
210
215
10
30
Freeway
Receiving Waters
Water Storage Facility
Lytle/Cajon Creek Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
N
0 1 2
Miles

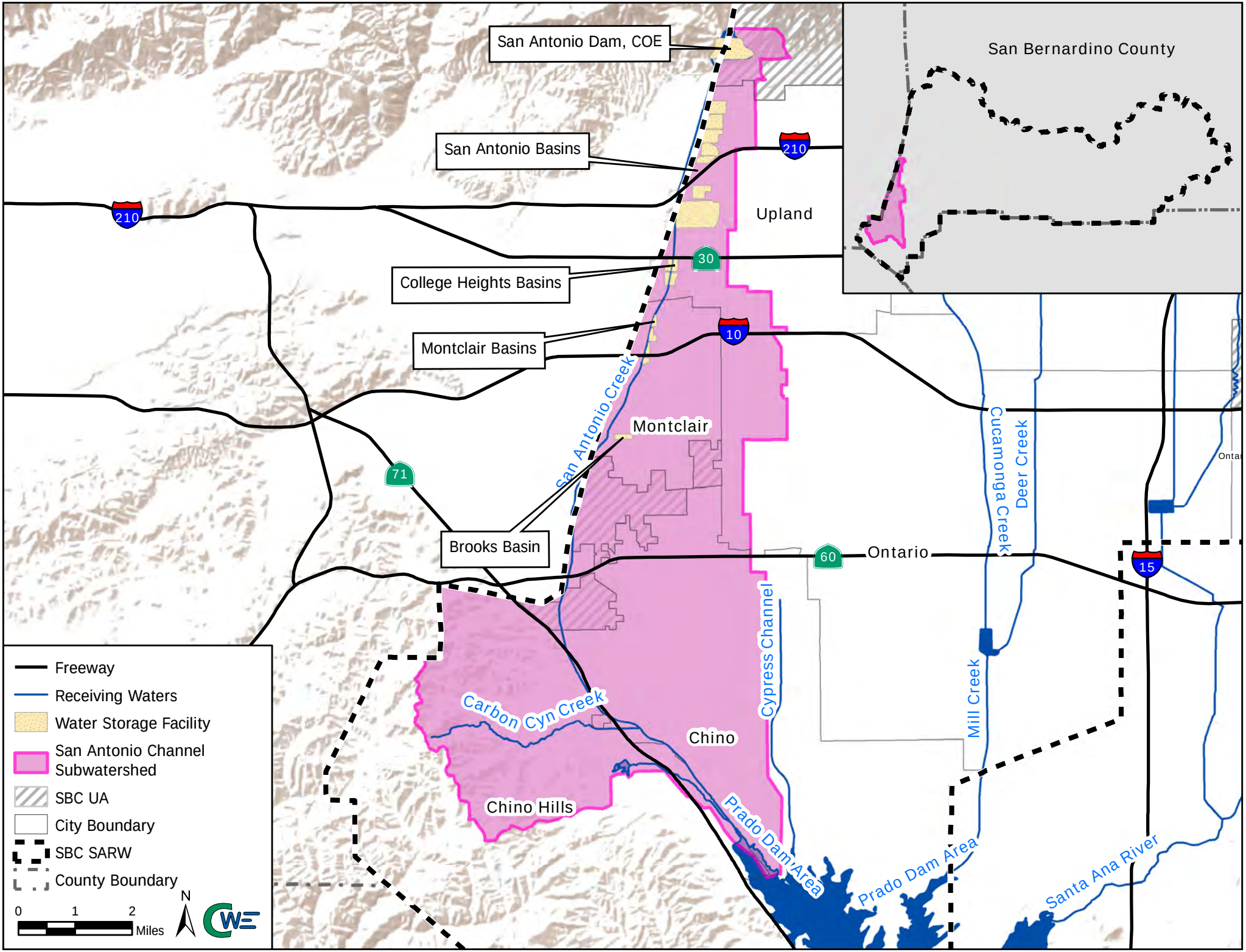

Plunge Creek
Bear Creek
Santa Ana River
Seven Oaks Dam
Santa Ana River
Highland
Mill Creek
Redlands
Yucaipa
Little San Gorgonio Creek
San Bernardino County
Freeway
Receiving Waters
Mill Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Residential
Vacant
0
1
2
Miles
N

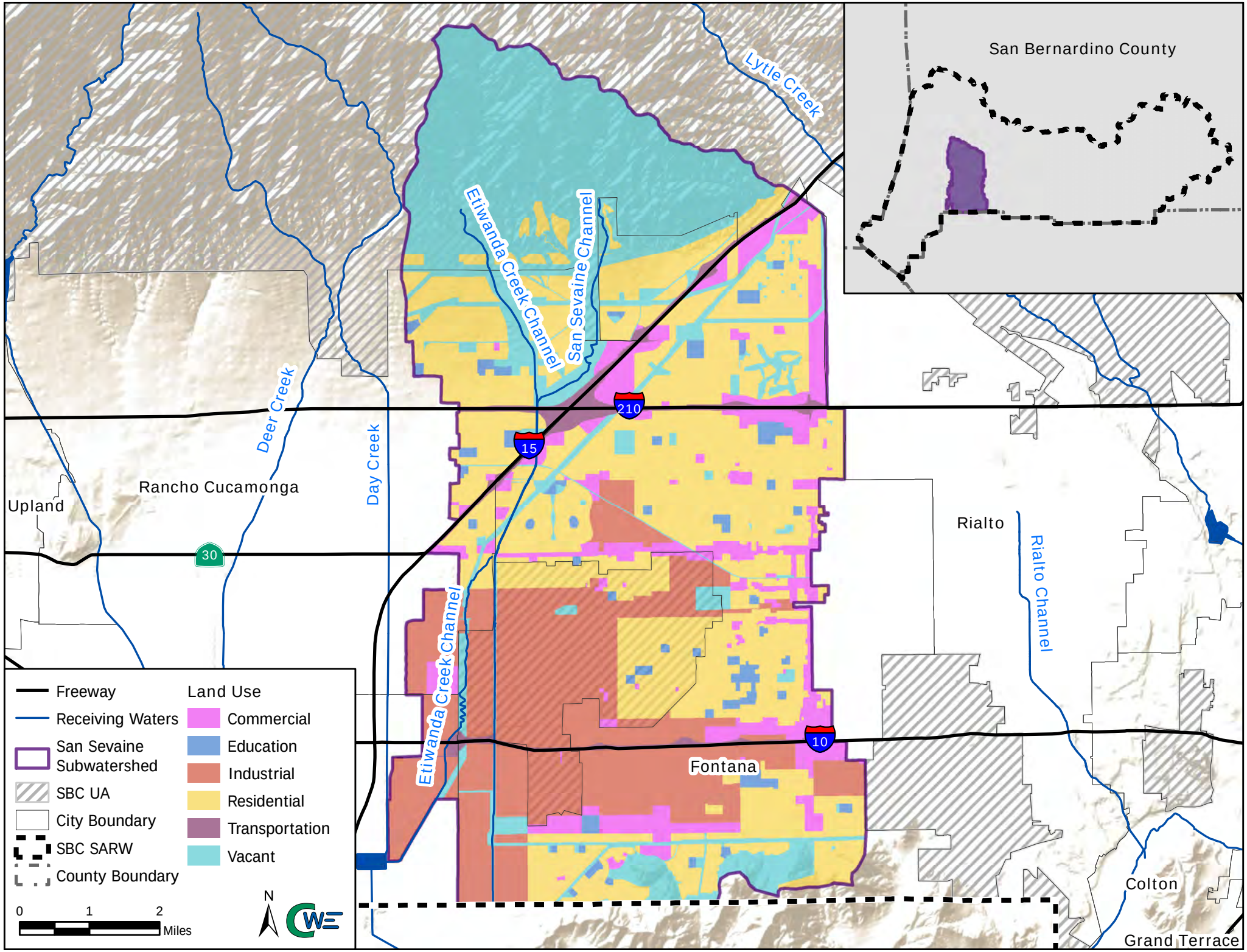

Plunge Creek
Bear Creek
Santa Ana River
Seven Oaks Dam
anta Ana River
Highland
Mill Creek
Redlands
Yucaipa
Little San Gorgonio Creek
San Bernardino County
Freeway
Receiving Waters
Water Storage Facility
Mill Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

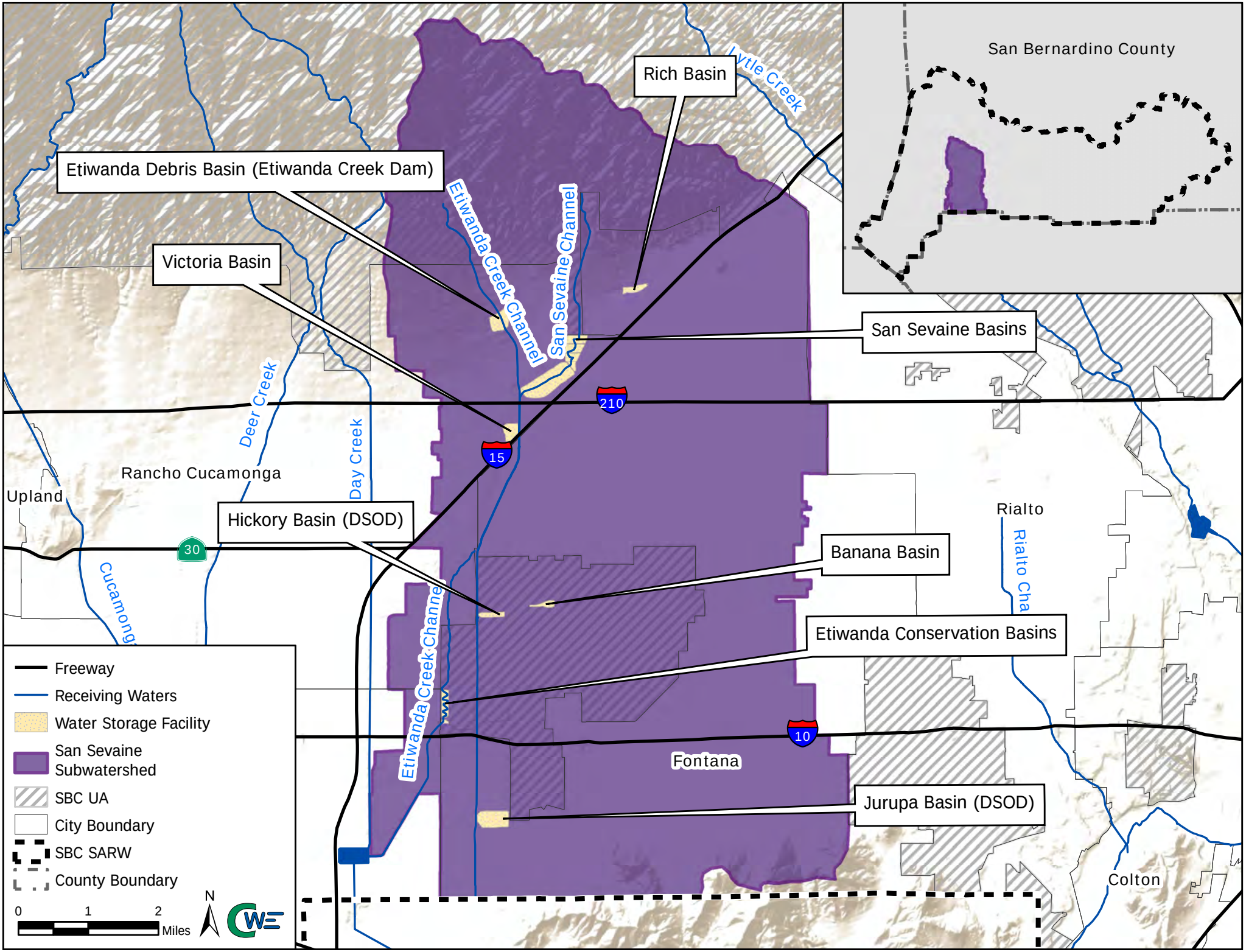

Lytle Creek
San Bernardino County
Rancho Cucamonga
15
210
San Bernardino
Rialto
Fontana
Rialto Channel
215
10
Colton
Santa Ana River
Grand Terrace
Freeway
Receiving Waters
Rialto Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1
2
Miles
N

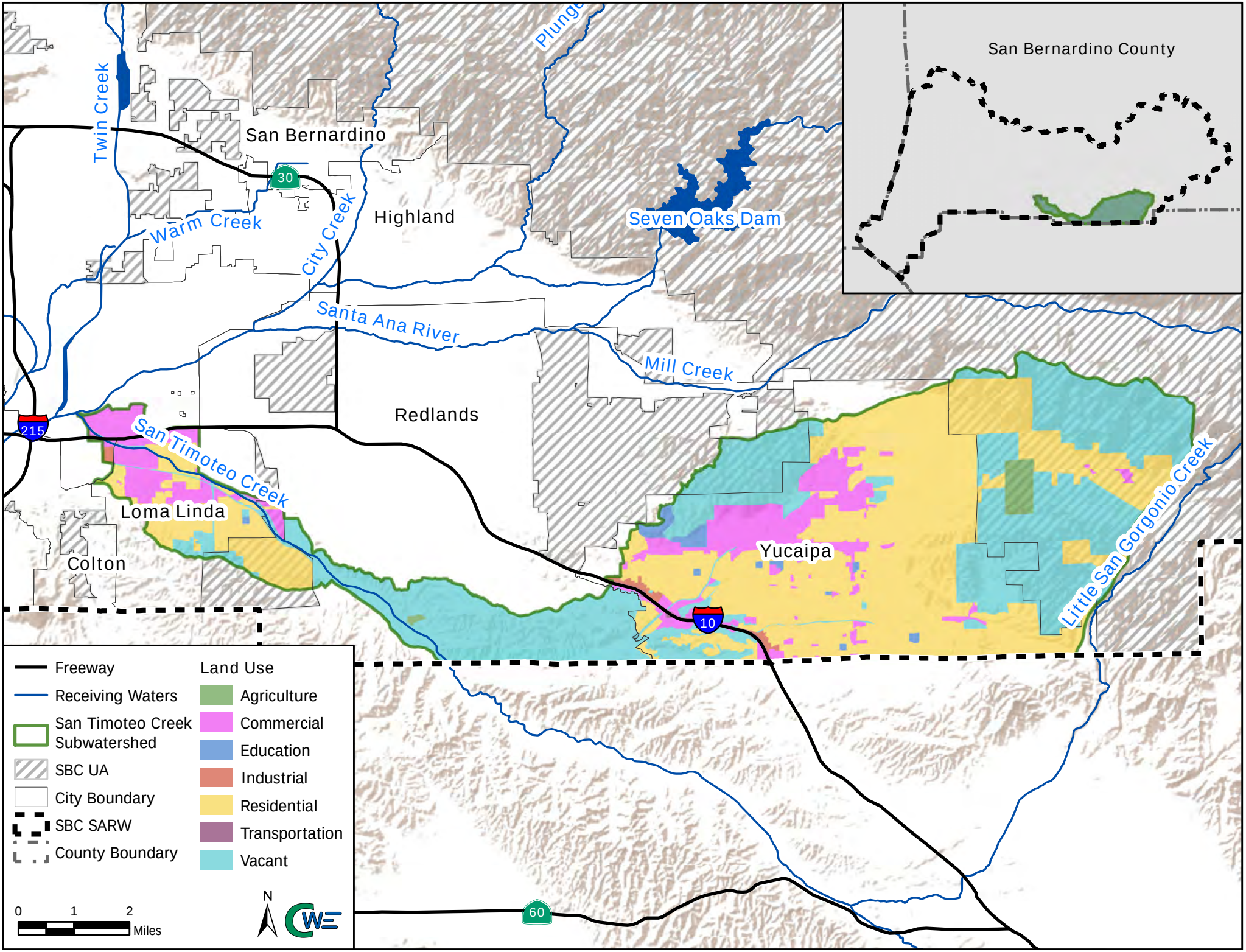

San Bernardino County
Lytle Creek
15
Rancho Cucamonga
210
San Bernardino
Cactus Basins
Rialto
Fontana
Rialto Channel
215
Linden Basin
Merrill Basin
10
Colton
Santa Ana River
Grand Terrace
Freeway
Receiving Waters
Water Storage Facility
Rialto Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

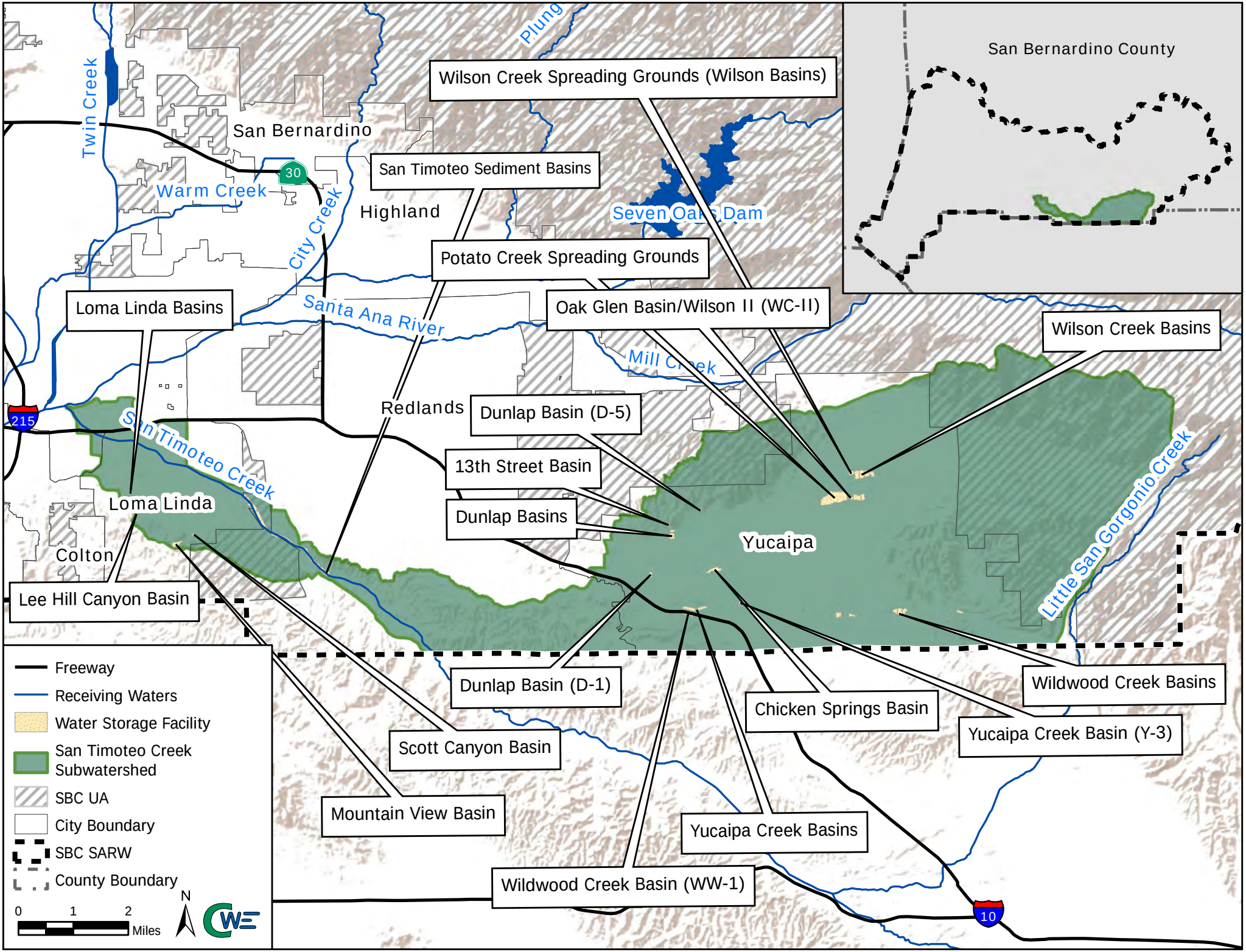

San Bernardino County
Upland
Montclair
Ontario
Chino
Chino Hills
210
30
10
71
60
15
San Antonio Creek
Cucamonga Creek
Deer Creek
Cypress Channel
Mill Creek
Carbon Cyn Creek
Prado Dam Area
Santa Ana River
Freeway
Receiving Waters
San Antonio Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1
2
Miles
N

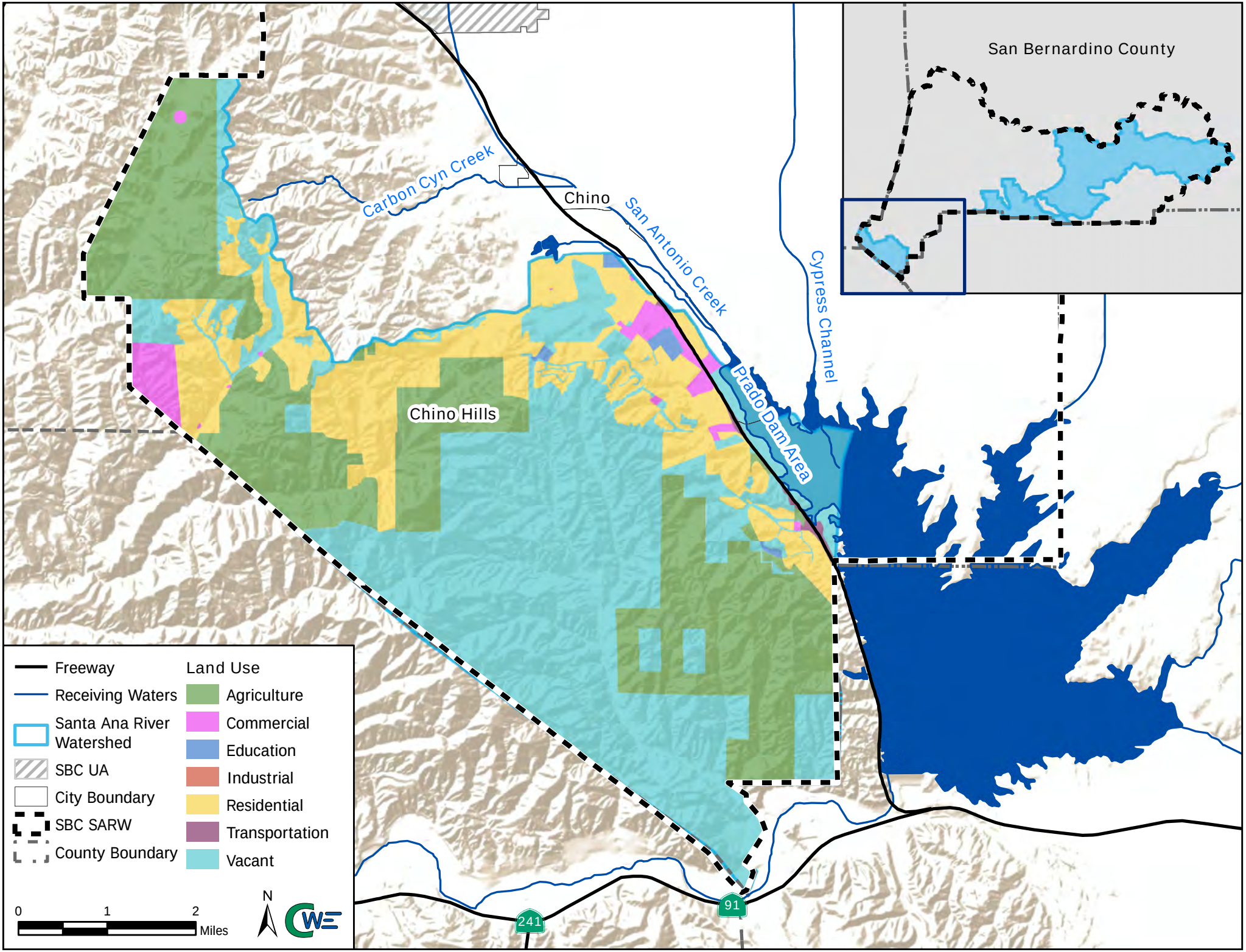

San Antonio Dam, COE
San Antonio Basins
College Heights Basins
Montclair Basins
Brooks Basin
Upland
Montclair
Ontario
Chino
Chino Hills
San Antonio Creek
Carbon Cyn Creek
Cypress Channel
Cucamonga Creek
Deer Creek
Mill Creek
Prado Dam Area
Santa Ana River
210
30
10
71
60
15
San Bernardino County
Freeway
Receiving Waters
Water Storage Facility
San Antonio Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

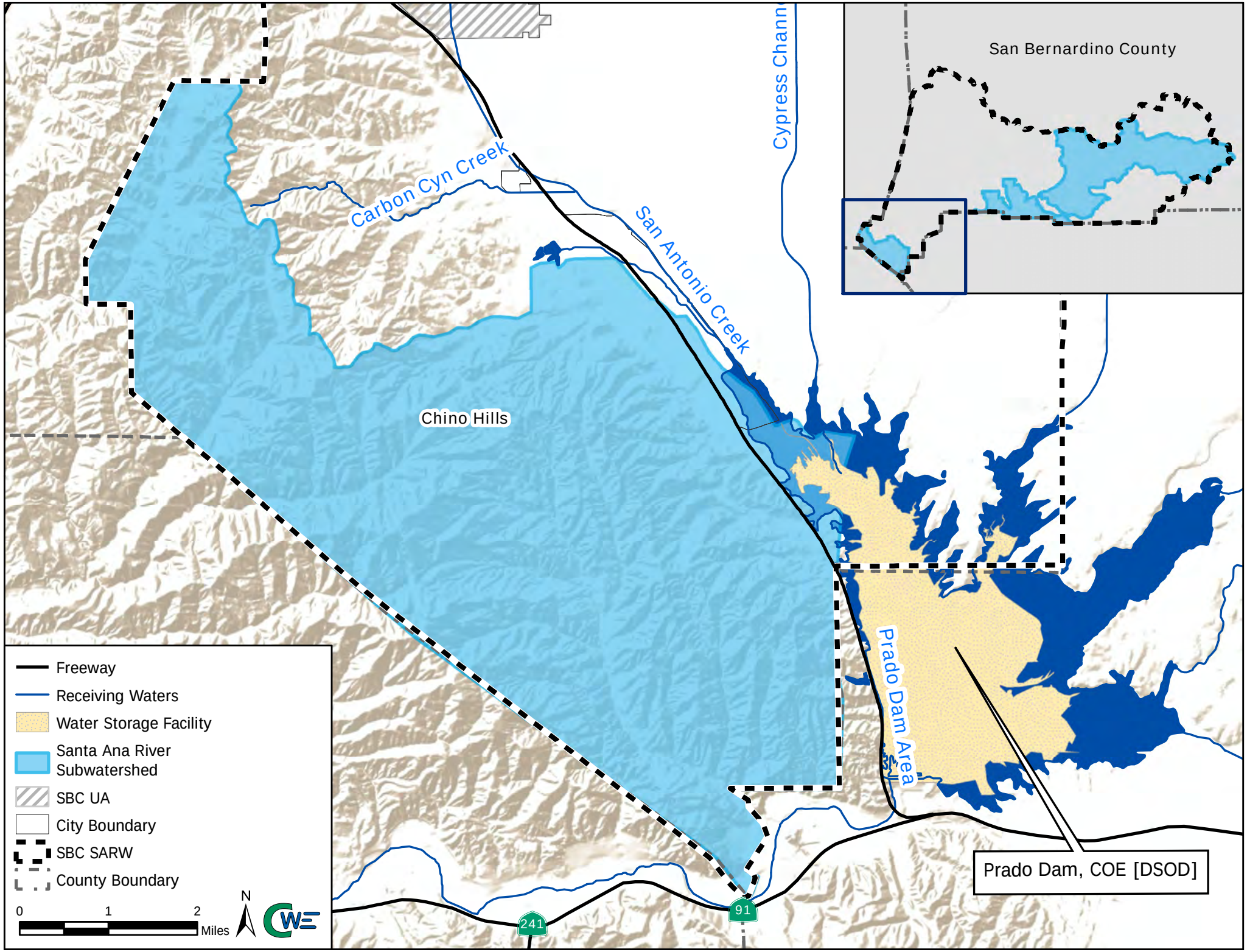

San Bernardino County
Lytle Creek
Etiwanda Creek Channel
San Sevaine Channel
Deer Creek
Day Creek
Rancho Cucamonga
Upland
Rialto
Rialto Channel
Fontana
Colton
Grand Terrace
210
15
30
10
Freeway
Receiving Waters
San Sevaine Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1
2
Miles
N

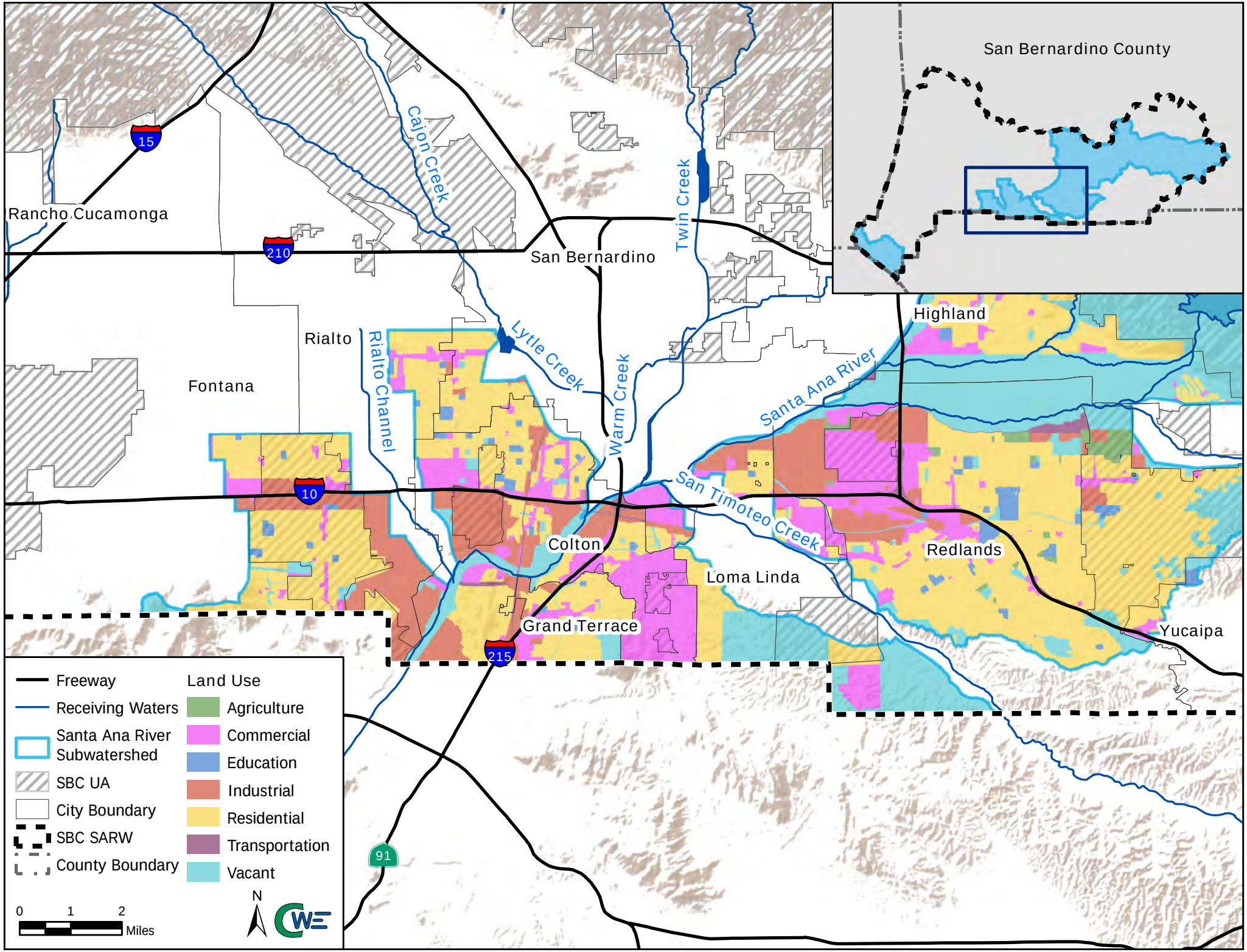

San Bernardino County
Rich Basin
Lytle Creek
Etiwanda Debris Basin (Etiwanda Creek Dam)
Etiwanda Creek Channel
San Sevaine Channel
Victoria Basin
San Sevaine Basins
Deer Creek
Day Creek
210
15
Rancho Cucamonga
Upland
Hickory Basin (DSOD)
30
Cucamonga
Rialto
Rialto Cha
Banana Basin
Etiwanda Conservation Basins
Etiwanda Creek Channel
10
Fontana
Jurupa Basin (DSOD)
Colton
Freeway
Receiving Waters
Water Storage Facility
San Sevaine Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

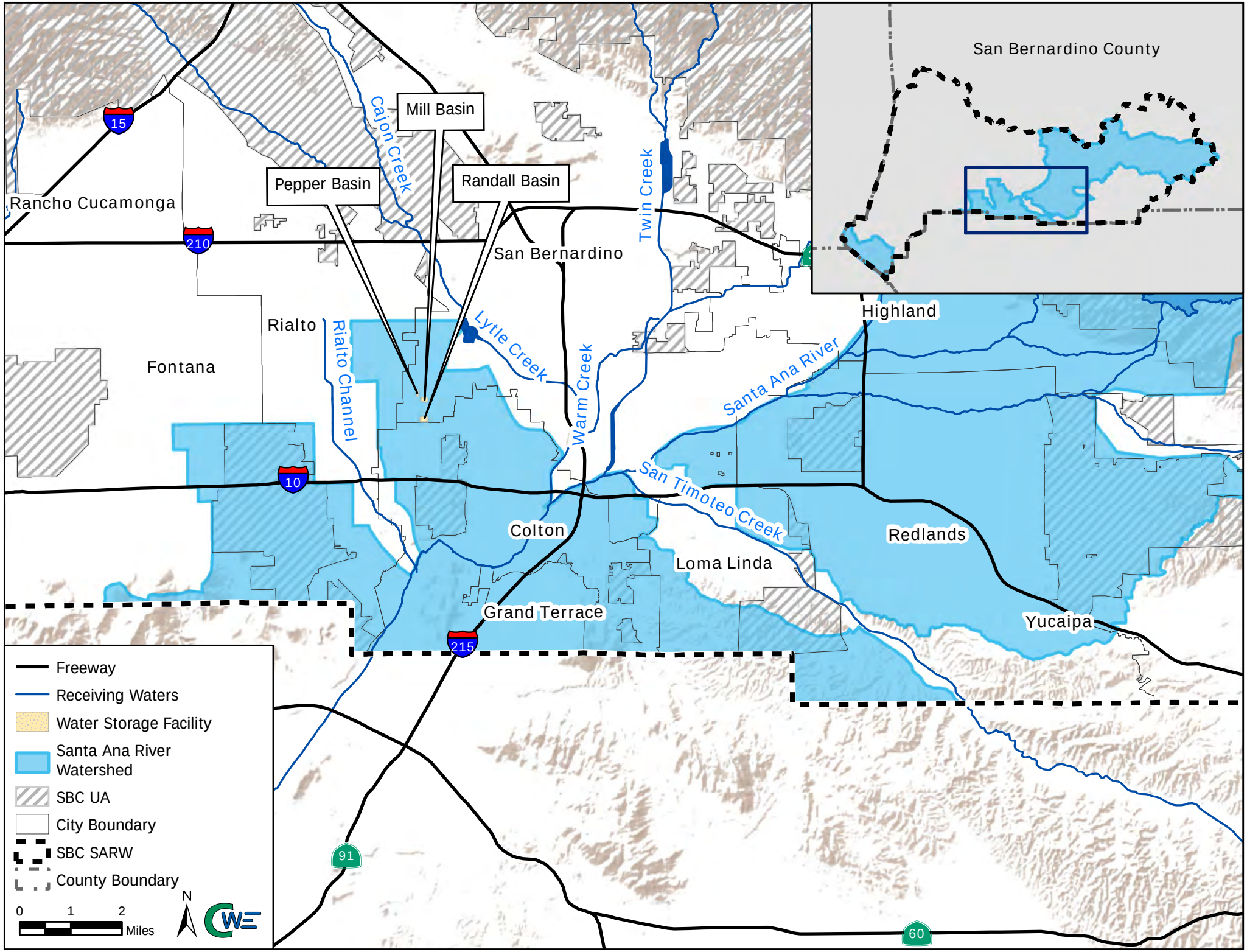

San Bernardino County
Twin Creek
San Bernardino
Plunge
30
Warm Creek
City Creek
Highland
Seven Oaks Dam
Santa Ana River
Mill Creek
Redlands
215
San Timoteo Creek
Loma Linda
Colton
Yucaipa
10
Little San Gorgonio Creek
60
Freeway
Receiving Waters
San Timoteo Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1
2
Miles
N

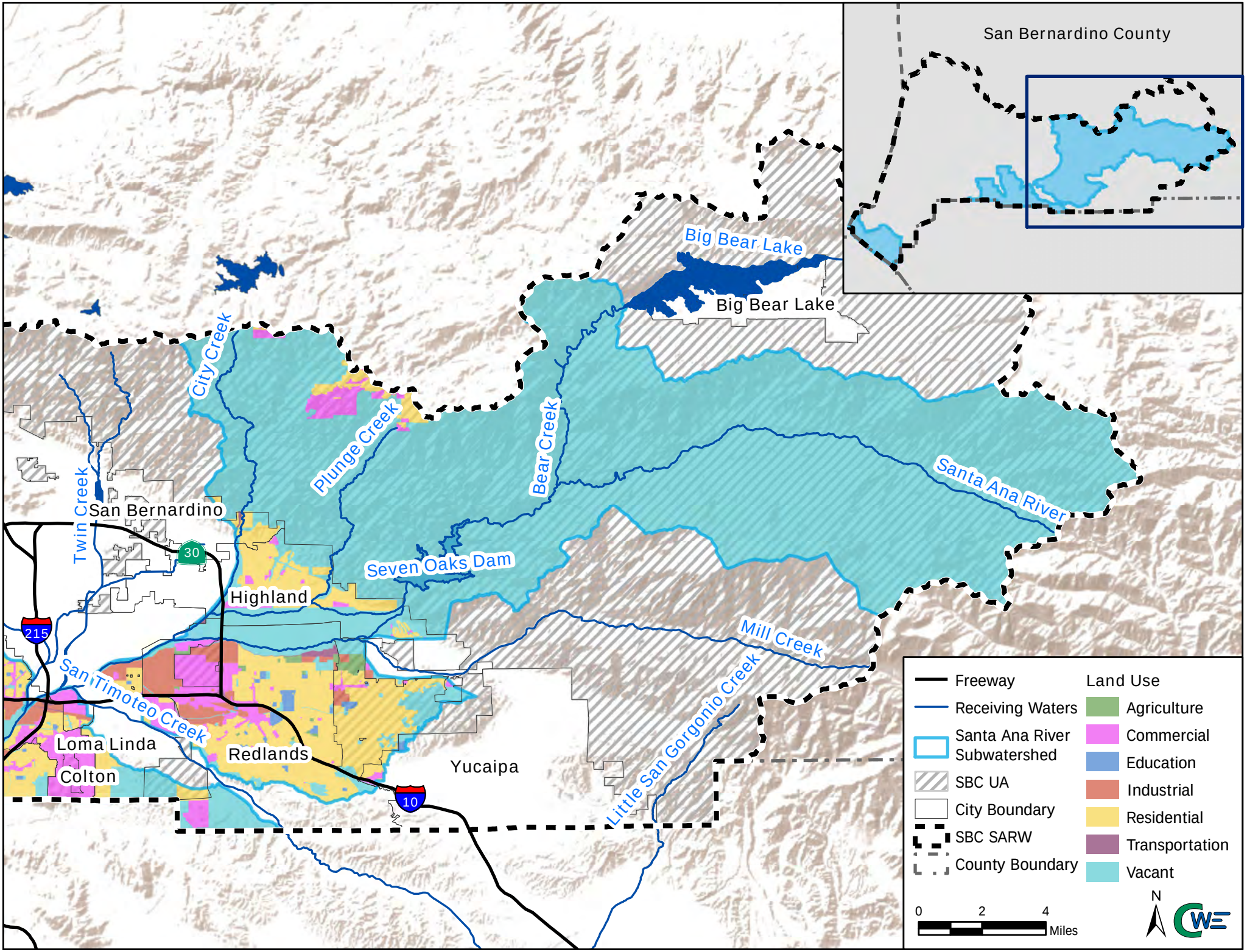

San Bernardino County
Wilson Creek Spreading Grounds (Wilson Basins)
San Timoteo Sediment Basins
Potato Creek Spreading Grounds
Oak Glen Basin/Wilson II (WC-II)
Wilson Creek Basins
Dunlap Basin (D-5)
13th Street Basin
Dunlap Basins
Dunlap Basin (D-1)
Chicken Springs Basin
Wildwood Creek Basins
Yucaipa Creek Basin (Y-3)
Scott Canyon Basin
Mountain View Basin
Yucaipa Creek Basins
Wildwood Creek Basin (WW-1)
Lee Hill Canyon Basin
Loma Linda Basins
Twin Creek
San Bernardino
Warm Creek
City Creek
Highland
Seven Oaks Dam
Santa Ana River
Mill Creek
Redlands
San Timoteo Creek
Loma Linda
Colton
Yucaipa
Little San Gorgonio Creek
30
215
10
Freeway
Receiving Waters
Water Storage Facility
San Timoteo Creek Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

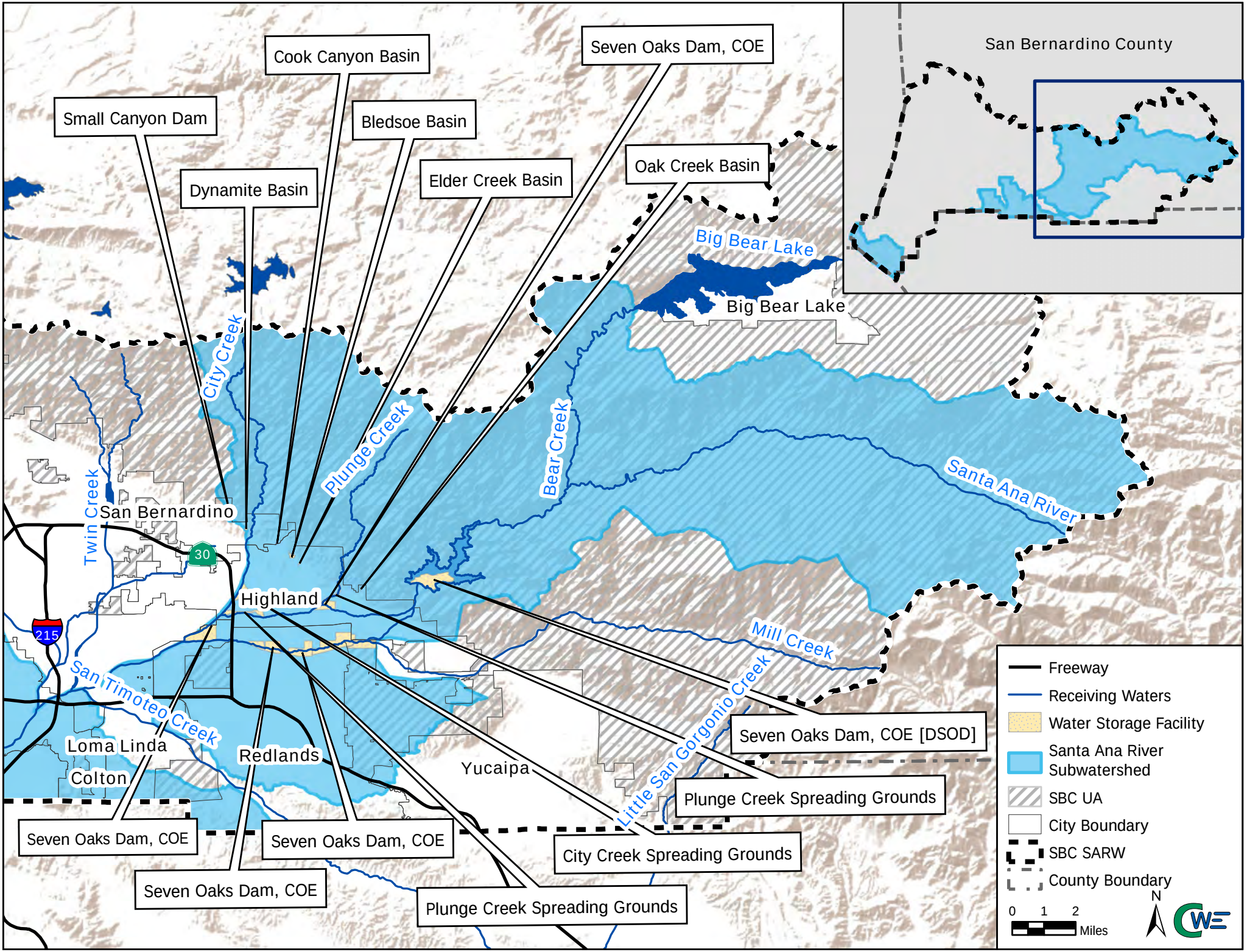

San Bernardino County
Carbon Cyn Creek
Chino
San Antonio Creek
Cypress Channel
Prado Dam Area
Chino Hills
Freeway
Receiving Waters
Santa Ana River Watershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1
2
Miles
N
241
91

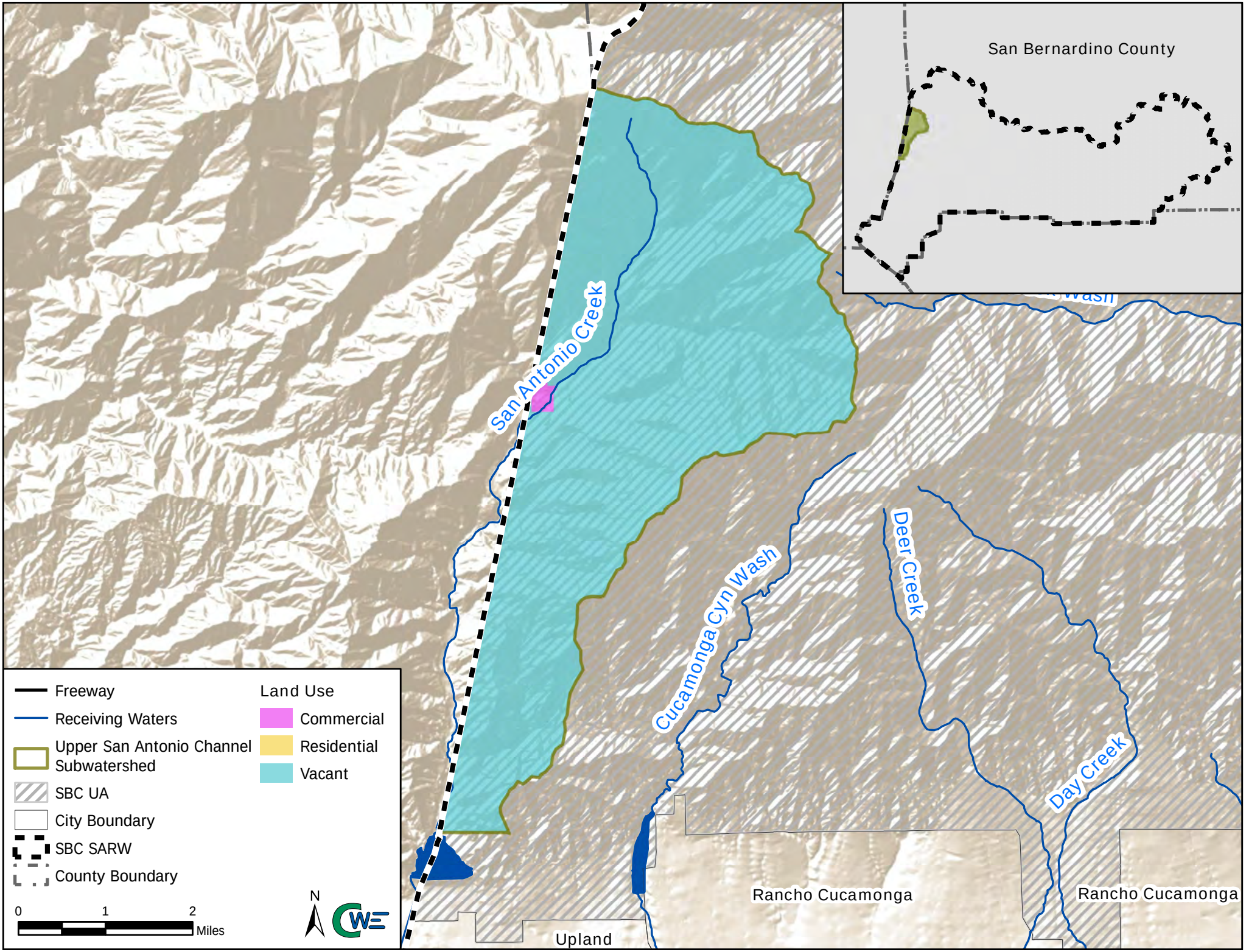

San Bernardino County
Carbon Cyn Creek
San Antonio Creek
Cypress Chann
Chino Hills
Prado Dam Area
Prado Dam, COE [DSOD]
91
241
Freeway
Receiving Waters
Water Storage Facility
Santa Ana River Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

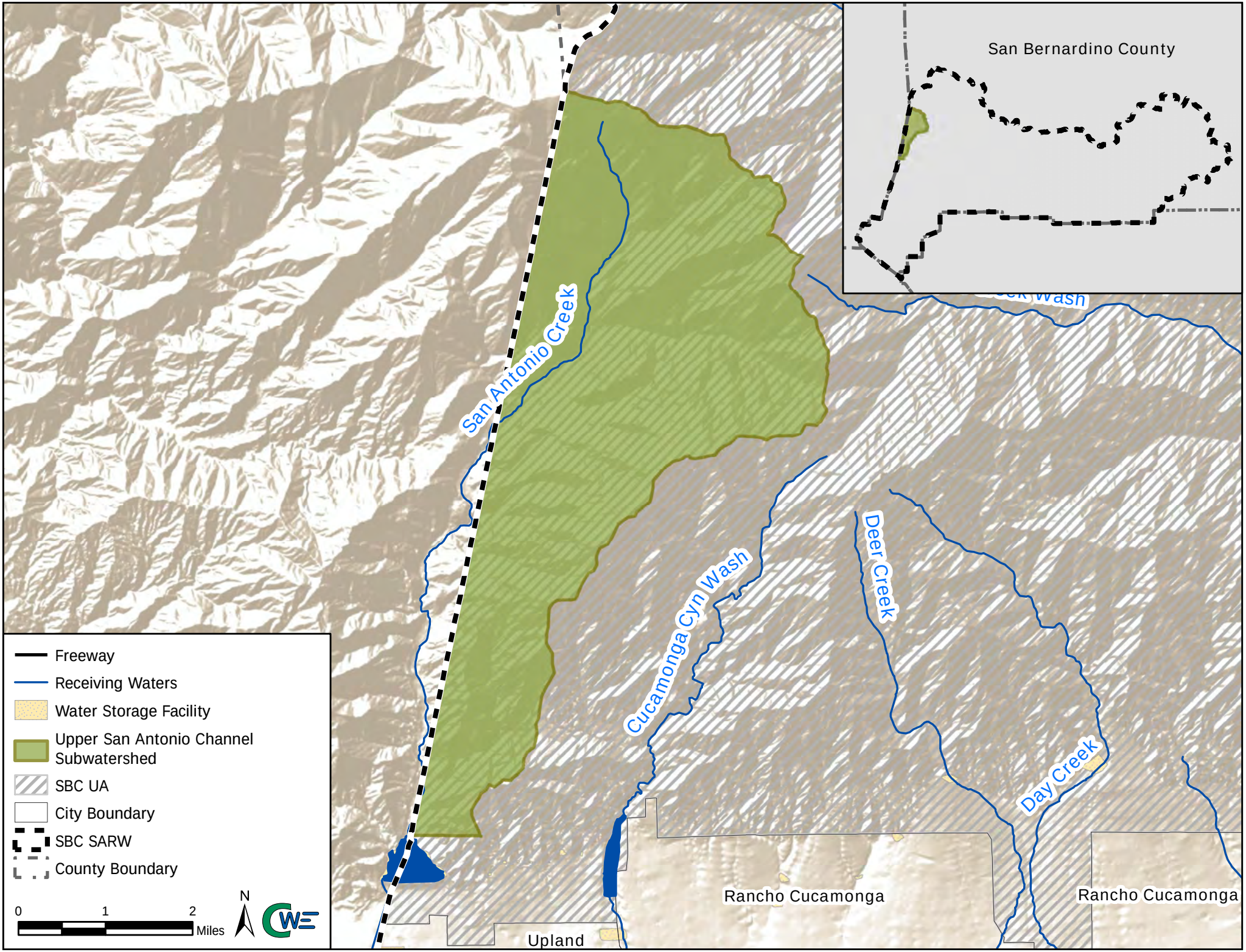

San Bernardino County
Rancho Cucamonga
San Bernardino
Rialto
Fontana
Highland
Colton
Loma Linda
Redlands
Yucaipa
Grand Terrace
Cajon Creek
Twin Creek
Lytle Creek
Rialto Channel
Warm Creek
Santa Ana River
San Timoteo Creek
15
210
10
215
91
Freeway
Receiving Waters
Santa Ana River Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0 1 2
Miles
N

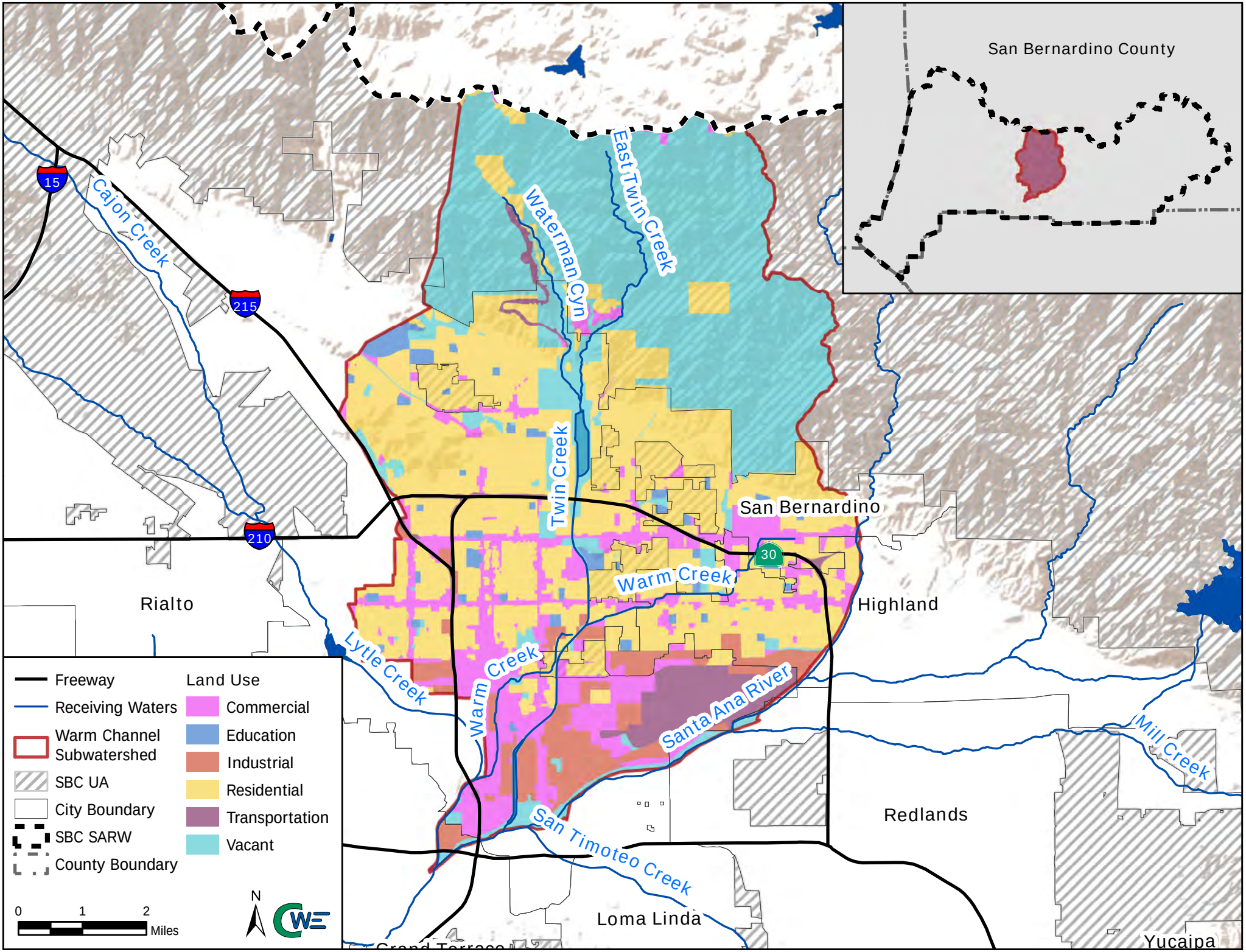

San Bernardino County
Mill Basin
Pepper Basin
Randall Basin
Cajon Creek
Twin Creek
Rancho Cucamonga
San Bernardino
Highland
Rialto
Rialto Channel
Lytle Creek
Warm Creek
Santa Ana River
Fontana
San Timoteo Creek
Colton
Redlands
Loma Linda
Grand Terrace
Yucaipa
15
210
10
215
91
60
Freeway
Receiving Waters
Water Storage Facility
Santa Ana River Watershed
SBC UA
City Boundary
SBC SARW
County Boundary
0 1 2
Miles
N

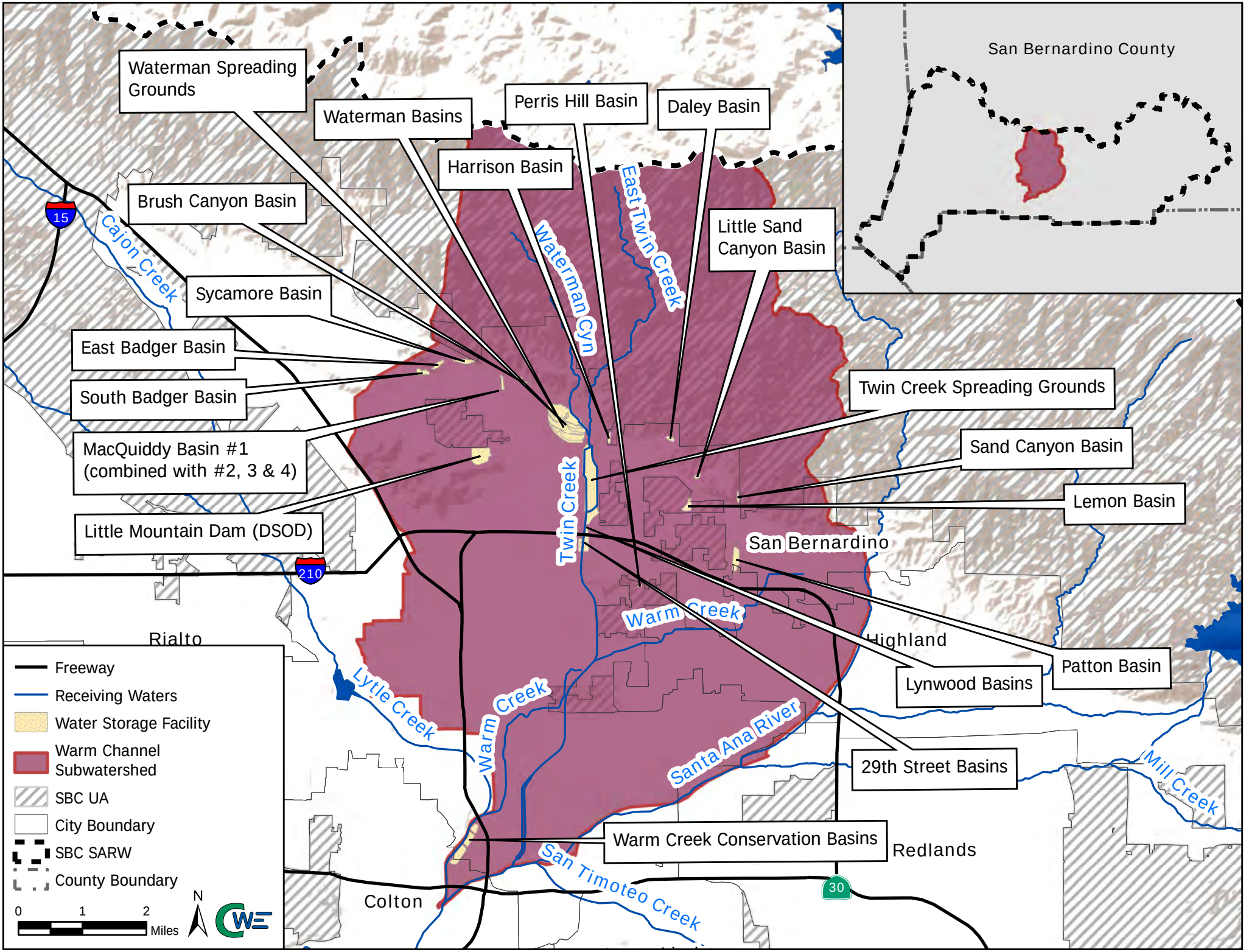

San Bernardino County
Big Bear Lake
Big Bear Lake
City Creek
Plunge Creek
Bear Creek
Santa Ana River
Twin Creek
San Bernardino
30
Seven Oaks Dam
Highland
215
Mill Creek
San Timoteo Creek
Loma Linda
Colton
Redlands
Yucaipa
Little San Gorgonio Creek
10
Freeway
Receiving Waters
Santa Ana River Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
2
4
Miles
N


San Bernardino County
Cook Canyon Basin
Seven Oaks Dam, COE
Small Canyon Dam
Bledsoe Basin
Dynamite Basin
Elder Creek Basin
Oak Creek Basin
Big Bear Lake
Big Bear Lake
City Creek
Plunge Creek
Bear Creek
Santa Ana River
Twin Creek
San Bernardino
30
Highland
215
Mill Creek
San Timoteo Creek
Loma Linda
Colton
Redlands
Yucaipa
Little San Gorgonio Creek
Seven Oaks Dam, COE [DSOD]
Plunge Creek Spreading Grounds
Seven Oaks Dam, COE
Seven Oaks Dam, COE
City Creek Spreading Grounds
Seven Oaks Dam, COE
Plunge Creek Spreading Grounds
Freeway
Receiving Waters
Water Storage Facility
Santa Ana River Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0 1 2
Miles
N


San Bernardino County
San Antonio Creek
Cucamonga Cyn Wash
Deer Creek
Day Creek
Rancho Cucamonga
Rancho Cucamonga
Upland
Freeway
Receiving Waters
Upper San Antonio Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Residential
Vacant
0
1
2
Miles
N


San Bernardino County
San Antonio Creek
Cucamonga Cyn Wash
Deer Creek
Day Creek
Rancho Cucamonga
Rancho Cucamonga
Upland
Freeway
Receiving Waters
Water Storage Facility
Upper San Antonio Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N


San Bernardino County
15
215
210
30
Cajon Creek
Waterman Cyn
East Twin Creek
Twin Creek
Warm Creek
Warm Creek
Lytle Creek
Santa Ana River
Mill Creek
San Timoteo Creek
San Bernardino
Rialto
Highland
Redlands
Loma Linda
Yucaipa
Freeway
Receiving Waters
Warm Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1
2
Miles
N


Waterman Spreading Grounds
Waterman Basins
Perris Hill Basin
Daley Basin
Harrison Basin
Brush Canyon Basin
Little Sand Canyon Basin
Sycamore Basin
East Badger Basin
South Badger Basin
MacQuiddy Basin #1 (combined with #2, 3 & 4)
Little Mountain Dam (DSOD)
Twin Creek Spreading Grounds
Sand Canyon Basin
Lemon Basin
Patton Basin
Lynwood Basins
29th Street Basins
Warm Creek Conservation Basins
Cajon Creek
Waterman Cyn
East Twin Creek
Twin Creek
Warm Creek
Lytle Creek
Santa Ana River
San Timoteo Creek
Mill Creek
San Bernardino
Rialto
Highland
Redlands
Colton
15
210
30
San Bernardino County
Freeway
Receiving Waters
Water Storage Facility
Warm Channel Subwatershed
SBC UA
City Boundary
SBC SARW
County Boundary
0
1
2
Miles
N

Attachment D

Water Quality Data Analysis

Summary of Dry-Weather Water Quality Data Analysis

Constituent	Data Range	Number of Exceedances / Number of Samples																	
		Cucamonga Creek	Cucamonga Channel	SAR @ Pedley Reach 3	SAR @ Mt Vernon Crossing Reach 4	Deer Creek	Lower Deer Creek	Warm Creek Bypass	Rialto Channel	East Rialto Channel	San Bernardino Channel	Warm Creek Channel	Del Rosa Channel	Lytle Cajon Channel	Live Oak Canyon Creek	San Timoteo Creek	Mission Creek Channel	Zanja Creek	SAR @ Mountain View Reach 5
Field (In-Situ) Measurements																			
pH	All	5/6 H	2/4 H	0/5	--	1/2 H	2/2 H	--	--	--	--	--	--	--	--	1/1 H	--	--	--
	5-yrs	5/6 H	2/3 H	0/5	--	1/2 H	2/2 H	--	--	--	--	--	--	--	--	1/1 H	--	--	--
Cations																			
Total Hardness	All	0/10	0/8	0/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	1/1	--	--	--
	5-yrs	0/10	0/3	0/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	1/1	--	--	--
Sodium	All	0/10	0/8	7/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	1/1	--	--	--
	5-yrs	0/10	0/3	7/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	1/1	--	--	--
Anions																			
Chloride	All	0/10	0/8	1/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	1/1	--	--	--
	5-yrs	0/10	0/3	1/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	1/1	--	--	--
Sulfate	All	0/10	0/8	0/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	0/1	--	--	--
	5-yrs	0/10	0/3	0/9	--	0/4	0/4	--	--	2/2	--	--	--	--	--	0/1	--	--	--
Solids																			
TDS	All	--	0/8	0/9	0/2	--	--	0/3	--	1/2	0/3	0/3	--	--	--	1/1	--	--	--
	5-yrs	--	0/3	0/9	0/2	--	--	0/3	--	1/2	0/3	0/3	--	--	--	1/1	--	--	--
Aggregate Organic Compounds																			
COD	All	--	5/8	0/9	2/2	--	--	0/3	--	2/2	3/3	1/3	--	--	--	1/1	--	--	--
	5-yrs	--	2/3	0/9	2/2	--	--	0/3	--	2/2	3/3	1/3	--	--	--	1/1	--	--	--
General Inorganics																			
Cyanide	All	1/10	0/8	0/9	0/2	0/4	0/4	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
	5-yrs	1/10	0/3	0/9	0/2	0/4	0/4	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
Nutrients																			
Total Inorganic Nitrogen, calc	All	0/10	0/8	0/9	0/2	--	--	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
	5-yrs	0/10	0/3	0/9	0/2	--	--	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
Metals and Metalloids (Total)																			
Chromium 6+	All	0/5	0/3	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
	5-yrs	0/5	0/2	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
Mercury	All	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5-yrs	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	All	0/5	0/3	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
	5-yrs	0/5	0/2	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
Metals and Metalloids (Dissolved)																			
Arsenic (CTR, 1-hr Avg, WWE)	All	0/5	0/3	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
	5-yrs	0/5	0/2	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
Cadmium	All	1/5	0/3	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
	5-yrs	1/5	0/2	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--

Constituent	Data Range	Number of Exceedances / Number of Samples																	
		Cucamonga Creek	Cucamonga Channel	SAR @ Pedley Reach 3	SAR @ Mt Vernon Crossing Reach 4	Deer Creek	Lower Deer Creek	Warm Creek Bypass	Rialto Channel	East Rialto Channel	San Bernardino Channel	Warm Creek Channel	Del Rosa Channel	Lytle Cajon Channel	Live Oak Canyon Creek	San Timoteo Creek	Mission Creek Channel	Zanja Creek	SAR @ Mountain View Reach 5
Copper	All	4/10	0/8	0/9	0/2	2/4	0/4	0/3	--	0/2	0/3	1/3	--	--	--	0/1	--	--	--
	5-yrs	4/10	0/3	0/9	0/2	2/4	0/4	0/3	--	0/2	0/3	1/3	--	--	--	0/1	--	--	--
Lead	All	1/10	0/8	0/9	0/2	0/4	0/4	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
	5-yrs	1/10	0/3	0/9	0/2	0/4	0/4	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
Nickel	All	0/5	0/3	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
	5-yrs	0/5	0/2	0/4	0/1	0/2	0/2	0/1	--	0/0	0/1	0/1	--	--	--	0/1	--	--	--
Silver	All	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5-yrs	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	All	0/10	0/8	0/9	0/2	0/4	0/4	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
	5-yrs	0/10	0/3	0/9	0/2	0/4	0/4	0/3	--	0/2	0/3	0/3	--	--	--	0/1	--	--	--
Organochlorine Pesticides and PCBs[1]																			
VOCs[1]																			
Semivolatile Organic Compounds[1]																			
Organo-Phosphorus Pesticides[1]																			
Bacteria																			
E. coli	All	2/3	4/8	9/9	0/2	1/4	2/4	1/3	--	1/2	1/3	0/3	--	--	--	1/1	--	--	--
	5-yrs	2/3	2/3	9/9	0/2	1/4	2/4	1/3	--	1/2	1/3	0/3	--	--	--	1/1	--	--	--
Fecal Coliform	All	1/3	3/5	6/6	1/2	1/4	3/4	1/1	--	0/0	0/1	0/1	--	--	--	1/1	--	--	--
	5-yrs	1/3	2/3	6/6	1/2	1/4	3/4	1/1	--	0/0	0/1	0/1	--	--	--	1/1	--	--	--

[1] No target analytes detected above detection limit.

Summary of Wet-Weather Water Quality Data Analysis

Constituent	Data Range	Number of Exceedances / Number of Samples												
		Cucamonga Creek	Cucamonga Channel	SAR @ Pedley Reach 3	SAR @ Mt Vernon Crossing Reach 4	Deer Creek	Lower Deer Creek	Warm Creek Bypass	Rialto Channel	East Rialto Channel	San Bernardino Channel	Warm Creek Channel	Del Rosa Channel	Lytle Cajon Channel
Field (In-Situ) Measurements														
pH	All	1/12 L, 1/12 H	2/18 H	1/26 L	2/11 H	1/6 L	2/5 H	--	--	--	--	--	--	--
	5-yrs	1/4 L	0/4	1/13 L	2/11 H	1/6 L	2/5 H	--	--	--	--	--	--	--
Cations														
Total Hardness	All	0/49	1/21	4/40	--	0/7	0/6	--	--	0/2	--	--	0/2	--
	5-yrs	0/22	0/4	1/16	--	0/7	0/6	--	--	0/2	--	--	0/2	--
Sodium	All	0/49	0/20	0/39	--	0/7	0/6	--	--	0/2	--	--	0/2	--
	5-yrs	0/22	0/4	0/15	--	0/7	0/6	--	--	0/2	--	--	0/2	--
Anions														
Chloride	All	0/49	0/21	0/40	0/0	0/7	0/6	--	--	0/2	--	--	0/2	--
	5-yrs	0/22	0/4	0/16	0/0	0/7	0/6	--	--	0/2	--	--	0/2	--
Sulfate	All	0/49	0/21	0/40	--	0/7	0/6	--	--	0/2	--	--	0/2	--
	5-yrs	0/22	0/4	0/16	--	0/7	0/6	--	--	0/2	--	--	0/2	--
Solids														
TDS	All	--	0/21	0/40	0/12	--	--	0/2	0/2	0/2	0/2	0/2	0/2	--
	5-yrs	--	0/4	0/16	0/12	--	--	0/2	0/2	0/2	0/2	0/2	0/2	--
Aggregate Organic Compounds														
COD	All	--	18/21	33/40	10/12	--	--	2/2	2/2	2/2	2/2	2/2	2/2	--
	5-yrs	--	4/4	13/16	10/12	--	--	2/2	2/2	2/2	2/2	2/2	2/2	--
General Inorganics														
Cyanide	All	0/10	0/10	0/9	0/10	0/5	0/4	0/2	0/2	0/2	0/2	0/2	0/2	--
	5-yrs	0/10	0/2	0/9	0/10	0/5	0/4	0/2	0/2	0/2	0/2	0/2	0/2	--
Nutrients														
Total Inorganic Nitrogen, calc	All	0/49	0/21	0/40	0/12	0/7	0/6	0/2	0/2	0/2	0/2	0/2	0/2	--
	5-yrs	0/22	0/4	0/16	0/12	0/7	0/6	0/2	0/2	0/2	0/2	0/2	0/2	--
Metals and Metalloids (Total)														
Chromium 6+	All	0/6	0/5	0/4	0/5	0/3	0/2	0/1	0/1	0/1	0/1	0/1	0/1	--
	5-yrs	0/6	0/2	0/4	0/5	0/3	0/2	0/1	0/1	0/1	0/1	0/1	0/1	--
Mercury	All	--	--	--	--	--	--	--	--	--	--	--	--	--
	5-yrs	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	All	0/37	0/14	1/32	0/5	0/3	0/2	0/1	0/1	0/1	0/1	0/1	0/1	--
	5-yrs	0/12	0/2	0/9	0/5	0/3	0/2	0/1	0/1	0/1	0/1	0/1	0/1	--
Metals and Metalloids (Dissolved)														
Arsenic (CTR, 1-hr Avg, WWE)	All	0/23	0/16	0/17	0/7	0/5	0/4	0/1	0/1	0/1	0/1	0/1	0/1	--
	5-yrs	0/18	0/4	0/11	0/7	0/5	0/4	0/1	0/1	0/1	0/1	0/1	0/1	--
Cadmium	All	6/22	3/16	0/17	0/7	0/5	0/4	0/1	0/1	0/1	0/1	0/1	0/1	--
	5-yrs	2/17	0/4	0/11	0/7	0/5	0/4	0/1	0/1	0/1	0/1	0/1	0/1	--

Constituent	Data Range	Number of Exceedances / Number of Samples												
		Cucamonga Creek	Cucamonga Channel	SAR @ Pedley Reach 3	SAR @ Mt Vernon Crossing Reach 4	Deer Creek	Lower Deer Creek	Warm Creek Bypass	Rialto Channel	East Rialto Channel	San Bernardino Channel	Warm Creek Channel	Del Rosa Channel	Lytle Cajon Channel
Copper	All	16/26	6/21	0/22	0/12	3/7	4/6	2/2	1/2	2/2	0/2	1/2	1/2	--
	5-yrs	12/21	0/4	0/16	0/12	3/7	4/6	2/2	1/2	2/2	0/2	1/2	1/2	--
Lead	All	0/26	0/21	0/22	0/12	0/7	0/6	0/2	0/2	0/2	0/2	0/2	0/2	--
	5-yrs	0/21	0/4	0/16	0/12	0/7	0/6	0/2	0/2	0/2	0/2	0/2	0/2	--
Nickel	All	0/6	0/5	0/4	0/5	0/3	0/2	0/1	0/1	0/1	0/1	0/1	0/1	--
	5-yrs	0/6	0/2	0/4	0/5	0/3	0/2	0/1	0/1	0/1	0/1	0/1	0/1	--
Silver	All	12/16	6/14	0/15	0/5	2/4	6/6	0/1	0/0	0/1	0/1	0/1	0/0	--
	5-yrs	7/11	0/2	0/9	0/5	2/4	6/6	0/1	0/0	0/1	0/1	0/1	0/0	--
Zinc	All	13/26	9/21	1/22	3/12	4/6	5/6	2/2	2/2	2/2	1/2	2/2	2/2	--
	5-yrs	12/21	0/4	1/16	3/12	4/6	5/6	2/2	2/2	2/2	1/2	2/2	2/2	--
Organochlorine Pesticides and PCBs[1]														
VOCs[1]														
Semivolatile Organic Compounds[1]														
Organo-Phosphorus Pesticides[1]														
Bacteria														
E. coli	All	37/37	15/15	39/39	11/11	7/7	6/7	2/2	2/2	2/2	1/1	2/2	2/2	--
	5-yrs	15/15	4/4	16/16	11/11	7/7	6/7	2/2	2/2	2/2	1/1	2/2	2/2	--
Fecal Coliform	All	32/36	12/12	35/35	8/8	4/4	3/4	2/2	2/2	2/2	1/1	2/2	2/2	--
	5-yrs	13/13	4/4	13/13	8/8	4/4	3/4	2/2	2/2	2/2	1/1	2/2	2/2	--

[1] No target analytes detected above detection limit.

Attachment E

Stakeholder and Public Outreach, Education, and Engagement Plan

SAN BERNARDINO COUNTY

STAKEHOLDER AND PUBLIC OUTREACH, EDUCATION, AND ENGAGEMENT PLAN

FOR THE SBC SARW SWRP

1561 E. Orangethorpe Avenue, Suite 240
Fullerton, California 92831
(714) 526-7500
www.cwecorp.com

Stakeholder and Public Outreach, Education, and Engagement Plan

for the SBC SARW SWRP

Prepared for:

San Bernardino County
825 E. Third Street
San Bernardino, California 92415
TEL (909) 387-8109
FAX (909) 387-7911

Prepared by:

1561 E. Orangethorpe Avenue, Suite 240
Fullerton, California, 92831

TEL (714) 526-7500 | FAX (714) 526-7004 | www.cwecorp.com

July 2017

Table of Contents

List of Figures

List of Tables

Acronyms

BBMWD	Big Bear Municipal Water District
DAC	Disadvantaged Community
District or SBCFCD	San Bernardino County Flood Control District
DWR	Department of Water Resources
IEUA	Inland Empire Utilities Agency
MHI	Median Household Income
NPDES	National Pollutant Discharge Elimination System
RCFCWCD	Riverside County Flood Control and Water Conservation District
RWQCB	Regional Water Quality Control Board (Santa Ana)
SAWPA	Santa Ana Watershed Project Authority
SB	Senate Bill
SBC SARW	San Bernardino County Santa Ana River Watershed
SBVMWD	San Bernardino Valley Municipal Water District
SPOEEP	Stakeholder and Public Outreach, Education, and Engagement Plan
SWRCB	State Water Resources Control Board
SWRP	Stormwater Resource Plan
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
WMWD	Western Municipal Water District

1. Introduction

California voters passed the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) during the general election of November 4, 2014. As a precursor to the passage of Proposition 1, the California Legislature adopted Senate Bill (SB) 985 entitled the Stormwater Resource Planning Act (SB 985), requiring the development of a Stormwater Resource Plan (SWRP) to be eligible to receive grants from a bond act approved after January 1, 2014, for stormwater and dry-weather runoff capture projects. A SWRP is a stormwater management document developed on a watershed basis that identifies a prioritized list of projects to address stormwater and dry-weather runoff, while also providing multiple benefits, such as water supply, flood management, and environmental and community enhancements. The State Water Resources Control Board (SWRCB) developed Stormwater Resource Plan Guidelines (2015) to help facilitate the proper preparation of SWRPs or equivalent documents. Proposition 1 includes numerous categories of projects to be funded, one being the Stormwater Grant Program. Planning and implementation grants were included in the Stormwater Grant Program. Planning grants are to be used for developing SWRPs and/or conducting studies prior to project implementation while the implementation grants are used to fund projects identified in a SWRP or equivalent document.

The San Bernardino County Flood Control District (SBCFCD or District) was awarded planning grant funds through the Stormwater Grant Program for the development of the San Bernardino County Santa Ana River Watershed (SBC SARW) SWRP (Grant Agreement No. D1612627). The SBC SARW SWRP encompasses the upper limits of the SARW that lies within the San Bernardino County jurisdictional boundary.

This Stakeholder and Public Outreach, Education, and Engagement Plan (SPOEEP) has been developed to support the outreach efforts that will be conducted throughout the SWRP development, consistent with the SWRP Guidelines (2015), applicable Water Code (Sections 10561-10573), and the Proposition 1 Grant Agreement. The Grant Agreement identifies the following tasks (Task 5) associated with stakeholder and public outreach, education, and participation:

- Provide a stakeholder outreach, education, and engagement plan and submit to the Grant Manager for review and approval.
- Conduct a minimum of two (2) stakeholder meetings and one (1) public outreach meeting for interested stakeholders over the course of the SWRP development. At a minimum, one outreach meeting shall include a request for stakeholders to propose multi-benefit stormwater management projects.
- Submit a summary of stakeholder outreach, education and public participation and collaboration activities including meeting agenda(s) and materials, meeting summaries, sign-in sheets, and photos in the associated quarterly progress report(s).

The Grant Agreement also discusses the development of a Technical Advisory Committee (TAC) which involves stakeholders (Task 2). The SPOEEP summarizes efforts associated with the TAC, as they relate to stakeholder outreach, while the tasks identified in the bulleted list above are the main focus.

1.1 SPOEEP Goals

The SPOEEP provides the scope of work for the stakeholder and public outreach and education that will be implemented throughout the SWRP development. The SPOEEP identifies how input, ideas, and information will be solicited and collected from stakeholders and the public focusing on multi-benefit projects that provide water quality, water supply, flood management, environmental, and community benefits. The SPOEEP also describes the efforts that will be made during the SWRP development to educate stakeholders and the public. The information collected through SPOEEP implementation will be considered, and incorporated as applicable, throughout the SWRP development.

A key goal of the SPOEEP is to outline the steps that will be taken to involve interested stakeholders and the public in the development and review of the SWRP. These efforts include reaching out to a broad range of stakeholders, including elected and appointed officials, municipal and county staff, watershed groups, local water agencies, and non-governmental organizations, along with the public (e.g., residents, businesses, homeowners associations, etc.). Each of these audiences has a slightly different point of view and motivation for participating in the SBC SARW SWRP development. Understanding the different points of view will allow the SWRP to be prepared in a way that benefits the community and encourages support during SWRP development and implementation.

It is important to understand the roles the stakeholders will play versus how the public will be involved. **Section 2** defines the different groups involved in these efforts and the sections of the SPOEEP clarify how the District will interact with the public versus the stakeholders. Additional outreach efforts are required with stakeholders, as they will provide technical information to support the SWRP development. The public will be involved in the SWRP in a different capacity, which is further detailed herein. The District will use the development of the SWRP as an educational opportunity for both the stakeholders and the public. Information regarding the goals, projects, programs, and needs identified in the SWRP will be shared and the public (including stakeholders) will be given an opportunity to provide feedback on the plan itself, while not being as involved in the technical aspects. Goals associated with each specific type of outreach/education effort are detailed within their appropriate sections.

1.2 SPOEEP Structure

The development of the SBC SARW SWRP provides an opportunity to collect regional data, promote discussion between agencies, and creates a platform for transparency concerning both the SWRP and future project/program implementation. The SPOEEP structure is as follows:

- **Section 2 – Definitions**: defines key terms such as “public,” “stakeholders,” and “TAC” to clarify how outreach, education, and engagement will be tailored to each group.
- **Section 3 – Stakeholder Involvement in TAC**: summarizes goals and strategies related with the stakeholder involvement in the TAC, which is separate from general stakeholder outreach, education, and engagement efforts.
- **Section 4 – Stakeholder Outreach**: describes who, what, when, why, and how relating to the two (2) stakeholder outreach events that will be conducted during SWRP development.
- **Section 5 – Public Outreach**: describes who, what, when, why, and how relating to the one (1) public outreach event that will be held during the SWRP development.

- **Section 6 – Education**: details the efforts that will be made in educating stakeholders and the public, such as print material, webpage, and social media.
- **Section 7 – Alignment with SWRP Guidelines**: summarizes how the stakeholder and public outreach, education, and engagement efforts meet the SWRP Guidelines and corresponding sections of the Water Code.

2. Definitions

This section defines key terms that will be used throughout the SPOEEP. The terms defined below have similar definitions and understanding the differences will provide clarity regarding the outreach and education efforts that will be made during the SBC SARW SWRP development.

Public: Ordinary people in general; the community. Examples include residents, businesses, homeowners associations, etc.

Stakeholders: A person, group, or organization that has interest or concern in an organization and/or project (such as the SBC SARW SWRP). Stakeholders can affect or be affected by the organization's and/or project's actions, objectives, and policies. Examples include, and are not limited to, elected and appointed officials, municipal and county staff, watershed groups, local water agencies, and non-governmental organizations.

TAC Stakeholders: Key stakeholders (see definition above) that have service areas that overlaps (at least in part) with the SBC SARW. These stakeholders work closely with the District and partnerships have been/are in place for projects/programs that have been and continue to be implemented.

3. Stakeholder Involvement in TAC

The SBC SARW SWRP TAC was formed to solicit expert advice and technical support throughout the SWRP development. In addition to the requirements identified in the Grant Agreement for stakeholder and public outreach (refer to **Section 1**), the Grant Agreement requires that the District:

1. Establish a TAC for the SWRP development that includes the SWRCB, Regional Water Quality Control Board (RWQCB), and other interested parties, such as municipalities, water suppliers, local agencies, non-governmental organizations, public utilities, and regulatory agencies. A list of TAC members, their roles and responsibilities, and affiliations must be submitted to the Grant Manager.
2. Convene a kickoff meeting to develop the SWRP water management goals and objectives, formalize roles, and develop a schedule for future meetings. A summary of SWRP objectives, meeting schedule, and updates to the TAC participant list must be submitted to the Grant Manager.
3. Conduct a minimum of three (3) additional meetings and submit the agendas, meeting notes, sign-in sheets, and a list of current action items for each meeting to the Grant Manager.

Information pertaining to the TAC is presented in this SPOEEP to clarify how the effort being made to involve stakeholders in the TAC is separate from other stakeholder outreach efforts (detailed in **Section 4**). TAC member roles and responsibilities and the TAC schedule are presented in subsections below. Additional information required based on the Grant Agreement is submitted separately to the Grant Manager.

3.1 Roles and Responsibilities

Key stakeholders were invited to serve on the TAC based on proximity to the SBC SARW, involvement in similar efforts (watershed planning, multi-benefit projects, etc.), and existing relationships/partnerships. It is important that the TAC is able to provide region-specific input and understands the current challenges faced in the SBC SARW. The District has agreements in place with the TAC stakeholders and anticipates future partnership opportunities will come out of the SWRP development. **Table 3-1** summarizes the key stakeholders invited to participate in the TAC and their role/responsibility.

Table 3-1 TAC Roles and Responsibilities

Agency	Status	Role/Responsibility
Bureau of Reclamation	Unable to Participate	Not applicable
Chino Basin Water Conservation District	Active	Guidance on water accounting and project selection
Inland Empire Utilities Agency (IEUA)	Active	Guidance on water supply, waste water, recycled water and joint use project selection
Riverside County Flood Control and Water Conservation District (RCFCWCD)	Invited, No Response	Not applicable
RWQCB	Active	Guidance on permit requirements and project selection

Agency	Status	Role/Responsibility
Santa Ana Watershed Project Authority (SAWPA)	Active	Guidance on regional water and project selection
San Bernardino County Department of Public Works, National Pollutant Discharge Elimination System (NPDES)	Active	TAC lead
San Bernardino County Flood Control District, Flood Planning	Active	Guidance on flood control and project selection
San Bernardino Valley Municipal Water District (SBVMWD)	Active	Guidance on water supply, groundwater recharge and project selection
Western Municipal Water District (WMWD)	Pending	Guidance on groundwater recharge in service area and project selection

3.2 Tentative Schedule

Table 3-2 summarizes the TAC meeting schedule and meeting purpose, which includes the kickoff meeting and three additional meetings. At the time this SPOEEP was prepared, the kickoff meeting and one additional meeting had been held. The schedule and scope for the last two meetings are tentative and may change.

Table 3-2 Tentative TAC Meeting Schedule and Purpose

TAC Meeting	Schedule	Purpose
Kickoff Meeting	April 12, 2017	➢ Present background/overview of SBC SARW SWRP ➢ Define roles and responsibilities ➢ Discuss water management goals and objectives ➢ Outline TAC involvement and schedule
Meeting #2	July 6, 2017	➢ Examine quantifiable benefit goals and targets to be included in the SWRP ➢ Review multi-benefit projects identified in other planning documents that may be included in the SBC SARW SWRP ➢ Identify data needed for projects to quantify benefits
Meeting #3	Late August 2017	➢ Present/discuss results associated with benefit quantification for example projects ➢ Collaborate on project concepts ➢ Evaluate opportunities to enhance projects to provide additional benefits
Meeting #4	December 2017	➢ Walk through the Draft SBC SARW SWRP ➢ Discuss structure and key sections ➢ Solicit feedback, comments, questions, and suggestions

4. Stakeholder Outreach

Two (2) stakeholder outreach events will be held during the development of the SBC SARW SWRP, consistent with the Grant Agreement requirements. The goals of the stakeholder outreach event are:

1. Collect information regarding challenges faced in relationship to water quality, water supply, flood management, environmental, and the community;
2. Gather details pertaining to current projects and programs conceptualized, planned, and implemented;
3. Solicit project/program ideas to be included in the SWRP; and
4. Obtain data pertinent to quantifying project/program benefits, including, but not limited to, monitoring data, flood studies, project/program concepts, system operations, etc.

The District will utilize the stakeholder events to solicit technical information and identify projects/programs that include partnerships with the District and/or are mutually beneficial. The stakeholder events will also promote education, as the District will share details pertaining to the SBC SARW SWRP, which will increase awareness and encourage support. It is important to include local stakeholders in the region throughout the SWRP development, as partnerships may be formed and local support will lead to a successful plan and projects/programs implementation.

4.1 Potential Participants

Potential participants in the stakeholder event will include the stakeholders participating in the TAC along with additional local stakeholders. Opportunities to include elected and appointed officials, municipal and county staff, watershed groups, local water agencies, and non-governmental organizations, along with other stakeholders, have been and will continue to be evaluated. The TAC will work together to compile lists of stakeholders that have participated in outreach efforts of similar scope/magnitude. **Table 4-1** identifies potential participants. This list will be further refined prior to the stakeholder outreach event.

Table 4-1 Potential Participants for the Stakeholder Outreach Events

Stakeholder Category	Potential Stakeholders
Elected/appointed officials	To be determined
Local municipalities	Big Bear Lake, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland, and Yucaipa
Neighboring counties	Orange County (Department of Public Works and Flood Control District) Riverside County (RCFCWCD)
Non-governmental organizations	Council for Watershed Health Inland Empire Waterkeeper
Regulators	RWQCB (Santa Ana) SWRCB United States Army Corps of Engineers

Stakeholder Category	Potential Stakeholders
SBC departments	Flood Control District Public Health (Mosquito and Vector Control) Public Works Regional Parks Special Districts
Water agencies and member agencies	Big Bear Municipal Water District (BBMWD) – Big Bear Municipal Water Company
	Chino Basin Water Conservation District/Watermaster
	IEUA – Cities of Chino, Chino Hills, Ontario, and Upland, Crawford Canyon Municipal Water Company, Cucamonga Valley Water District, Fontana Water Company, Monte Vista Water District, and San Antonio Water Company
	SBVMWD – Cities of Colton, Loma Linda, Redlands, and Rialto, East Valley Water District, Marygold Mutual Water Company, Muscoy Mutual Water Company, Riverside Highland Water Company, San Bernardino Municipal Water District, San Bernardino Valley Conservation District, South Mesa Water Company, Terrace Water Company, West Valley Water District, Western Heights Water Company, and Yucaipa Valley Water District
	Six Basins Watermaster
	WMWD
	Warren Valley Basin Watermaster
	Other – City of Big Bear Lake Water Department, Big Bear City Community Service District, Fallsvale Service Company, Lake Arrowhead Community Services District, Lytle Creek Springs Water Company, and Running Springs Water District
Watershed groups	Middle Santa Ana River Total Maximum Daily Load (TMDL) Task Force SAWPA
Other agencies	Bureau of Reclamation California Department of Transportation California State Parks Department of Water Resources (DWR) School Districts United States Forest Service (Trails Unlimited)

The District will contact potential participant agencies/organizations in an effort to identify the personnel that would best serve as the stakeholder representative. If these potential participant agencies have been involved in outreach efforts implemented by members of the TAC, then contact information obtained at those events will be utilized if possible. Invitations will be distributed by email, when possible, and mail. The District will evaluate opportunities to utilize Doodle Poll or a similar web application to collect information on availability. A running list of agencies/organizations and personnel invited will be tracked along with their responses.

4.2 Event Format

The main purpose of the stakeholder events will be to identify projects/programs for inclusion in the SWRP. The District will seek opportunities to partner with local stakeholders in the implementation of projects/programs that provide multiple benefits (combination of water quality, water supply, flood management, community, and environmental benefits). It is anticipated that the stakeholder outreach events will be no longer than 1.5 hours. The tentative agenda is provided below. Ample time will be set aside to answer questions and listen to comments and concerns. In contrast to the format of the public outreach event described in **Section 5.2**, the stakeholder event will be structured more like a conversation rather than a presentation, while a presentation will be used to support discussions.

1. Project background (Proposition 1)
2. Goals of stakeholder outreach
3. Goals of the SBC SARW SWRP
4. SWRP overview
5. Quantifiable benefits
    a. Water quality
    b. Water supply
    c. Flood management
    d. Environmental
    e. Community
6. Potential projects
    a. Project types
    b. Partnerships
    c. Data needs
7. Next steps
8. Questions and answers

Only one agenda is identified in this section, as the District will conduct two stakeholder events that focus on the same topic, as further detailed in **Section 4.3**. A sign-in sheet will be used to gather information on the participants, which will be used to send out updates on the SWRP, as it would be beneficial if the stakeholders reviewed the SWRP during the public review period. Hard copies of the agenda will be distributed along with informational handouts as determined to be helpful. The information identified in the agenda will be presented utilizing a PowerPoint presentation, while discussions will be encouraged. Comment cards will be available to encourage attendees to leave feedback.

4.3 Tentative Schedule

The stakeholder outreach events will be held in mid-August. Due to the large area the SBC SARW covers, the two stakeholder outreach events will be of a similar format and hosted at two different locations, one on the east side of the SBC SARW and the other on the west. This will encourage

stakeholders throughout the watershed to participate. It is anticipated that these events will be held during business hours and the locations will be further evaluated. The District will evaluate opportunities to utilize Doodle Poll or a similar web application to collect information on availability, which will provide useful information regarding the schedule of the stakeholder events. Invitations will be distributed a few weeks in advance, such that a preliminary head count can be determined prior to the event.

5. Public Outreach

One (1) public outreach event will be held during the SBC SARW SWRP development, as required in the Grant Agreement. The goals of the public outreach event are:

1. Educate the public (additional education information in **Section 6**);
2. Rally community support for the SBC SARW SWRP; and
3. Encourage the public to review the document and provide input.

It is important that the public is aware of the effort being made by the District to develop the SWRP and are in support of the development and implementation. The SWRP will be posted for public review and the public outreach event will serve as an advertisement and introduction. The public is more likely to review the SWRP and provide meaningful comments if they have a base understanding of the efforts made, SWRP development process, and contents. This section details how potential participants will be invited, event format, and schedule.

5.1 Potential Participants

The general public will be solicited for involvement in the public outreach event rather than specific audiences. Alternatively, the goal will be to advertise as much as possible for the outreach event in an effort to identify participants. Existing platforms will be used when possible, as mentioned below. Invitations for the public outreach event will be posted online on the District's website, distributed via email, and will be available in printed format at the District office.

The San Bernardino County Areawide Stormwater Program (Areawide Program) consists of the District, San Bernardino County, and 16 municipalities within the County, all of which are located within the SBC SARW SWRP. The Areawide Program has been implementing an outreach program for several years that pertains mostly to stormwater quality. Over the past few years, the Areawide Program has focused on collecting email addresses, which are used to share information related to the Arewide Program and associated events. The District will work with the Areawide Program to distribute invitations to the SWRP public outreach event to the community currently involved in outreach efforts implemented by the Areawide Program. This is a good audience to focus on, as they have some knowledge of stormwater quality and shown interest in the stormwater program.

The SBC SARW SWRP TAC will be solicited for similar types of mailing groups. Agencies involved in the TAC implementation projects and programs that include community outreach. The District will look for opportunities to leverage those existing relationships in an effort to encourage participation in the SBC SARW SWRP public outreach event. These email lists will be utilized, if available, to distribute the invitation.

In addition to email invites, invitations will be posted on Facebook. The District will post invitations on the San Bernardino County and San Bernardino County Department of Public Works Facebook pages. The District will also coordinate with the Areawide Program to post on their Facebook page. The SBC SARW SWRP TAC members will be consulted to determine if their agencies can post on their Facebook pages and/or they will be tagged in the original post in an effort to reach a larger audience. Opportunities to utilize other social media platforms, such as Twitter, will also be explored.

Print invitations will also be utilized. The invitation will be posted in local newspapers and printed versions will be available at the District office near other print materials. A website will be created that will allow potential participants to RSVP, such as Eventbrite or a similar platform. This will allow the District to have a general idea as to how many participants will attend the event. The sign-in sheet at the public outreach event will ask how each participant heard of the event. This will provide useful data that may be referenced for future public outreach events, such as those that may be conducted during the SWRP implementation.

5.2 Event Format

As described in the goals above, the event will be structured in a way that will educate attendees by providing general background information and details specific to the SBC SARW SWRP. It is anticipated that the public outreach event will be no longer than 1.5 hours. The tentative agenda is provided below. Ample time will be set aside to answer questions and listen to public comments and concerns.

1. Project background (Proposition 1)
2. Goals of public outreach
3. Goals of the SBC SARW SWRP
4. SWRP overview (aligns with SWRP structure)
    a. Watershed identification
    b. Water quality compliance
    c. Organizations, coordination, and collaboration
    d. Quantitative methods
    e. Identification and prioritization of projects
    f. Implementation strategy and schedule
    g. Education, outreach, and public participation
5. SWRP public review
6. Next steps
7. Questions and answers

A sign-in sheet will be used to gather information on the participants, which will be used to send out reminders regarding the public review of the SWRP. Hard copies of the agenda will be distributed along with informational handouts as determined to be helpful throughout the SWRP development. The information identified in the agenda will be presented utilizing a PowerPoint presentation. Comment cards will be available to encourage attendees to leave feedback.

5.3 Tentative Schedule

The SWRP public outreach event will be held near the date the draft SWRP is posted for public review (before or just after it is posted). The draft SWRP will tentatively be posted for public review in early February 2018. This event will be used to encourage the public to review the SWRP and provide

feedback. It will also be used to rally public support of the SWRP, which is important, as support will encourage long-term success. The District will evaluate opportunities to hold the outreach event during the day or in the evening. Different locations will also be evaluated, as the SBC SARW covers a large area and it will be important to find a central location.

6. Education

The District sees the SBC SARW SWRP development as an opportunity to educate local stakeholders and the public. In addition to the stakeholder and public outreach events described in **Section 4** and **Section 5**, education will be promoted through printed materials, a SWRP webpage, and social media, each of which are further described in the subsections below.

6.1 Printed Materials

Printed materials will be developed in an effort to educate stakeholders and the public. As the SBC SARW SWRP development progresses, the contents of the printed materials will be further defined. Printed materials may include graphic posters, postcards, and/or brochures. The goals of the printed materials are to simply convey through illustrations and minimal text:

1. What is a SWRP?
2. Why is a SWRP necessary?
3. What types of solutions are included in the SBC SARW SWRP?

Printed material will highlight the multiple benefits that will be provided through the SBC SARW SWRP implementation (water quality, water supply, flood management, environmental, and community benefits). Printed materials will also be used to advertise the stakeholder and public outreach events and solicit public review and comment of the SWRP. Printed material will be available at the District's office and outreach events. The District will evaluate opportunities to provide educational material to educational institutes, which may be dependent on their involvement in the outreach events. In addition to printed material, the contents of these materials will be posted on the SWRP webpage and social media accounts, as described in **Section 6.2** and **Section 6.3**, respectively. The District will evaluate opportunities to prepare materials in both English and Spanish.

6.2 SWRP Webpage

The District will develop a webpage on their website that provides information on the SBC SARW SWRP development, consistent with the SWRP Guidelines, which state that SWRP information must be accessible to the stakeholders and public. The webpage will provide an overview of what the SWRP is and will include announcements as necessary. For example, announcements will be posted regarding the outreach events and public comment period (schedule, start, end, etc.). The webpage will include links to download educational materials, as detailed in **Section 6.1**. During the public review period, the Draft SBC SARW SWRP will be posted on this webpage and the ability to provide comments and feedback will be enabled. The webpage will provide contact information, which will allow interested parties to contact key personnel. The webpage will allow stakeholder and the public to easily find information specific to the SBC SARW SWRP development and support the outreach and education efforts described in this SPOEEP.

6.3 Social Media

Opportunities to utilize social media will be evaluated throughout the SBC SARW SWRP development. It is anticipated that, at a minimum, Facebook will be utilized to support education and outreach efforts. Facebook would be used to post educational materials, as detailed in **Section 6.1**, encourage local engagement and support, and advertise events (outreach and public review). The District will work with the Areawide Program to utilize their Facebook page, either through a direct post or by sharing a post made on the San Bernardino County Department of Public Works Facebook page. Working with the Areawide Program would be beneficial, as there is a large following currently and the followers are aware of stormwater issues and programs, thus represent a target audience.

The District will also encourage the TAC agencies/organizations to share posts related to the SBC SARW SWRP, or these agencies/organizations may be tagged in the posts. This will allow the posted materials to reach a larger audience. **Table 6-1** summarizes the current number of followers for the San Bernardino County Department of Public Works, Areawide Program, and TAC agencies/organizations (as of July 2017). The District will also evaluate opportunities to utilize other social media platforms, such as Twitter.

Table 6-1 Summary of Facebook Pages and Number of Followers

Facebook Page	Number of Followers
San Bernardino County Department of Public Works	608
Areawide Program	13,103
TAC Agencies/Organizations	
Chino Basin Water Conservation District	1,222
IEUA	404
RWQCB (Santa Ana)	-
SAWPA	153
SBVMWD	-
WMWD	643

7. Alignment with SWRP Guidelines

Section VI.F of the SWRP Guidelines identifies guidance related to education, outreach, and public participation based on the Water Code. This section clearly explains how the stakeholder and public outreach, education, and engagement implemented throughout the SBC SARW SWRP development are in alignment with the SWRP Guidelines. The SWRP Guidelines identify the following goals for stakeholder and public outreach, education, and engagement. Subsections below address each item in order.

i. Public education and public participation opportunities to engage the public when considering major technical and policy issues related to the development and implementation of the plan;

ii. Mechanisms, processes, and milestones that have been or will be used to facilitate public participation and communication during development and implementation of the plan;

iii. Mechanisms to engage members of affected communities in project design and implementation;

iv. Identification and inclusion of specific audiences including local ratepayers, developers, locally regulated commercial and industrial stakeholders, non-governmental organizations, non-profit organizations, and the general public;

v. Strategies to engage disadvantaged and climate vulnerable communities within the SWRP boundaries and ongoing facilitation and tracking of their involvement in the planning process;

vi. Efforts to identify and address specific, runoff-related environmental injustice issues within the watershed; and

vii. A schedule for initial public engagement and education.

7.1 Consideration of Policy Issues

Stakeholders and the public will be consulted regarding technical and policy issues related to the development and implementation of the SWRP. Stakeholders through the TAC (**Section 3**) and at the stakeholder outreach events (**Section 4**) will be consulted on technical issues in different ways. The TAC is being consulted for guidance on the direction taken in the SWRP to quantify benefits, identify, and prioritize projects/programs from a technical standpoint. The public will also be engaged regarding technical and policy issues through the SWRP public review process. Guidance identified in this SPOEEP demonstrates that the District will work to engage stakeholder and the public in participating through printed materials, webpage, and social media (**Section 6**).

7.2 Mechanisms, Processes, and Milestones

Section 3, **Section 4**, and **Section 5** describe the mechanisms, processes, and milestones used to facilitate stakeholder and public participation and communication. The “Tentative Schedule” subsections in the sections referenced above describe the milestones utilized to schedule stakeholder and public outreach efforts. **Section 6** additionally details communication efforts through printed materials, webpage, and social media.

7.3 Engagement of Affected Communities

Section 6 describes the mechanisms used to engage the public and stakeholders, which will be used during the development of the SBC SARW SWRP and likely during implementation. These efforts may become more targeted during SWRP implementation within the affected communities, including both stakeholders and the public. Stakeholder and public outreach, education, and engagement efforts during the implementation of projects/programs identified in the SBC SARW SWRP will vary by project/program. The District will follow internal standard operating procedures, while projects/programs implemented by stakeholder partners will follow the lead implementing agency's procedures. Outreach efforts by either the District and/or partners will also follow guidelines identified by funding partners as applicable.

7.4 Identification and Inclusion of Specific Audiences

This SPOEEP identifies a variety of specific audiences to be included in both the stakeholder and public outreach, education, and engagement efforts, as identified in **Section 3**, **Section 4**, and **Section 5**. Audiences identified in the SWRP Guidelines, local ratepayers, developers, locally regulated commercial and industrial stakeholders, non-governmental organizations, non-profit organizations, and the general public, fall within the potential participants identified in the sections referenced above.

7.5 Strategies to Engage Disadvantaged Communities

Disadvantaged Communities (DACs) are defined as areas where the Median Household Income (MHI) is less than 80 percent of the statewide annual MHI. In addition, severely DACs are those areas where the MHI is less than 60 percent of the statewide annual MHI. DACs were mapped by DWR to better define geographies that meet DAC definitions based on census designated places (city/community boundaries), tracts (development areas), and blocks (smaller pockets of the community). As suggested in the definition, places are larger than tracts, which are larger than blocks. Based on the mapping published by DWR, illustrated in the figures below, 27 percent of the SBC SARW is considered a DAC tract and/or block. **Figure 7-1** illustrates the DAC tracts within the SBC SARW, while **Figure 7-2** illustrates the DAC blocks, and **Figure 7-3** illustrates the area covered by either a DAC tract and/or block.

The District will follow the approach described herein to communicate with stakeholders and the public in an effort to encourage outreach, education, and engagement with respect to the SBC SARW SWRP, which will include DACs. The District will ask for participants address and/or zip code in an effort to understand whether or not DACs were effectively reached and willing to participate. The District will evaluate opportunities to prepare printed material and webpage in both English and Spanish, which may better cater to existing DAC communities. Item iv described above also mentions climate vulnerable communities, which are not applicable in this region.

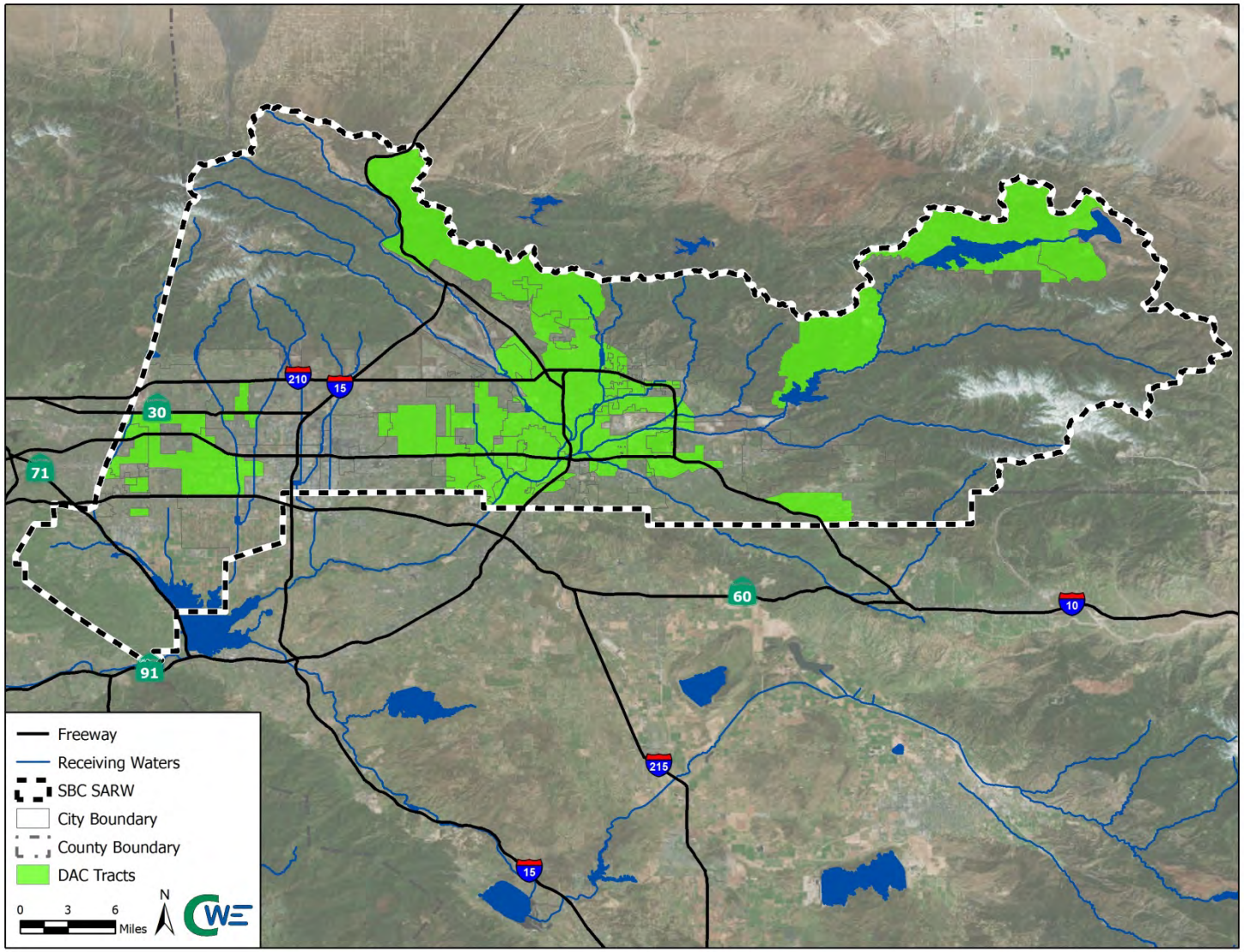


Figure 7-1 DAC Tracts within the SBC SARW

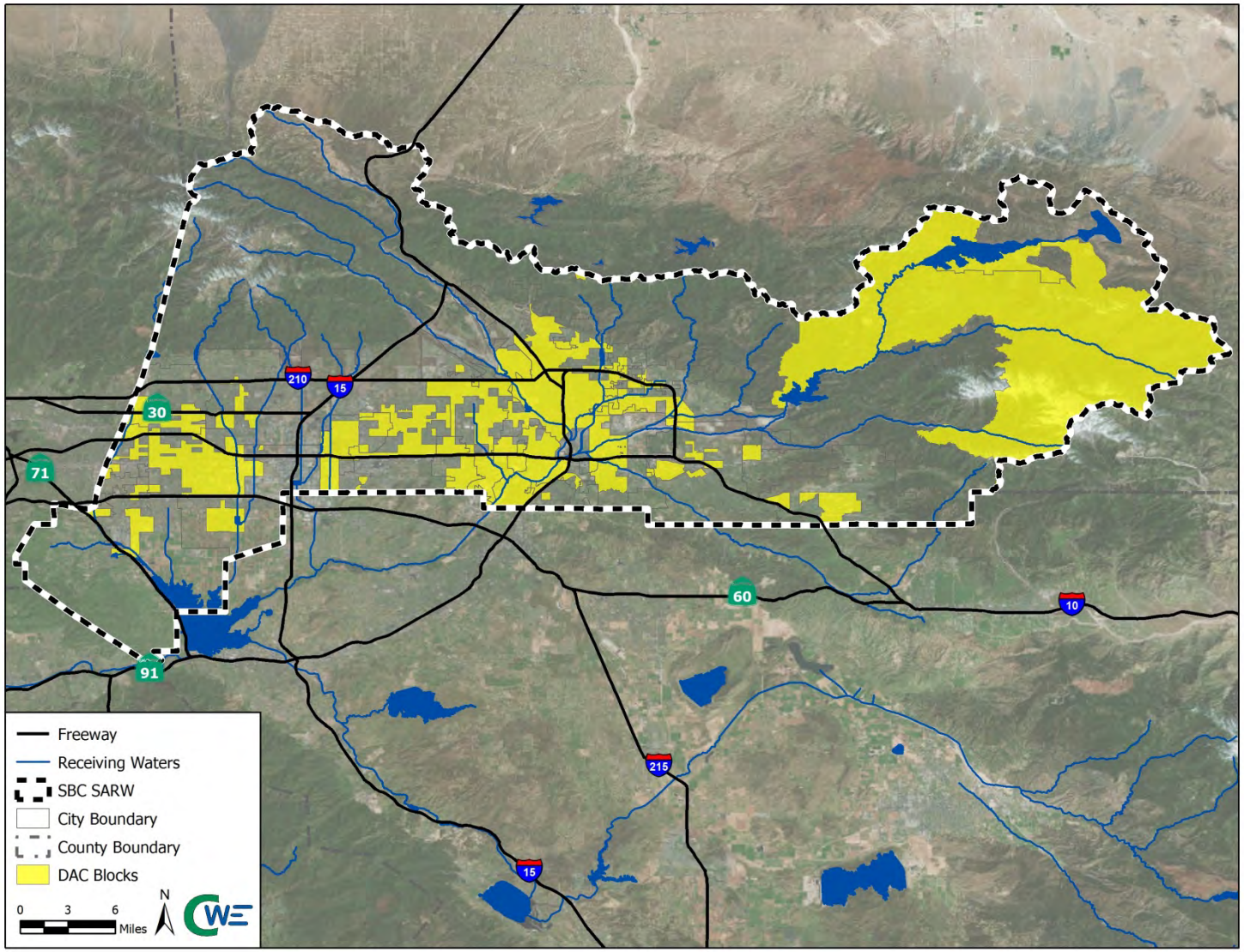


Figure 7-2 DAC Blocks within the SBC SARW

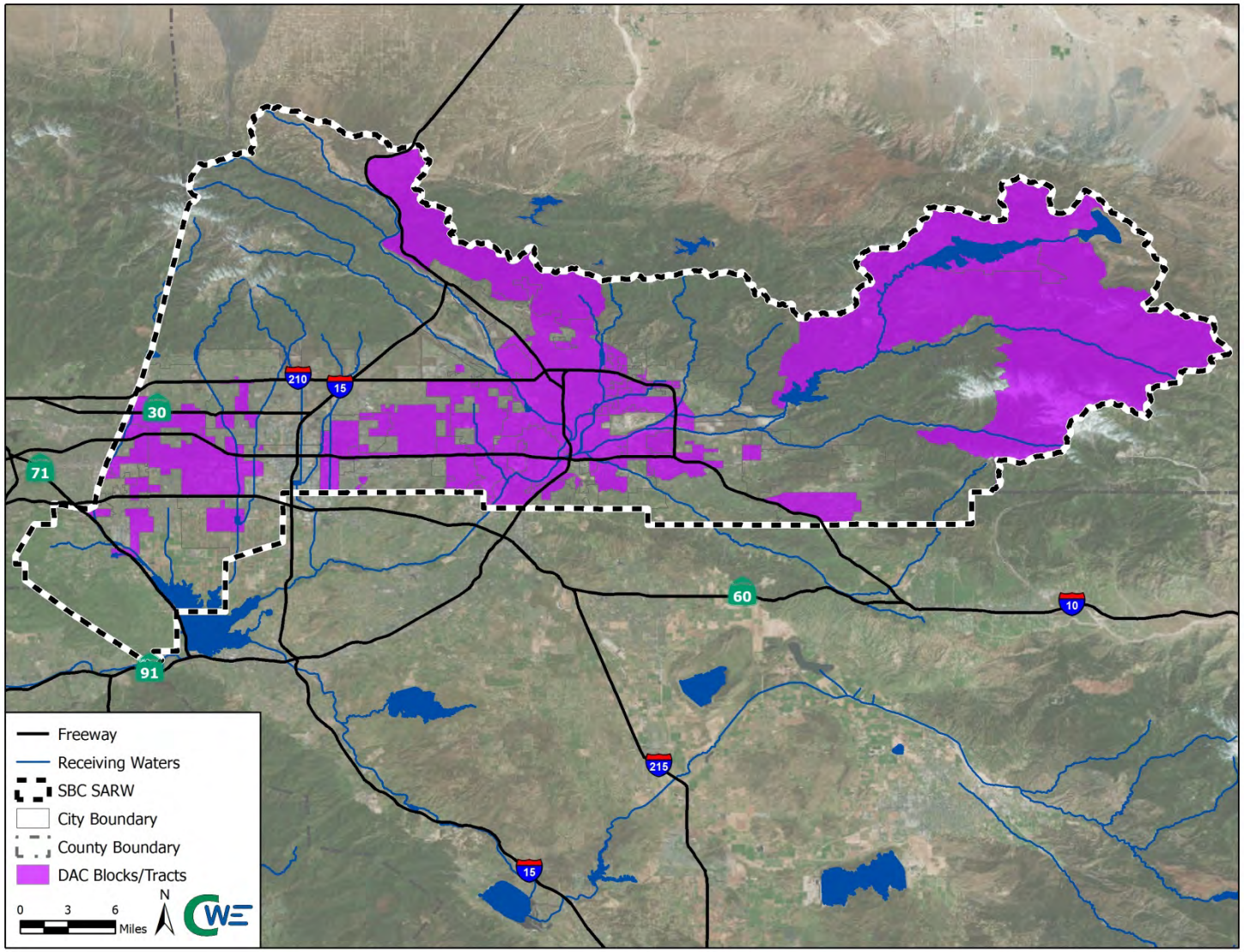


Figure 7-3 DAC Blocks and Tracts within the SBC SARW

7.6 Environmental Injustice Issues

When environmental injustice issues exist, it is common that they have a more significant impact on DACs. Including DACs in the stakeholder and public outreach, education, and engagement, as described in **Section 7.5**, may also address runoff-related environmental injustice issues, which may be of greater concern within DACs. Projects/programs will be identified in the SBC SARW SWRP which will address DACs and may in turn address and/or minimize runoff-related environmental injustice issues if they exist. Through the stakeholder and public outreach events, participants will be asked to share their concerns, such that solutions may be provided. These concerns may include runoff-related environmental injustice issues; therefore, by hosting these outreach events, these issues may be identified and addressed.

7.7 Schedule

The tentative schedule associated with stakeholder involvement in the TAC, stakeholder outreach, and public outreach is presented in **Section 3**, **Section 4**, and **Section 5**, respectively. The schedule for educational materials will be further evaluated during the SWRP development; however, it is anticipated the schedule for the release of material will closely follow the schedule for both the stakeholder and public outreach events. In summary, the schedule associated with stakeholder meetings through the TAC, stakeholder outreach events, and the public outreach event are summarized in **Table 7-1**.

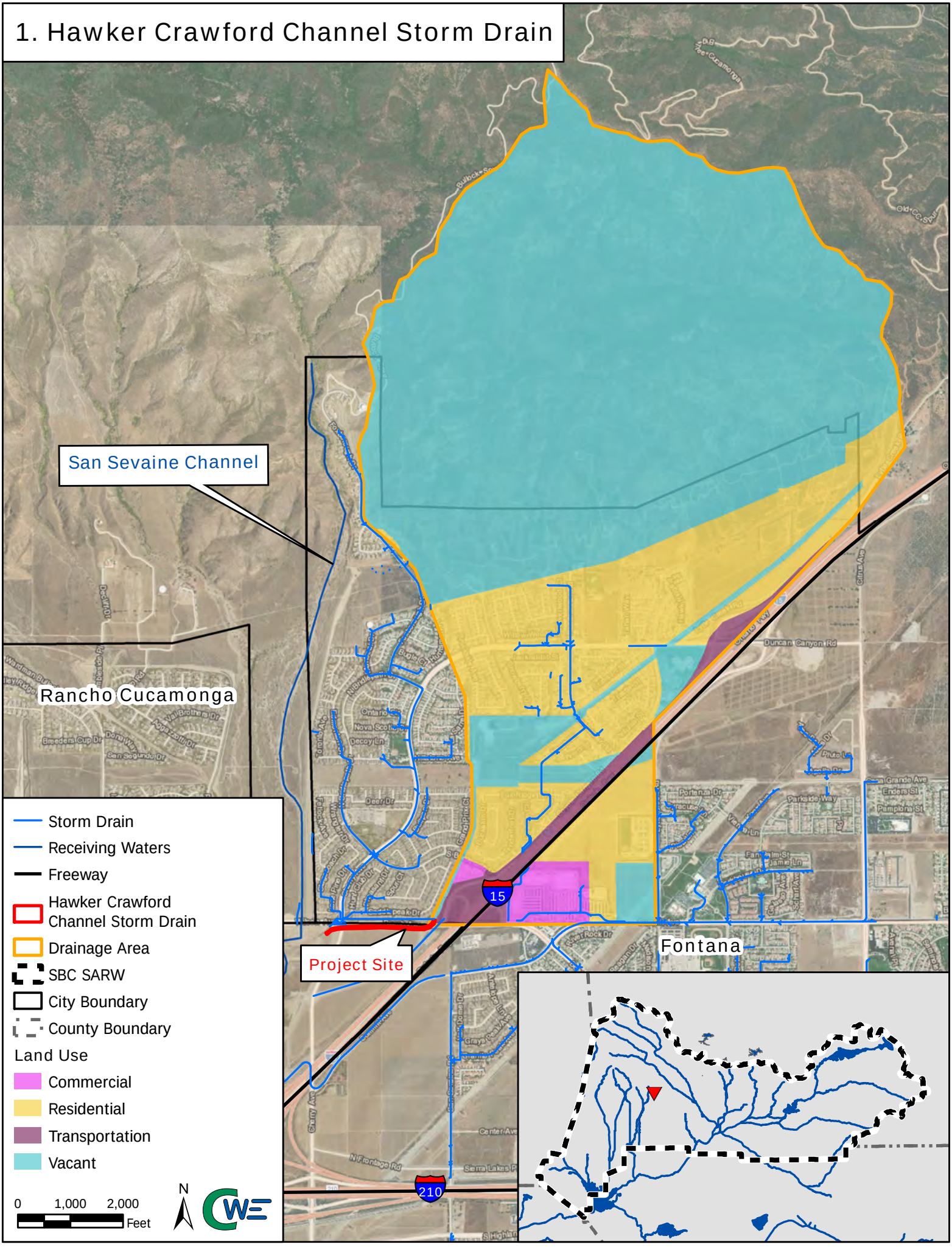
Table 7-1 Tentative Schedule

Audience	Event	Tentative Schedule
Stakeholder Meetings through the TAC	Kickoff Meeting	April 12, 2017
	Meeting #1	July 6, 2017
	Meeting #2	Late August 2017
	Meeting #3	December 2017
Stakeholder Outreach	Event #1	Mid-August 2017
	Event #2	
Public Outreach	Event #1	February 2018

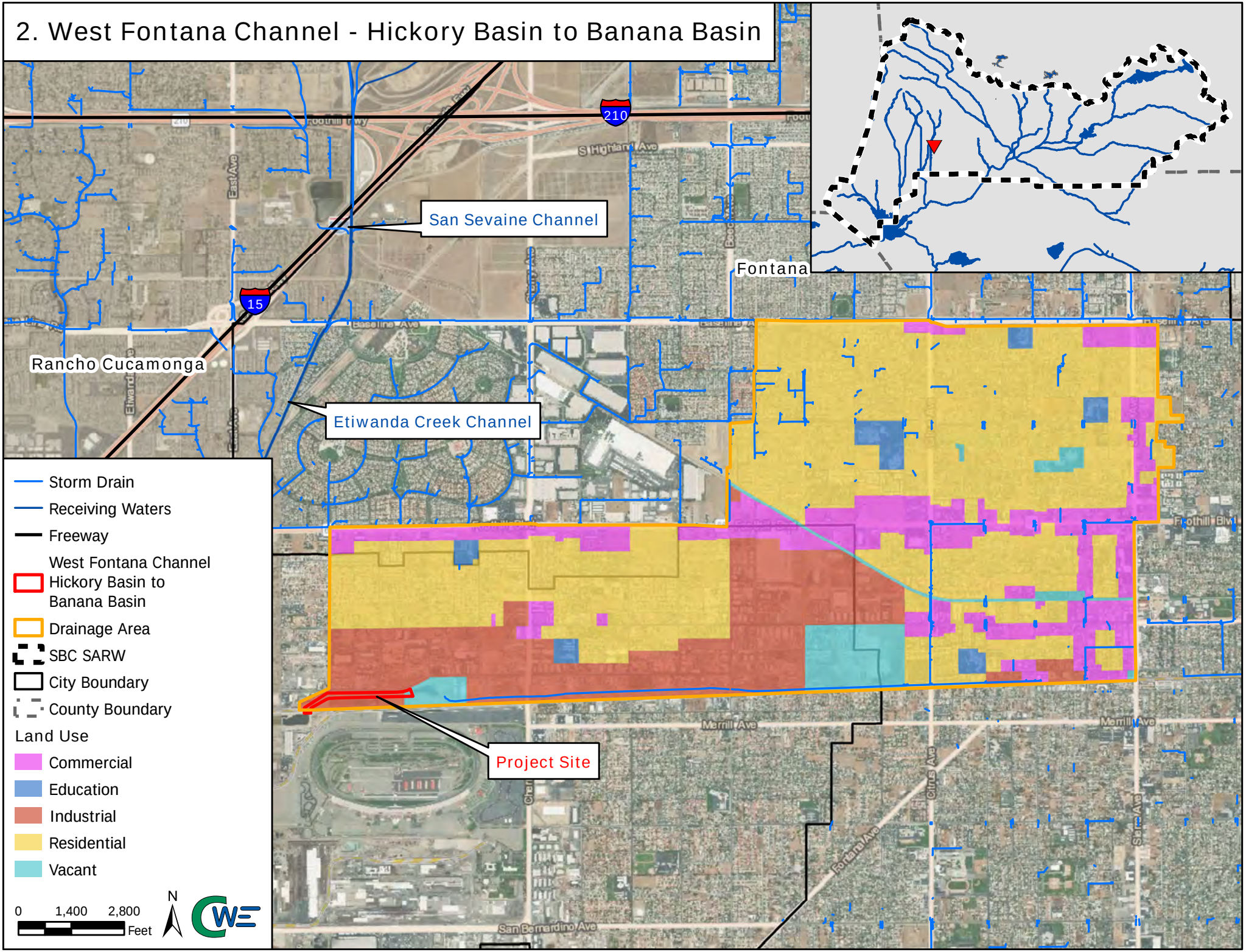
Attachment F

Project Figures

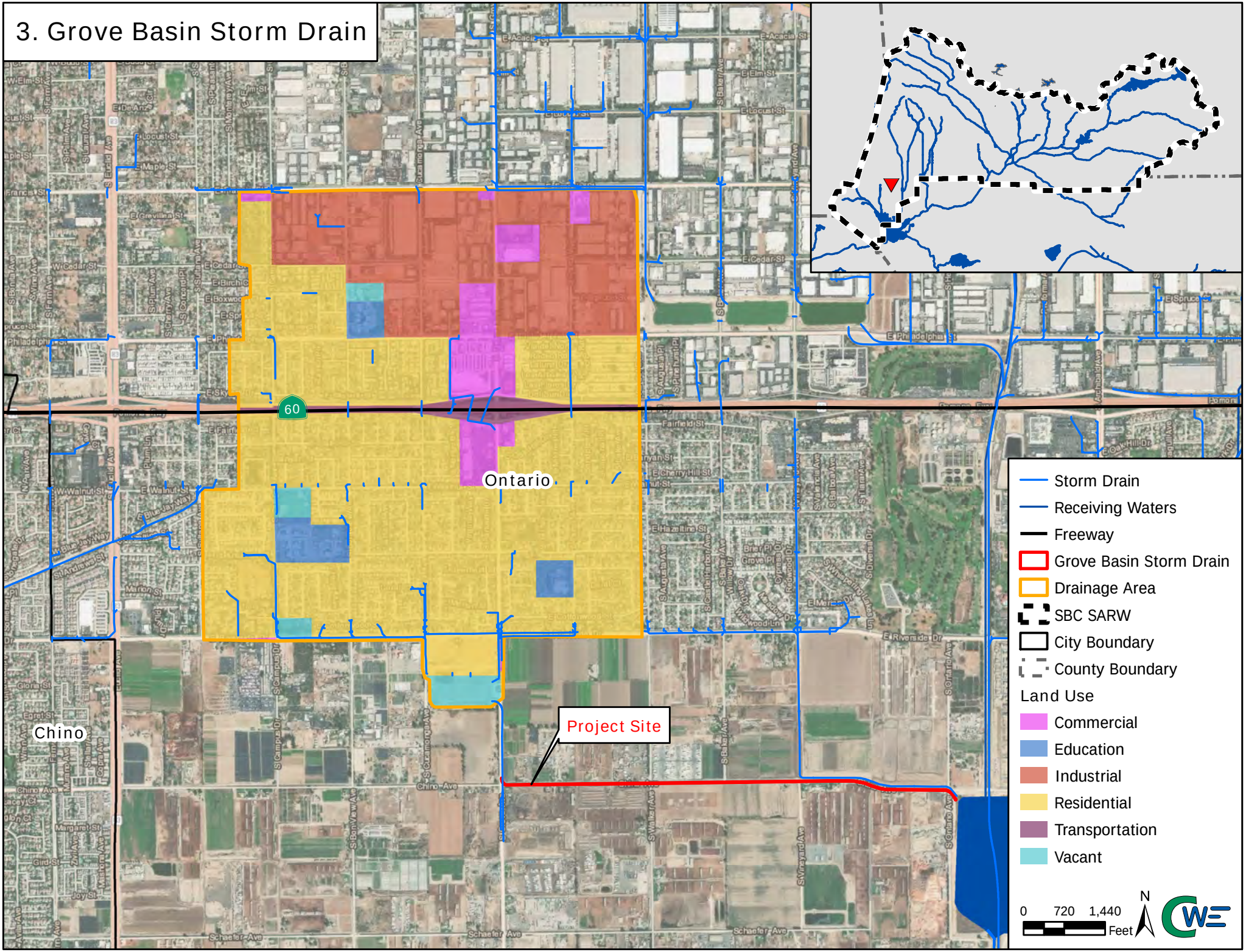
1. Hawker Crawford Channel Storm Drain



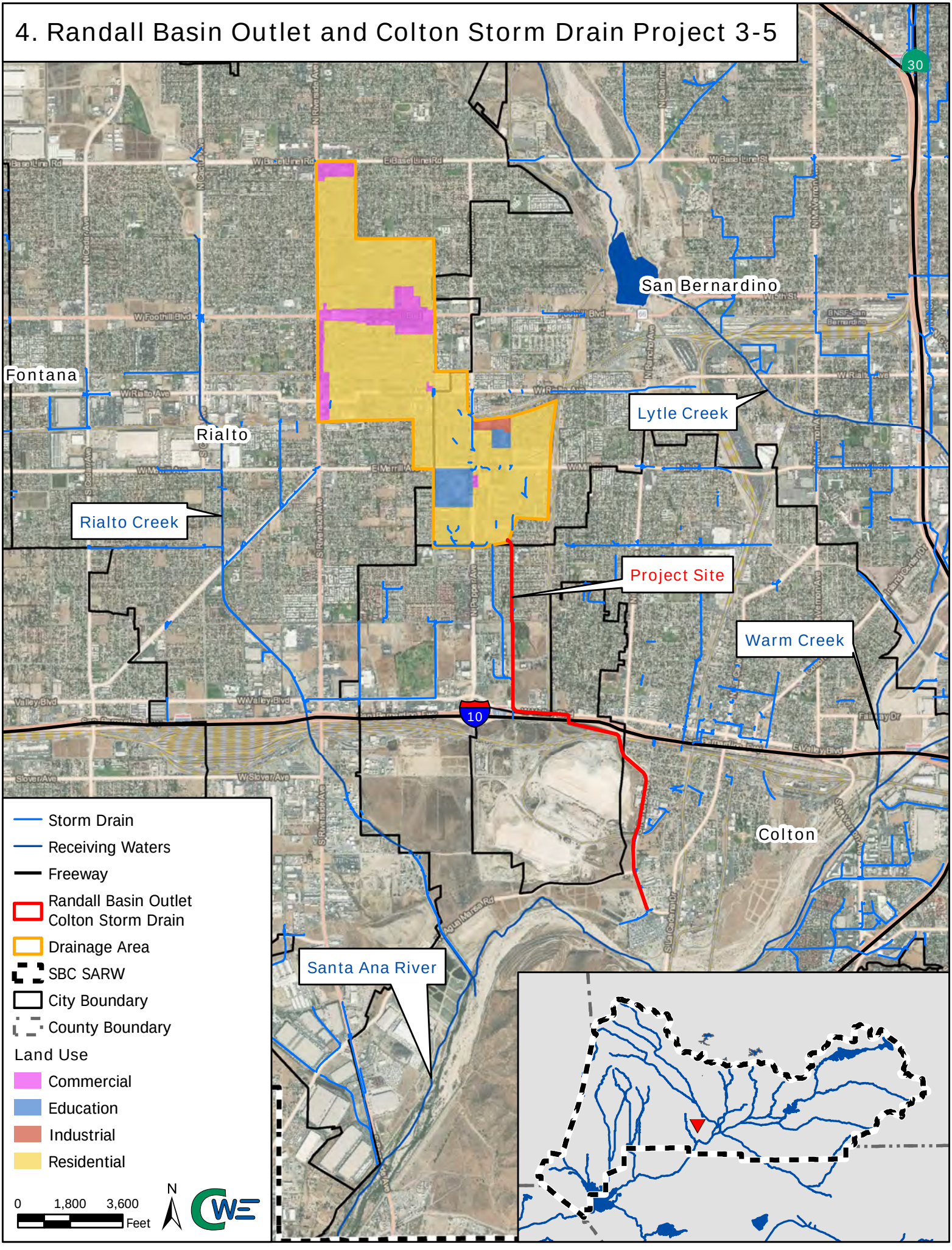
2. West Fontana Channel - Hickory Basin to Banana Basin

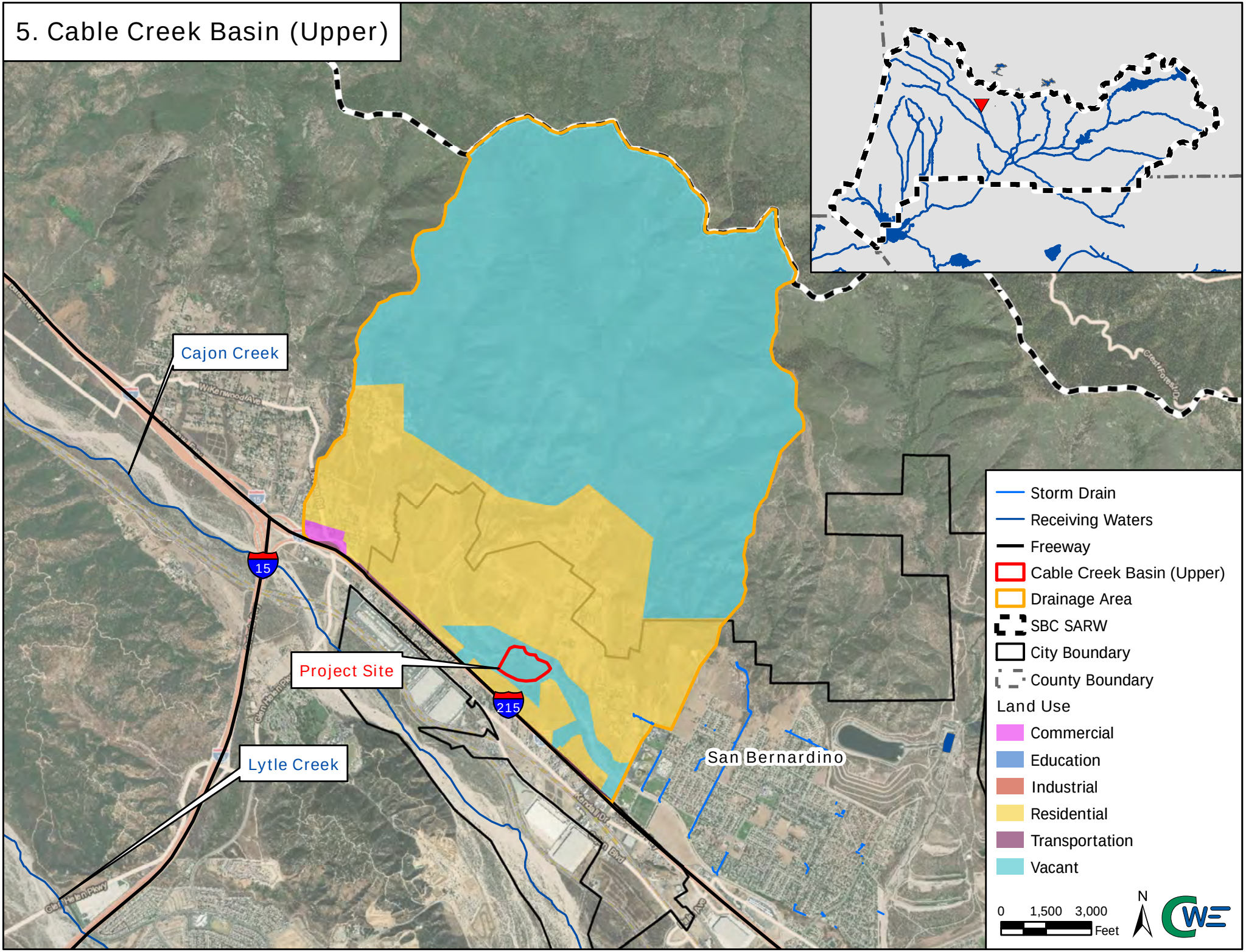


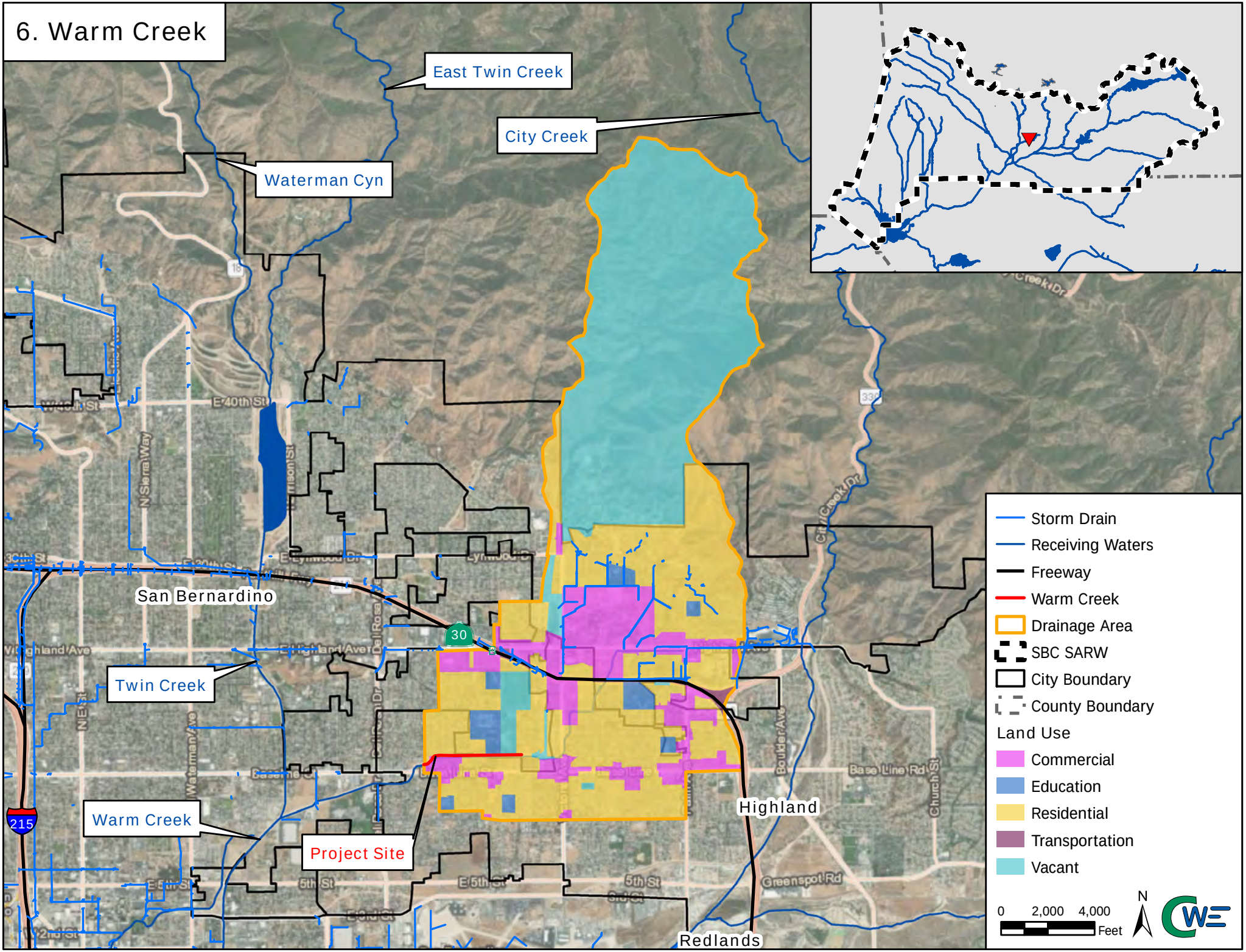
3. Grove Basin Storm Drain

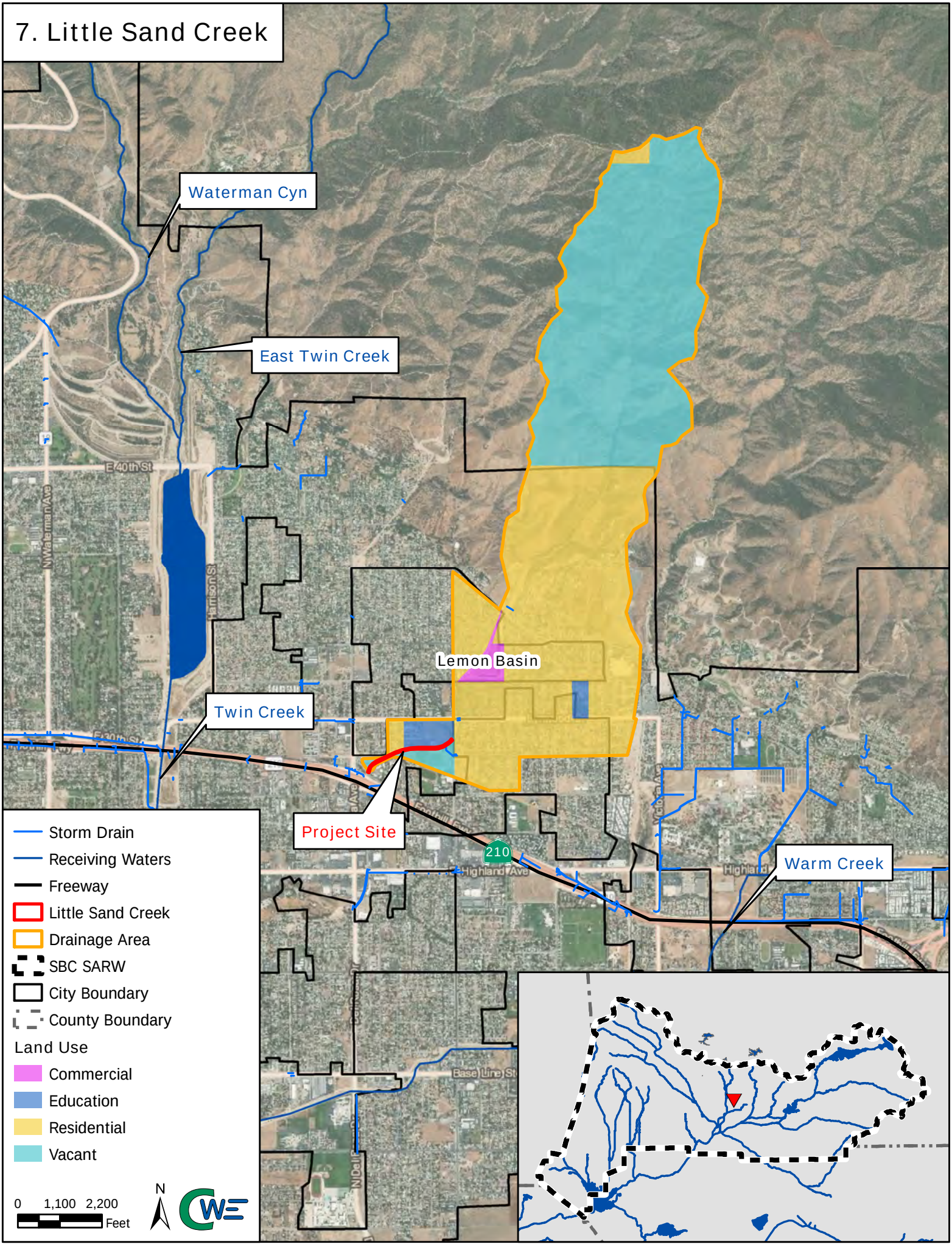


4. Randall Basin Outlet and Colton Storm Drain Project 3-5

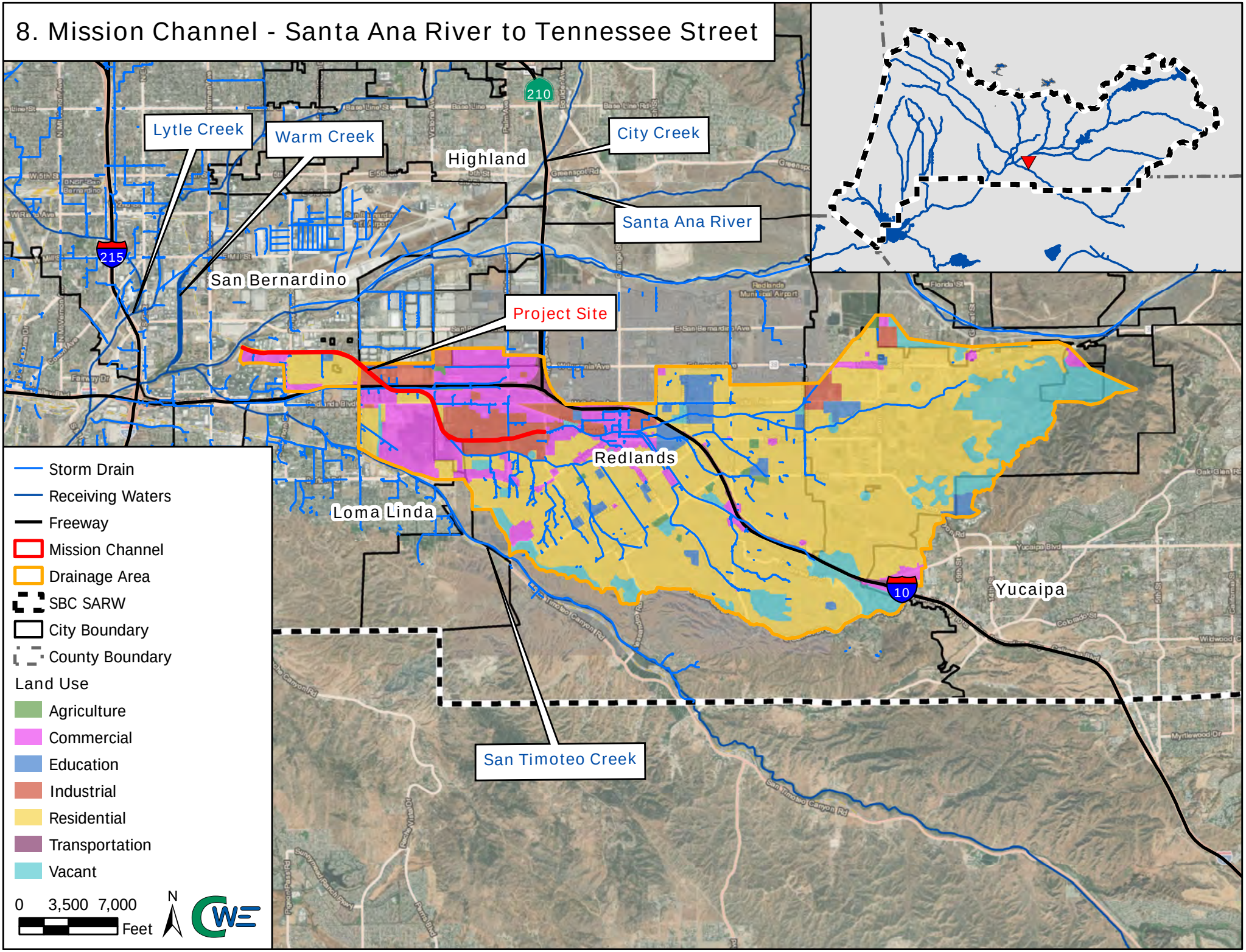



5. Cable Creek Basin (Upper)
Cajon Creek
Project Site
Lytle Creek
San Bernardino
15
215
Storm Drain
Receiving Waters
Freeway
Cable Creek Basin (Upper)
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
1,500
3,000
Feet
N

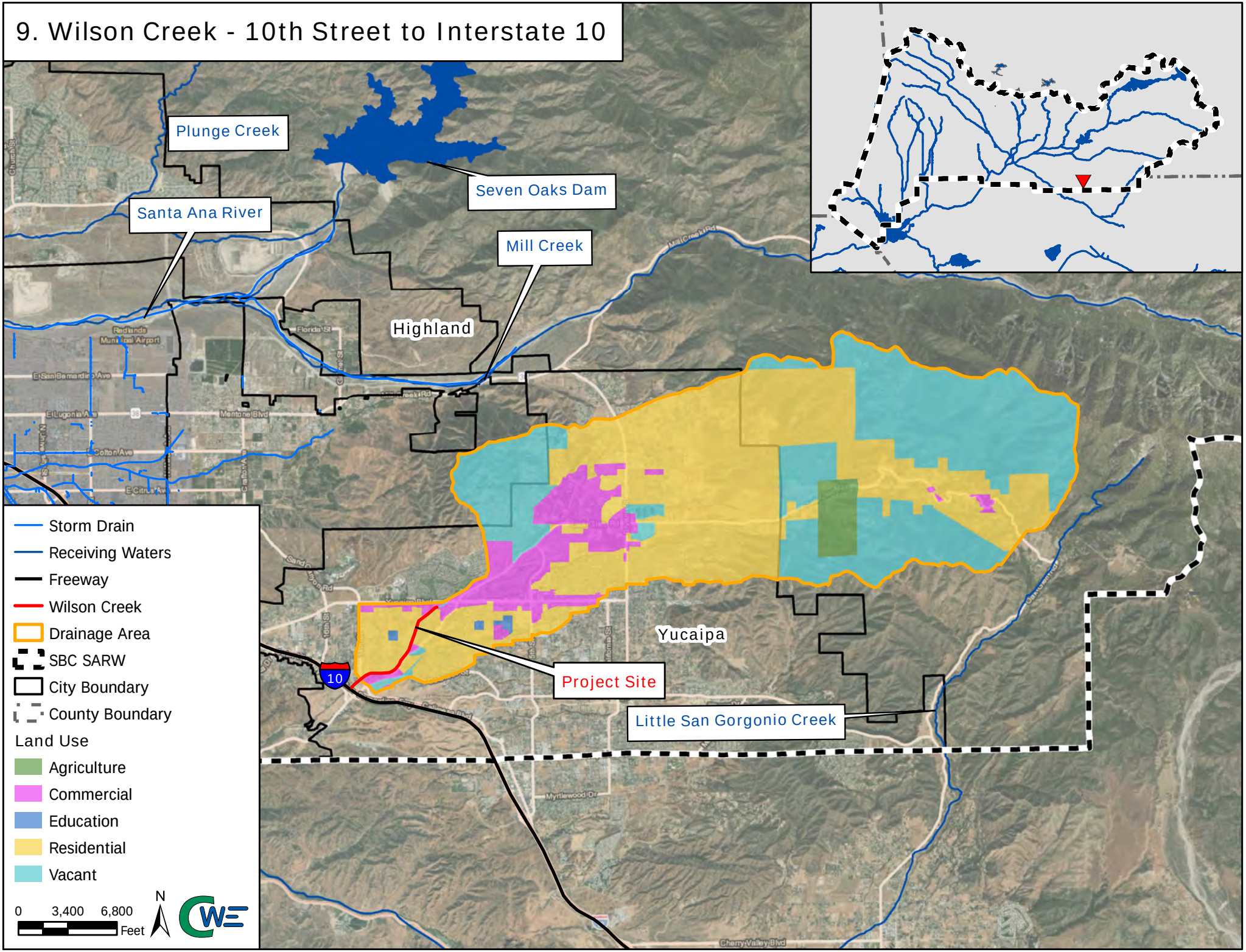

6. Warm Creek
East Twin Creek
City Creek
Waterman Cyn
San Bernardino
Twin Creek
Warm Creek
Project Site
Highland
Redlands
30
215
Storm Drain
Receiving Waters
Freeway
Warm Creek
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Residential
Transportation
Vacant
0 2,000 4,000
Feet
N


7. Little Sand Creek
Waterman Cyn
East Twin Creek
Lemon Basin
Twin Creek
Project Site
Warm Creek
E 40th St
N Waterman Ave
Harrison St
E 30th St
Highland Ave
210
Base Line St
Storm Drain
Receiving Waters
Freeway
Little Sand Creek
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Residential
Vacant
0 1,100 2,200
Feet
N

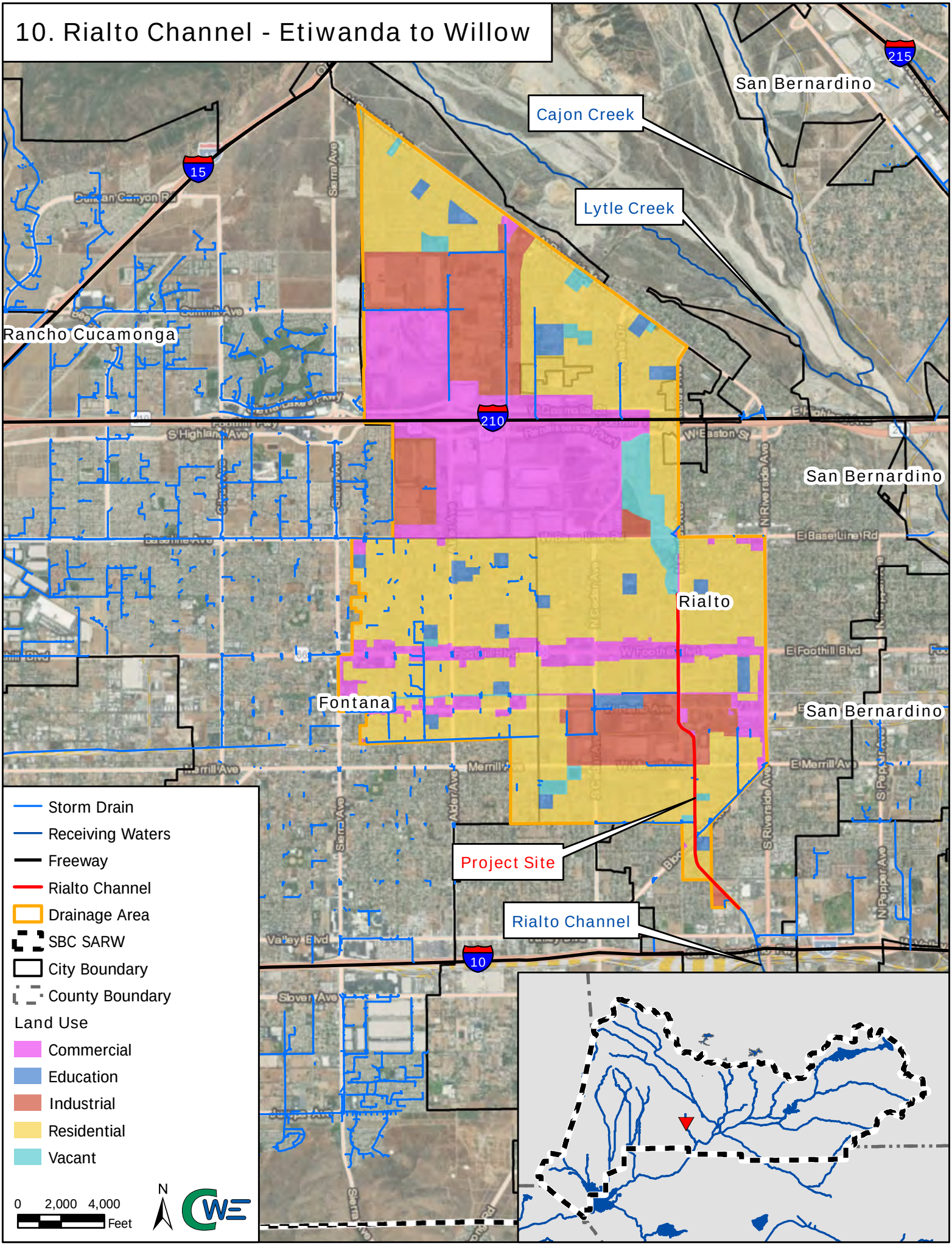
8. Mission Channel - Santa Ana River to Tennessee Street



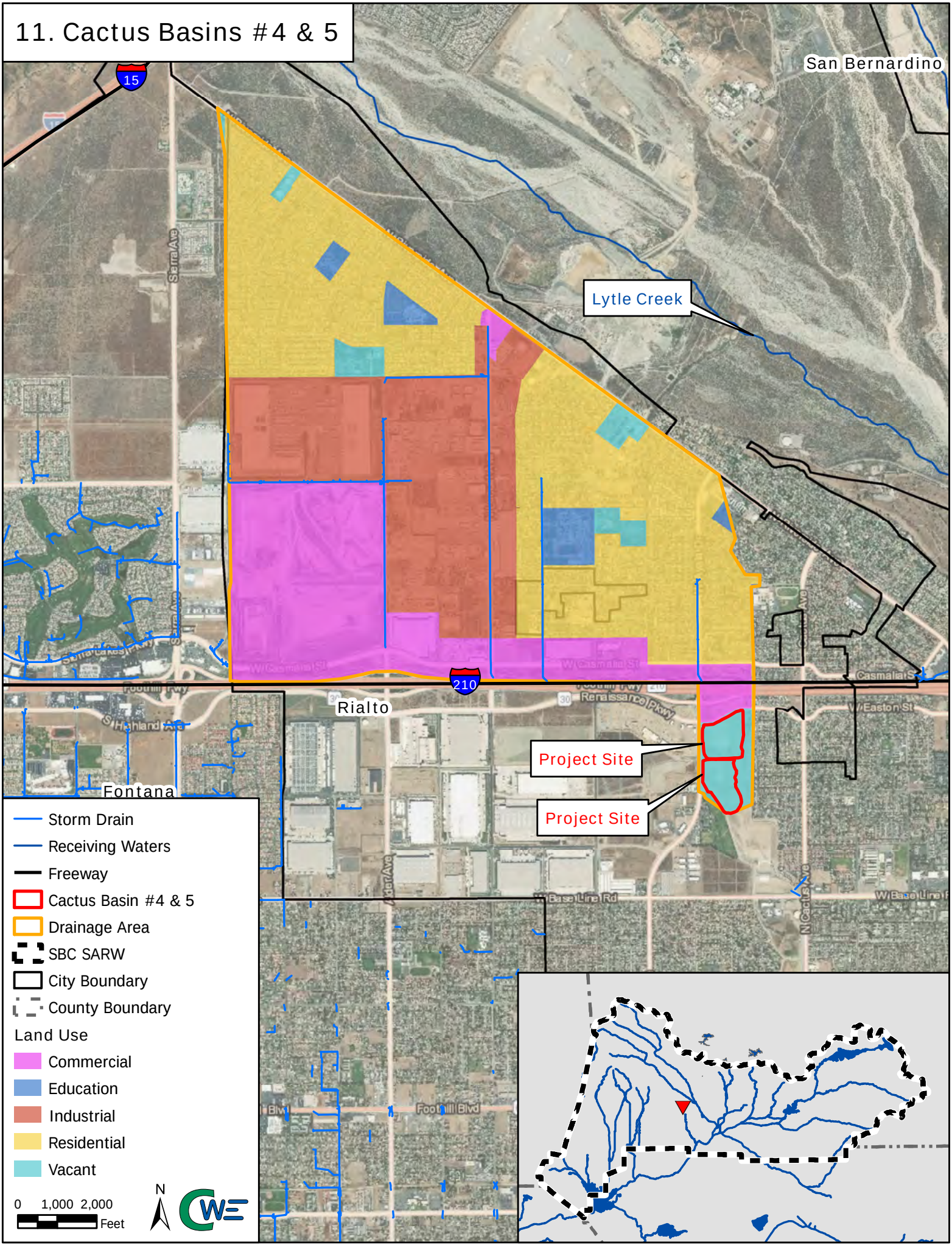
9. Wilson Creek - 10th Street to Interstate 10



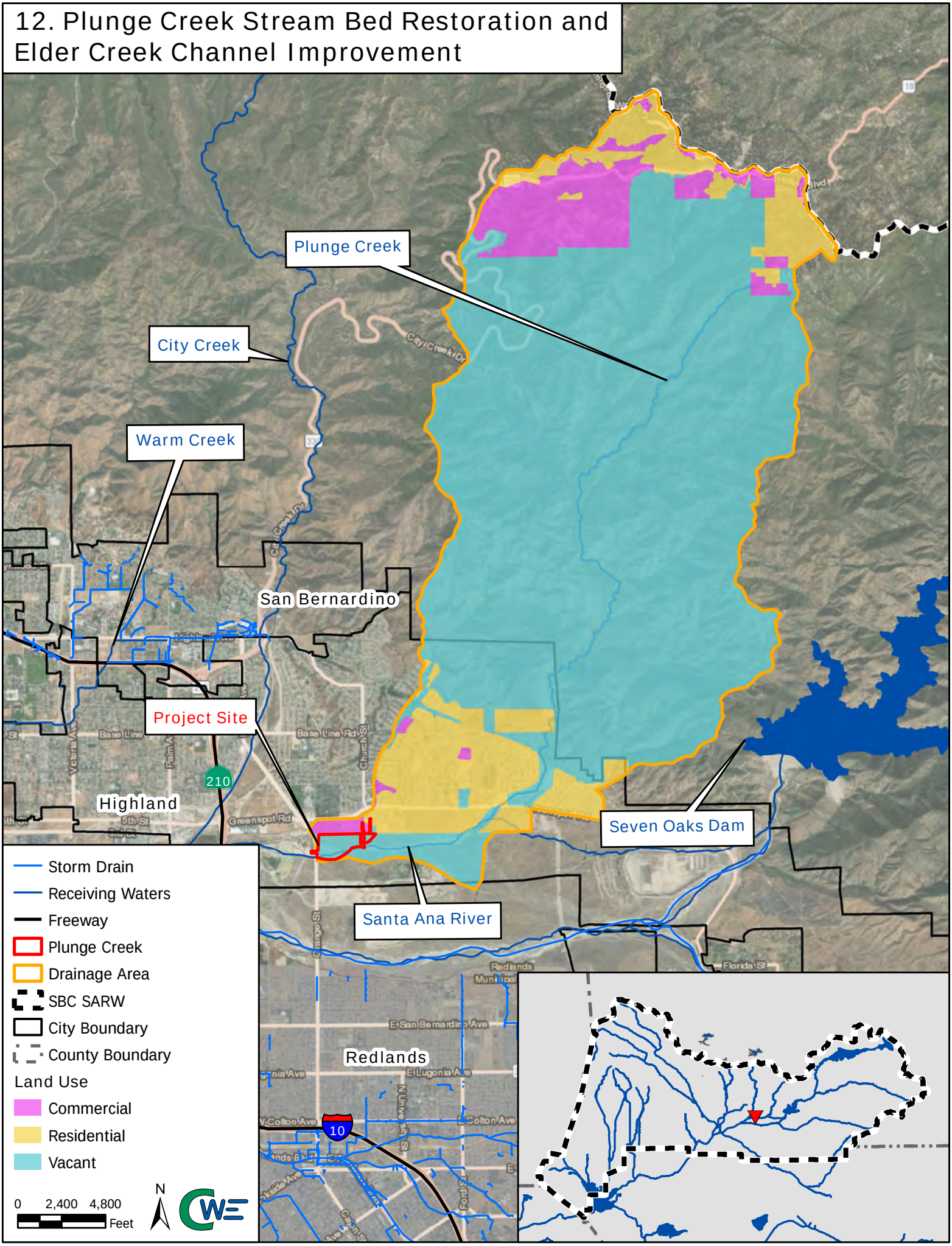
10. Rialto Channel - Etiwanda to Willow



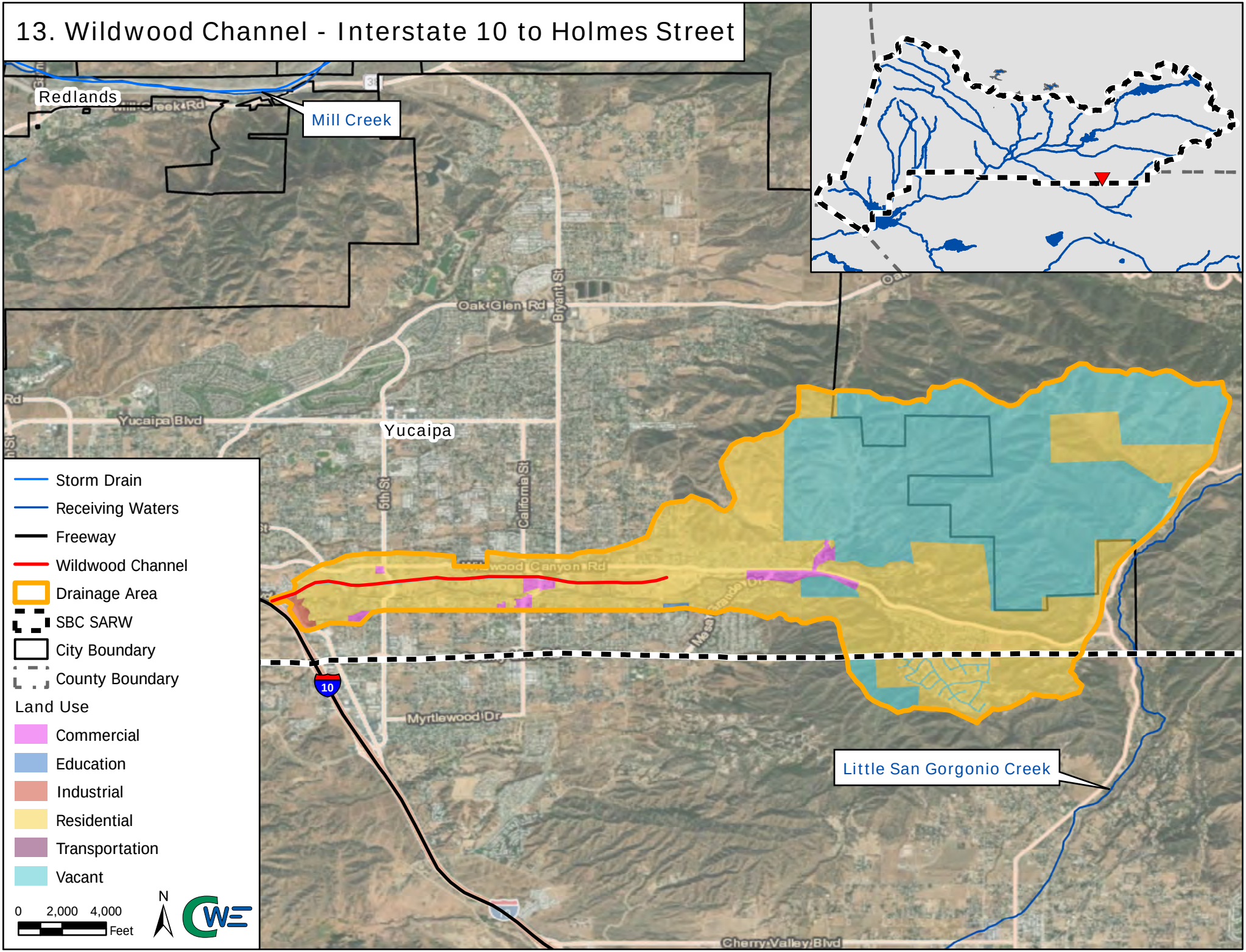
11. Cactus Basins #4 & 5



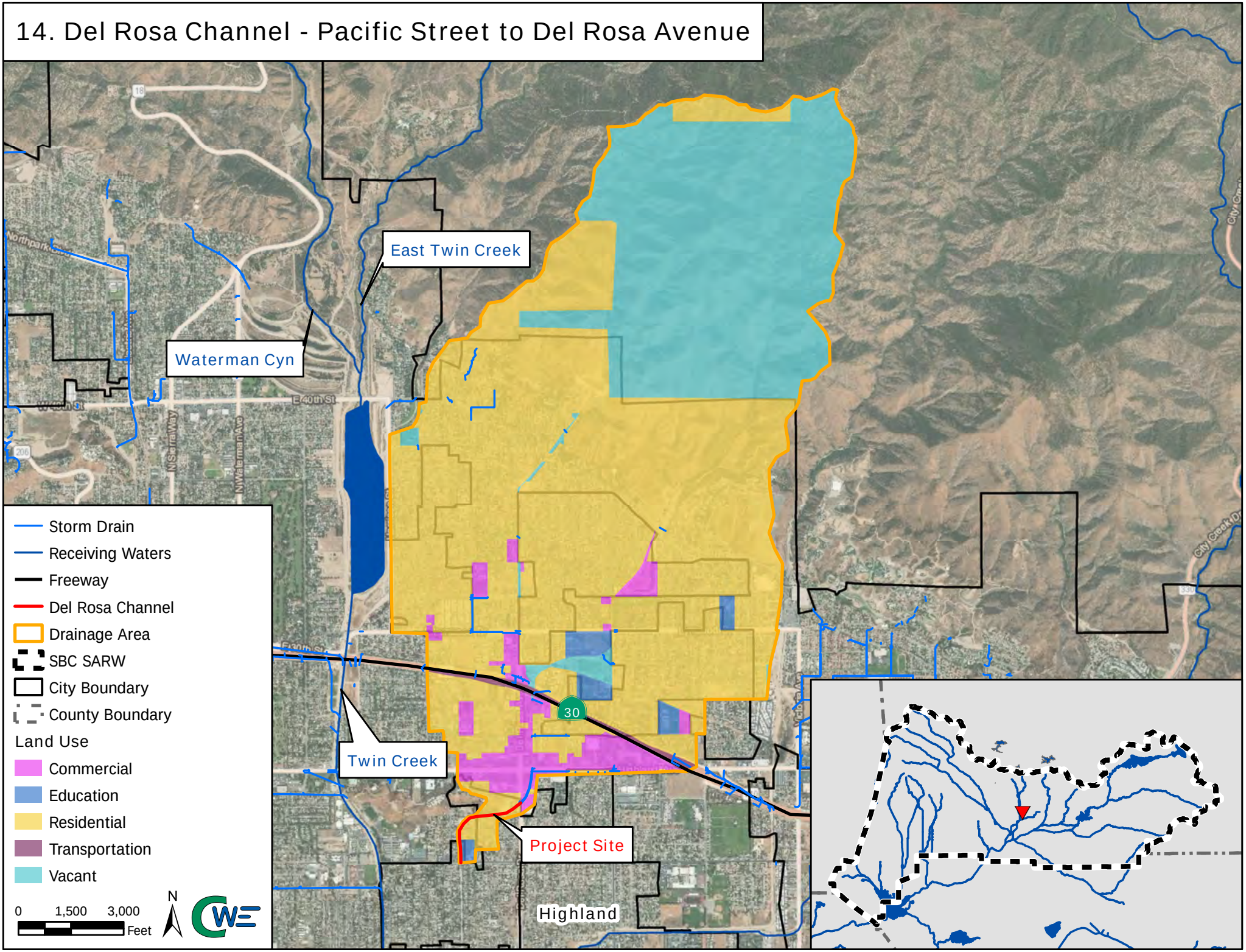
12. Plunge Creek Stream Bed Restoration and Elder Creek Channel Improvement



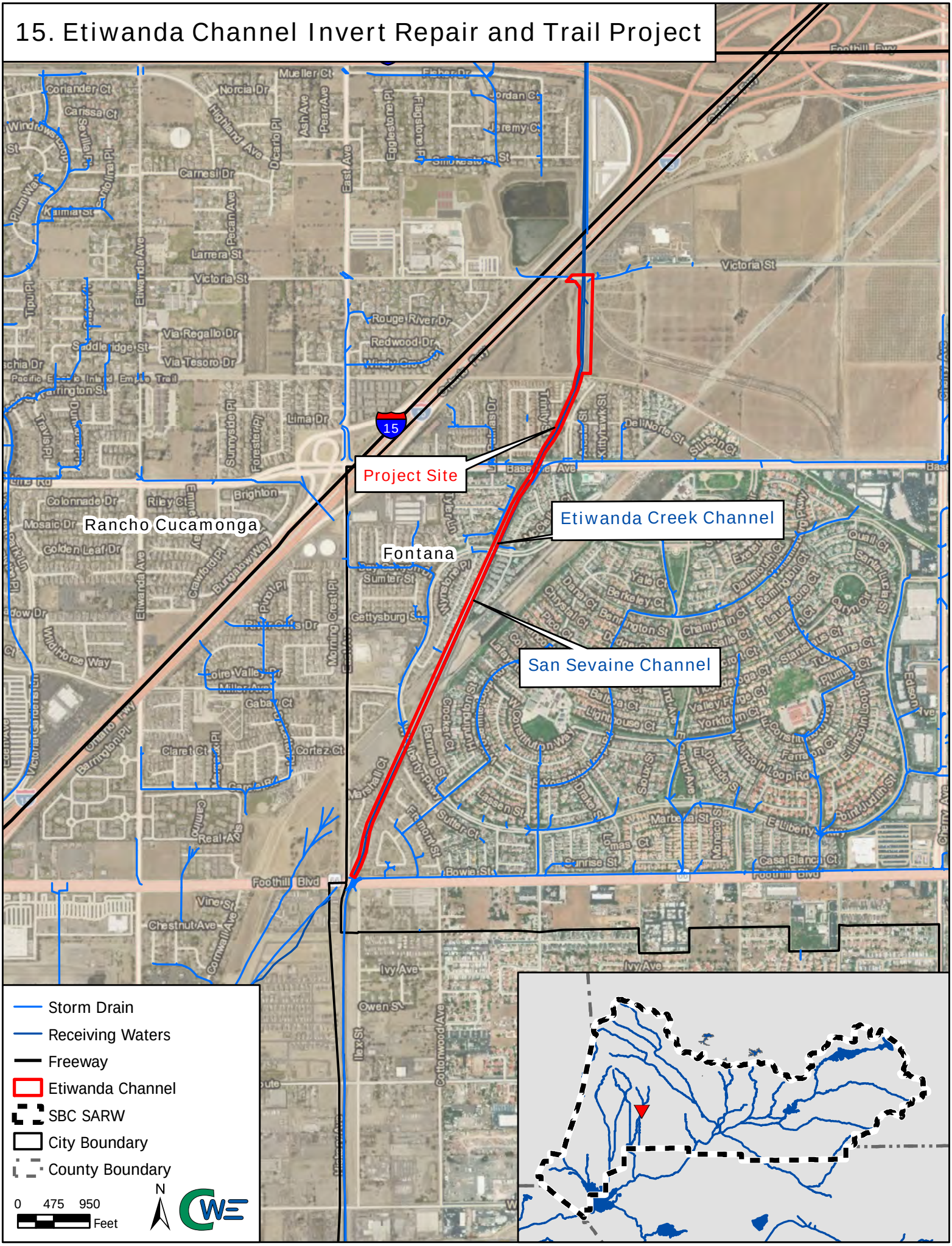
13. Wildwood Channel - Interstate 10 to Holmes Street



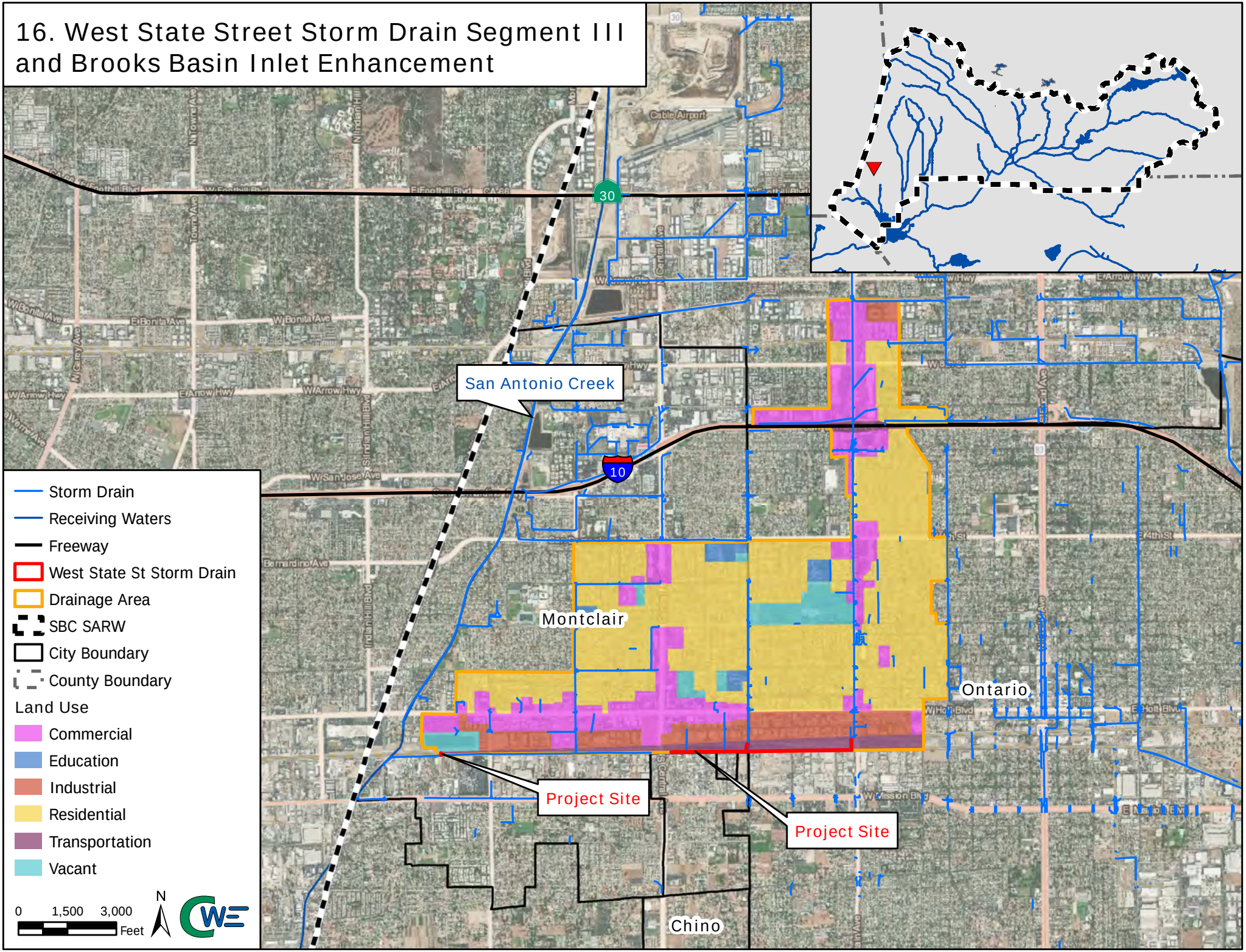
14. Del Rosa Channel - Pacific Street to Del Rosa Avenue

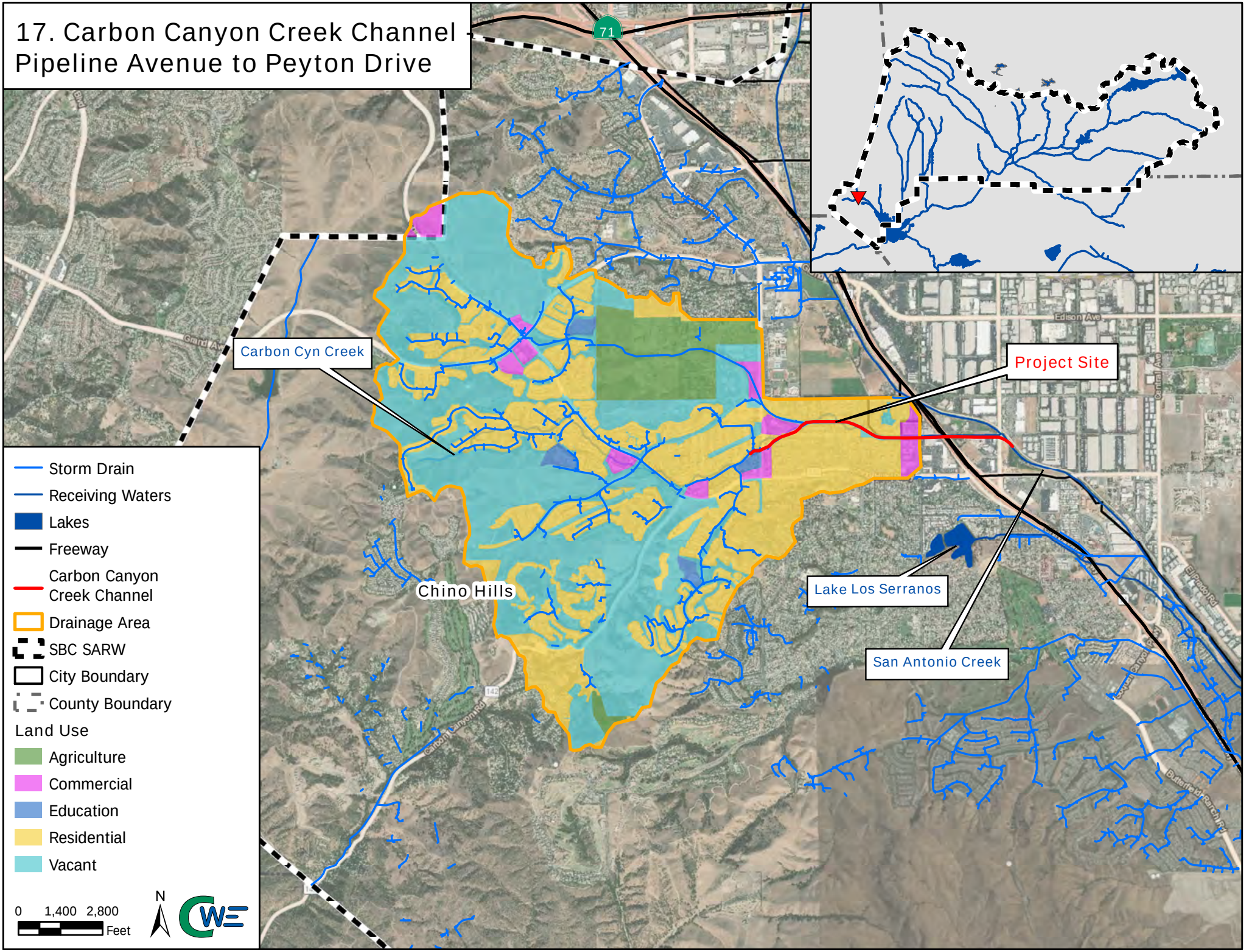


15. Etiwanda Channel Invert Repair and Trail Project

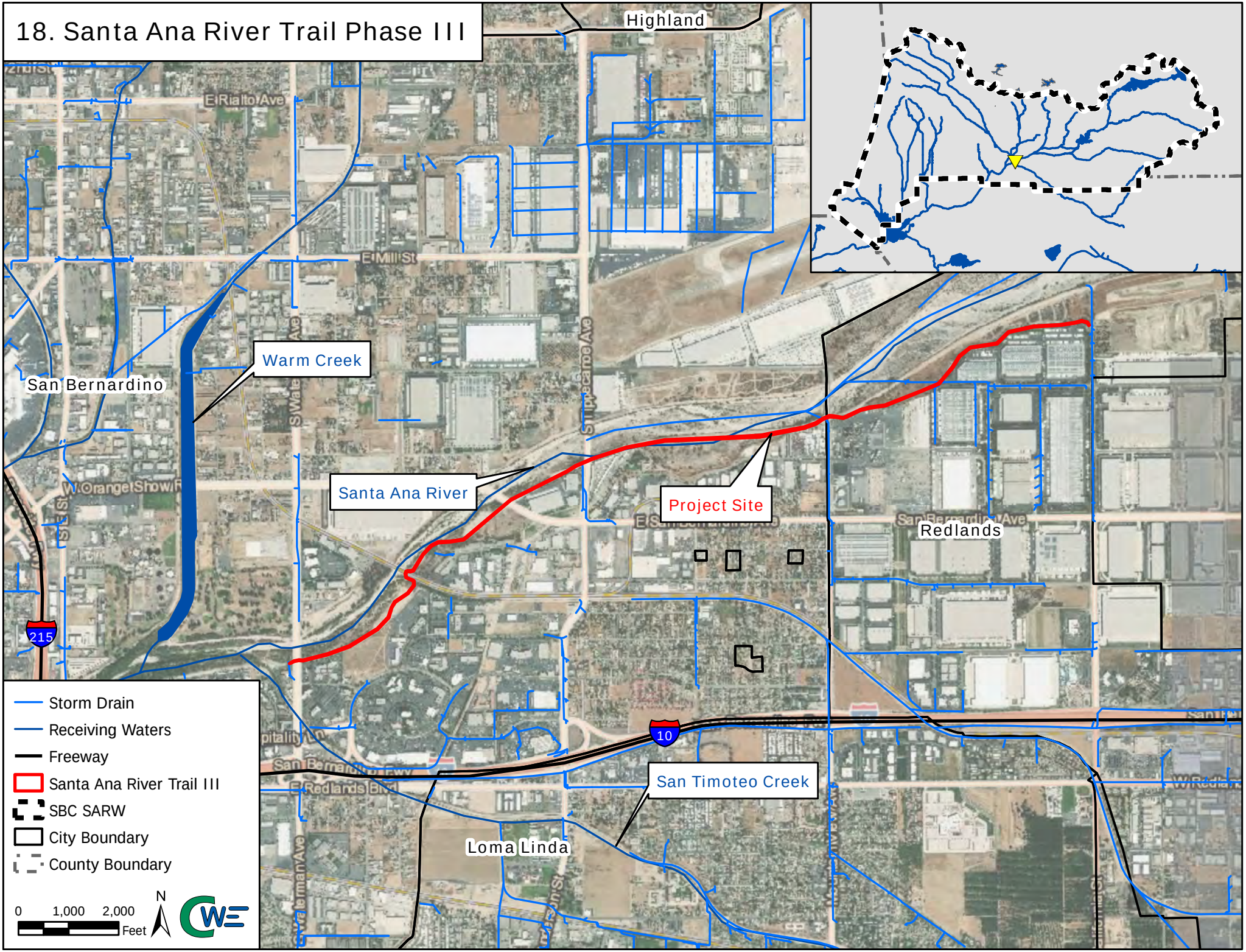


16. West State Street Storm Drain Segment III and Brooks Basin Inlet Enhancement

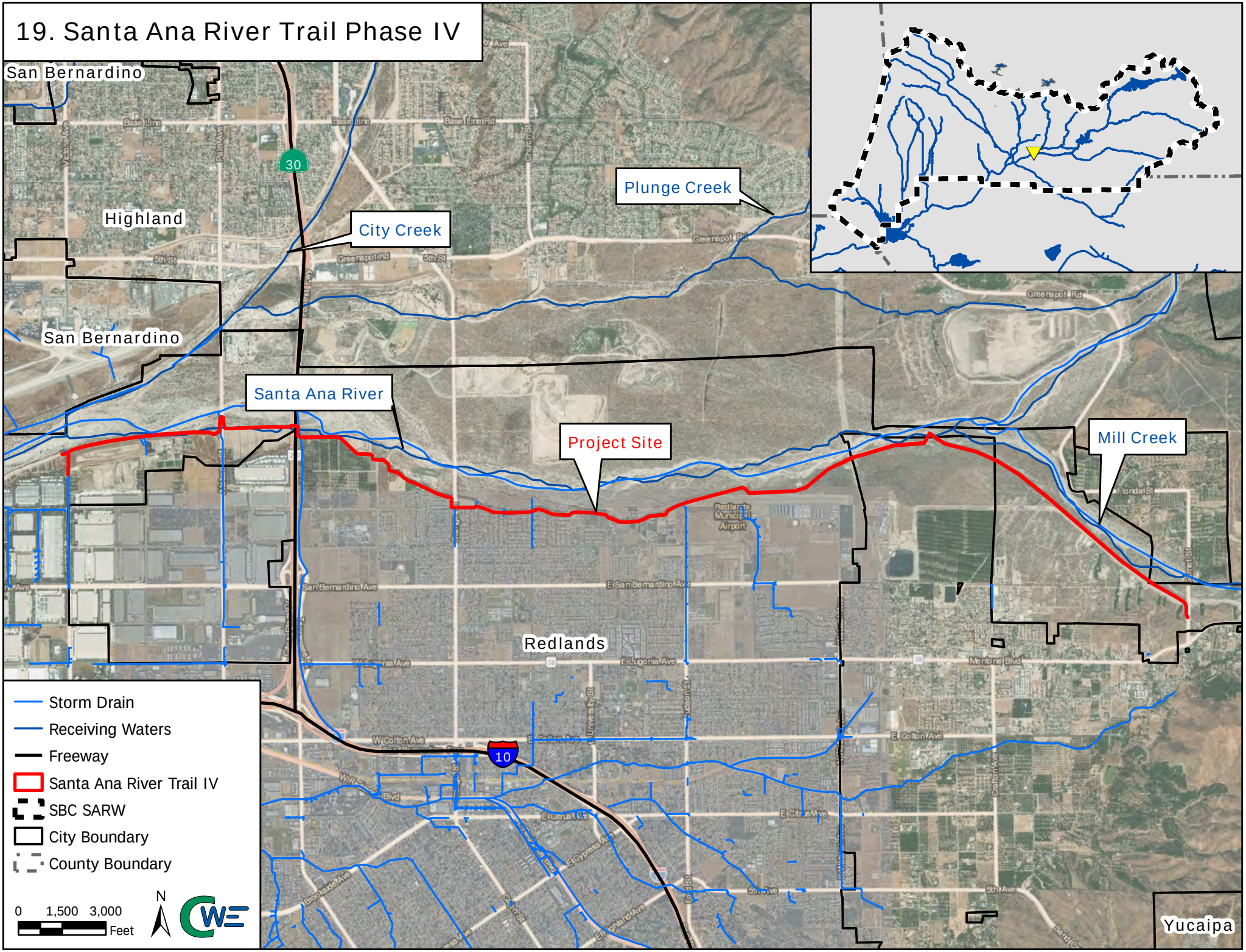



17. Carbon Canyon Creek Channel
Pipeline Avenue to Peyton Drive
Carbon Cyn Creek
Project Site
Chino Hills
Lake Los Serranos
San Antonio Creek
Storm Drain
Receiving Waters
Lakes
Freeway
Carbon Canyon Creek Channel
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Agriculture
Commercial
Education
Residential
Vacant
0 1,400 2,800
Feet
N

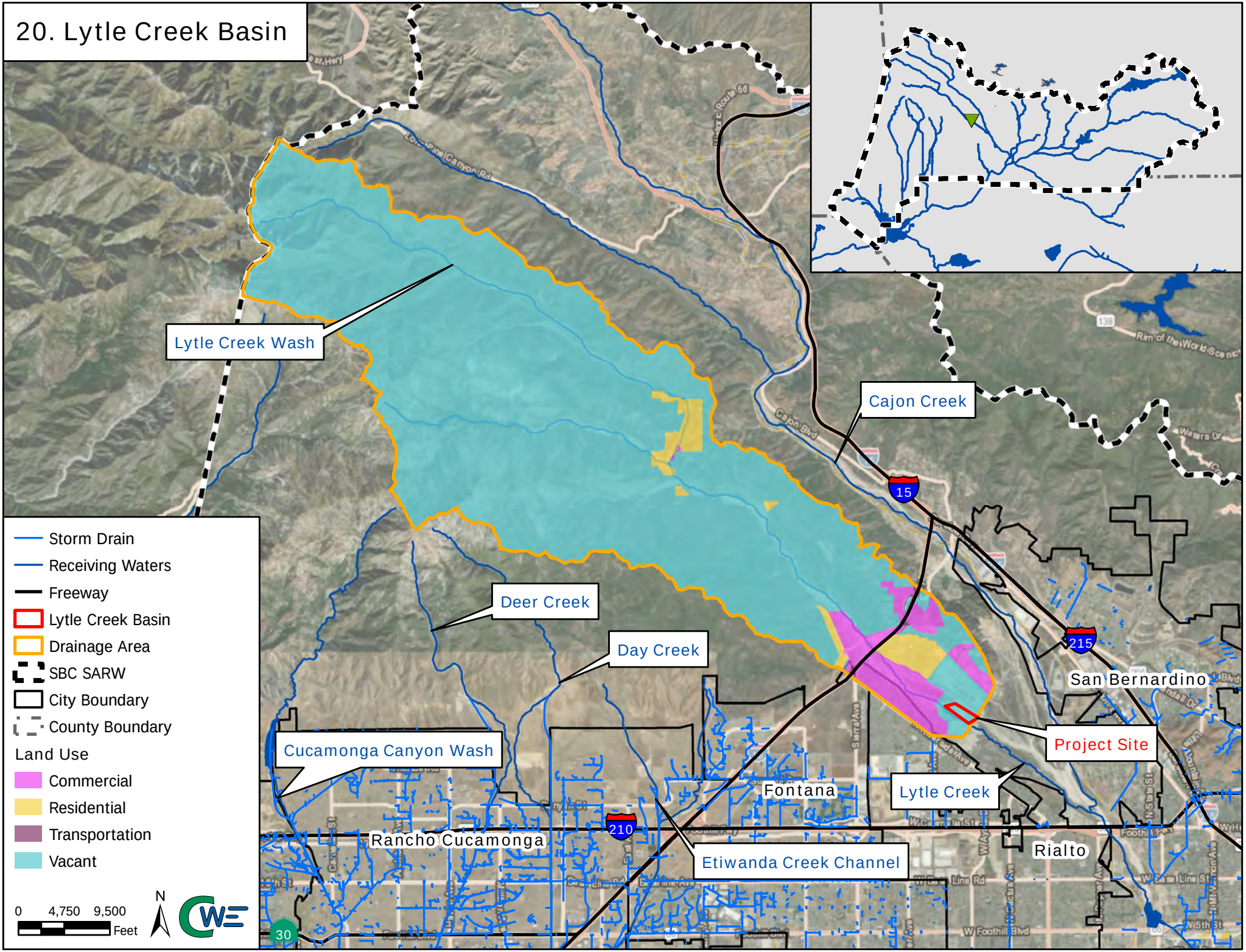
18. Santa Ana River Trail Phase III

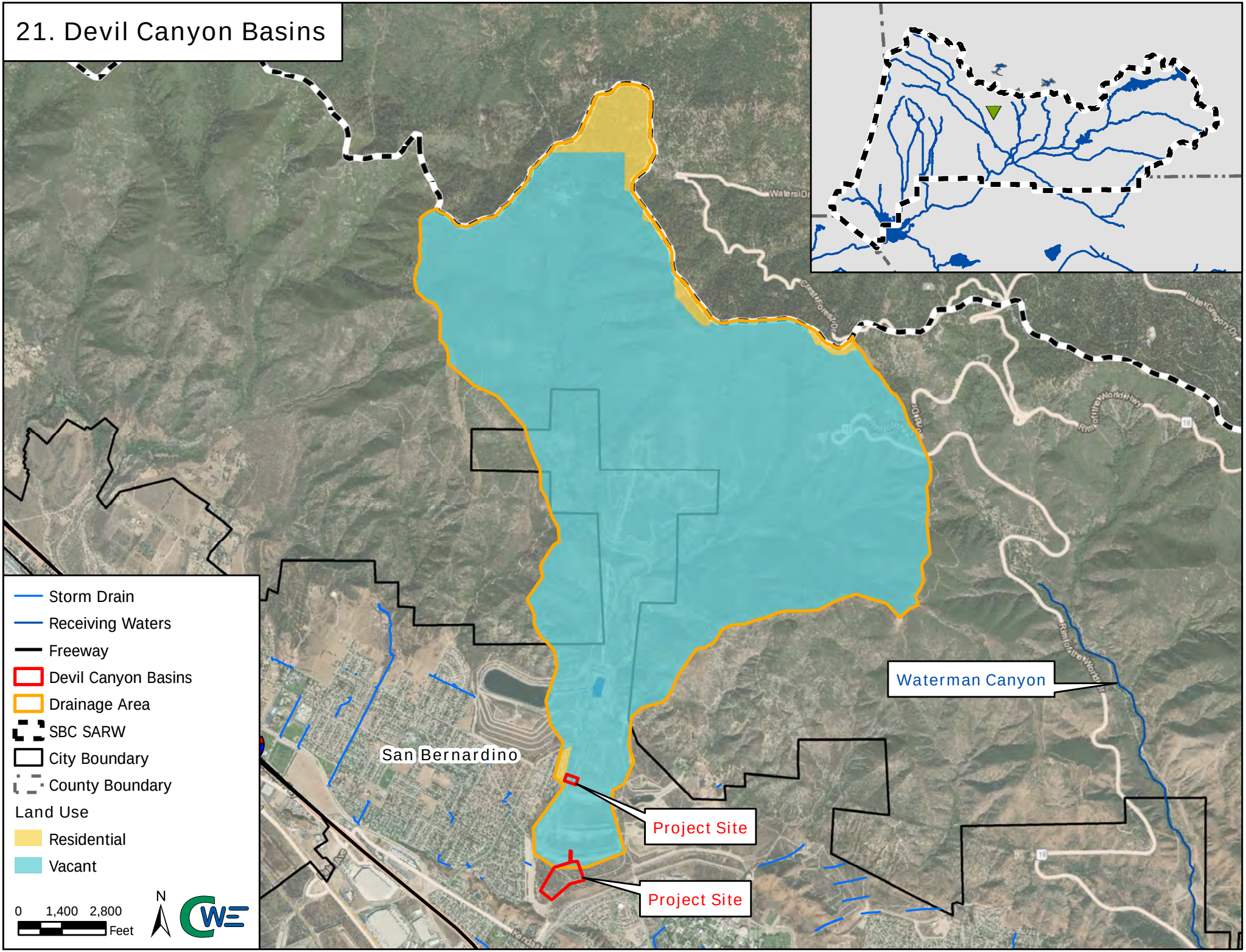


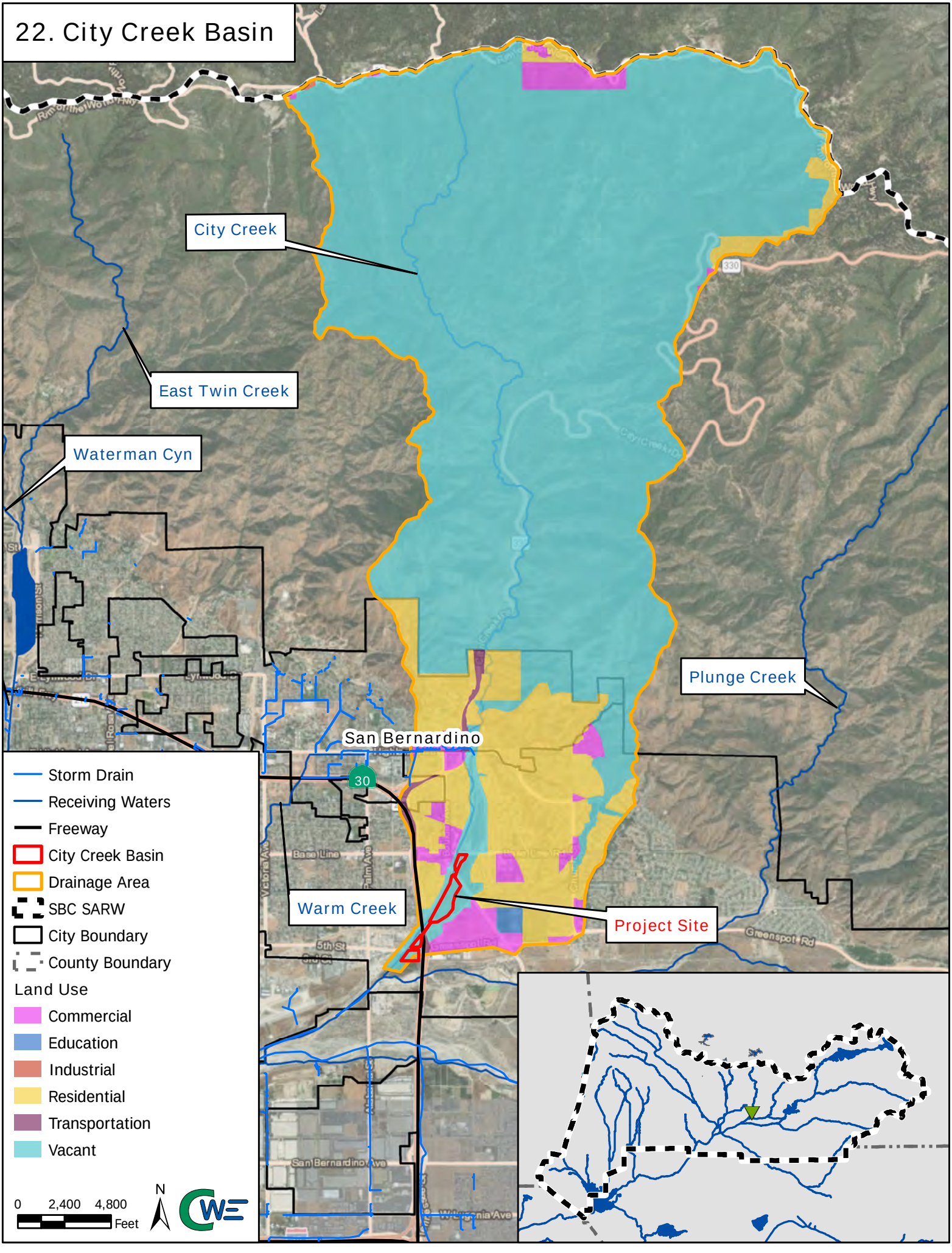
19. Santa Ana River Trail Phase IV



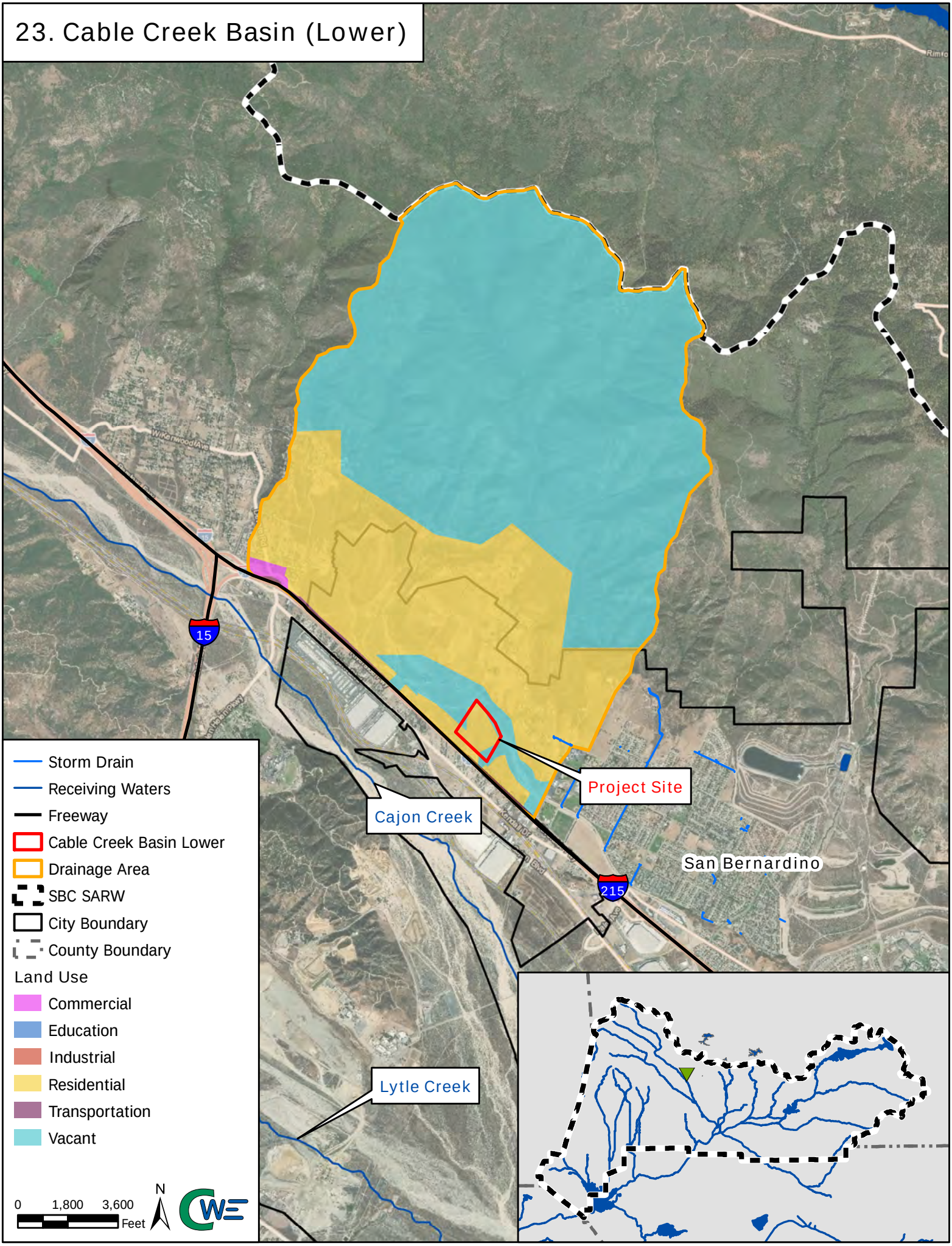
20. Lytle Creek Basin

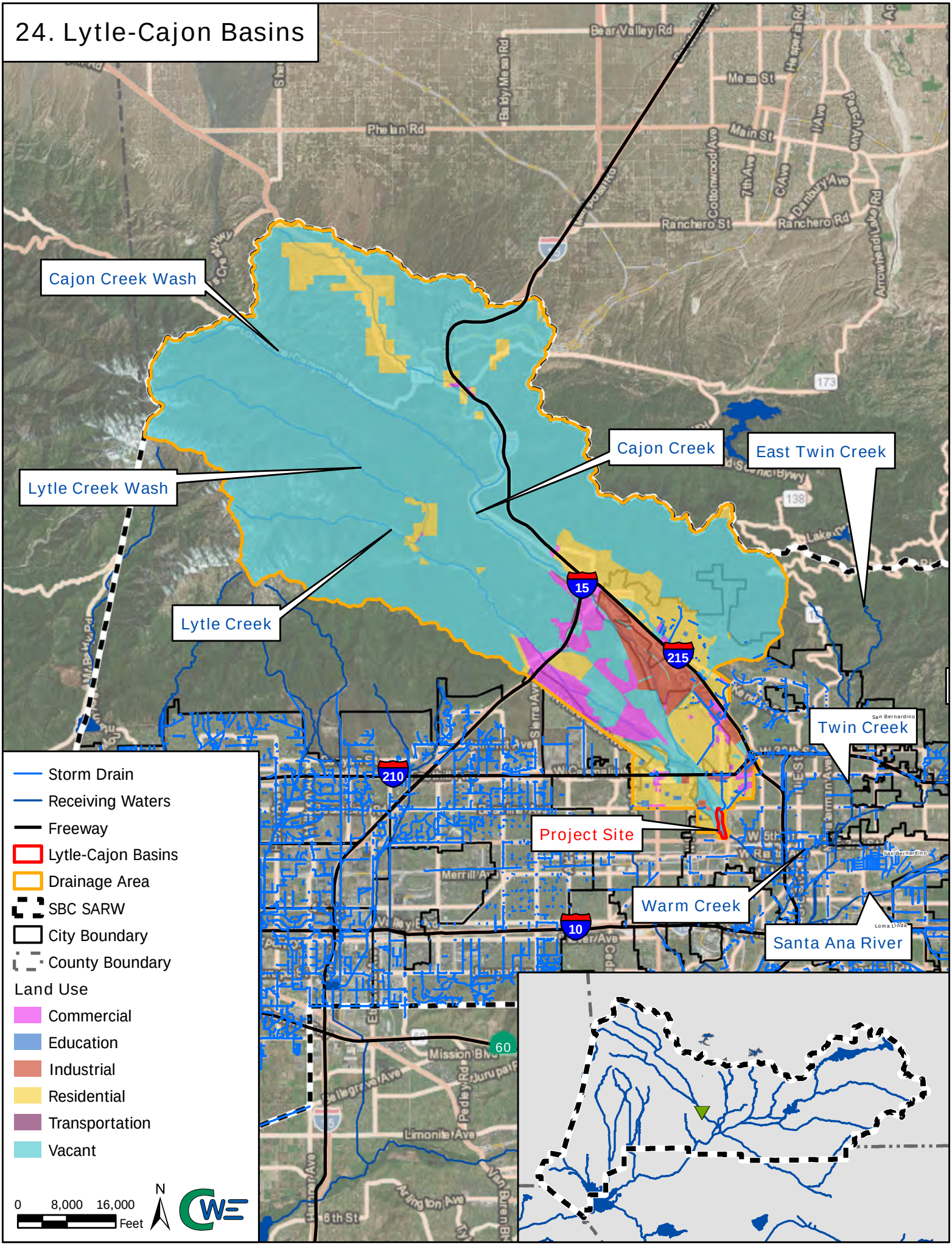


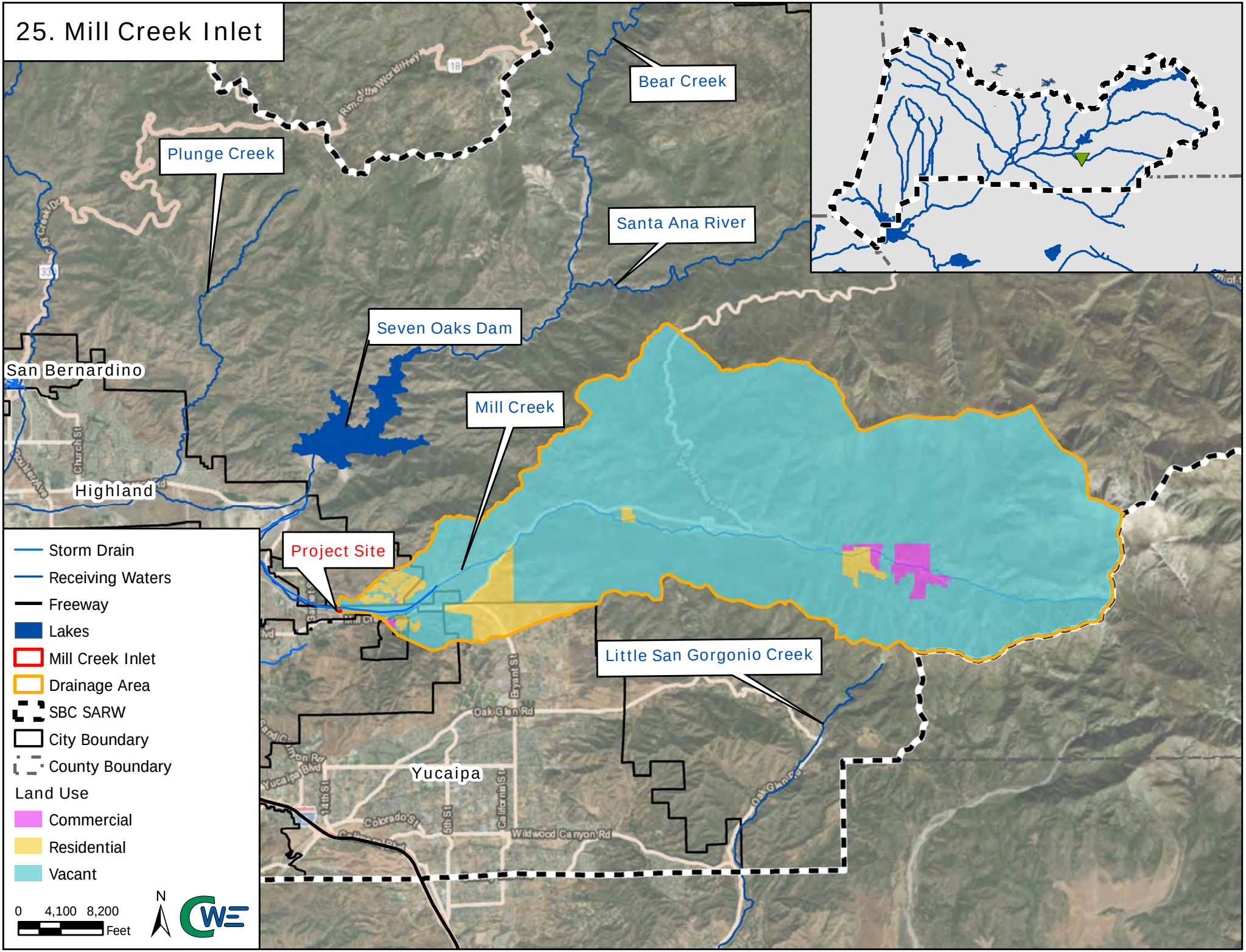

21. Devil Canyon Basins
Storm Drain
Receiving Waters
Freeway
Devil Canyon Basins
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Residential
Vacant
0 1,400 2,800
Feet
N
San Bernardino
Waterman Canyon
Project Site
Project Site

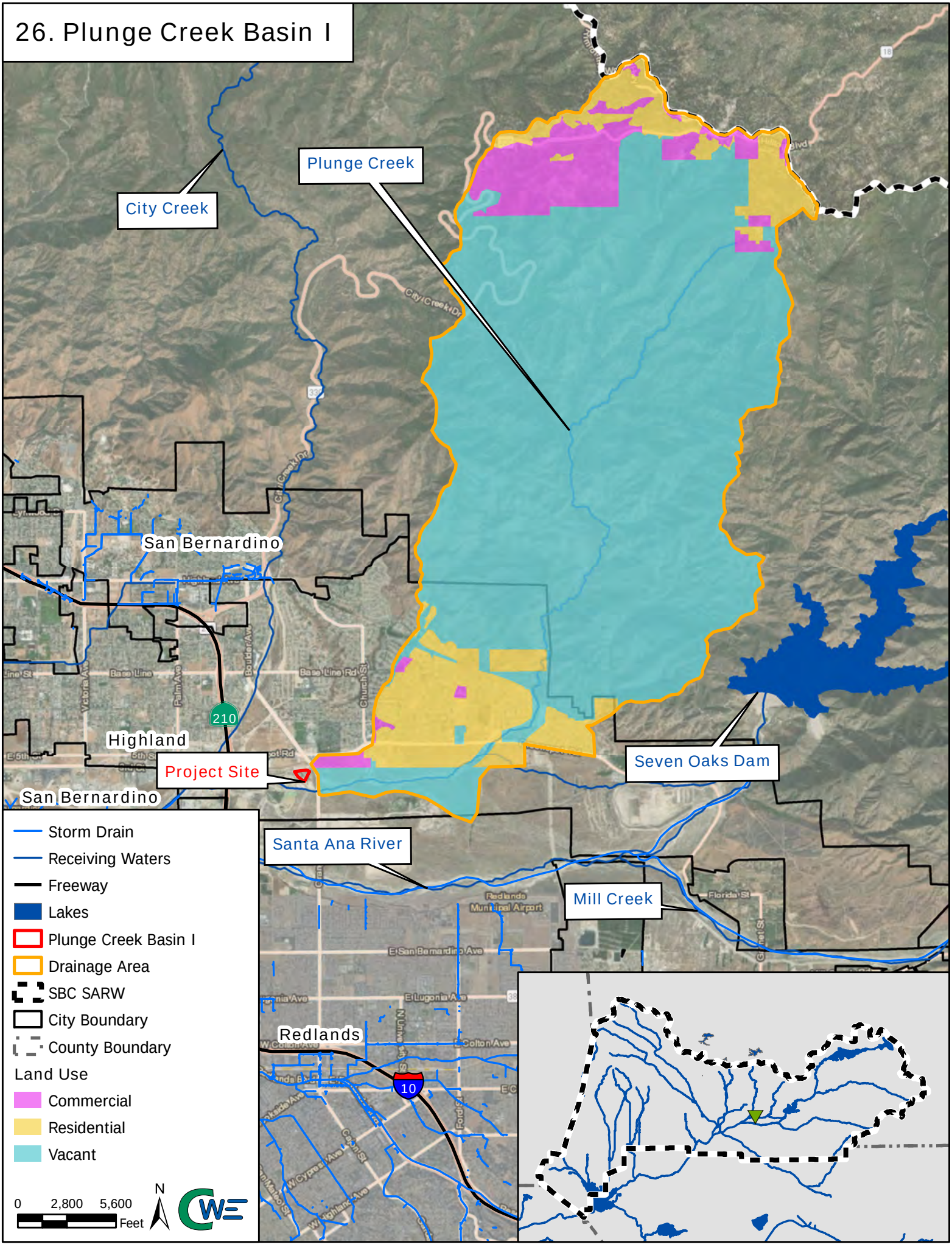

22. City Creek Basin
City Creek
East Twin Creek
Waterman Cyn
Plunge Creek
San Bernardino
Warm Creek
Project Site
Storm Drain
Receiving Waters
Freeway
City Creek Basin
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
2,400
4,800
Feet
N

23. Cable Creek Basin (Lower)

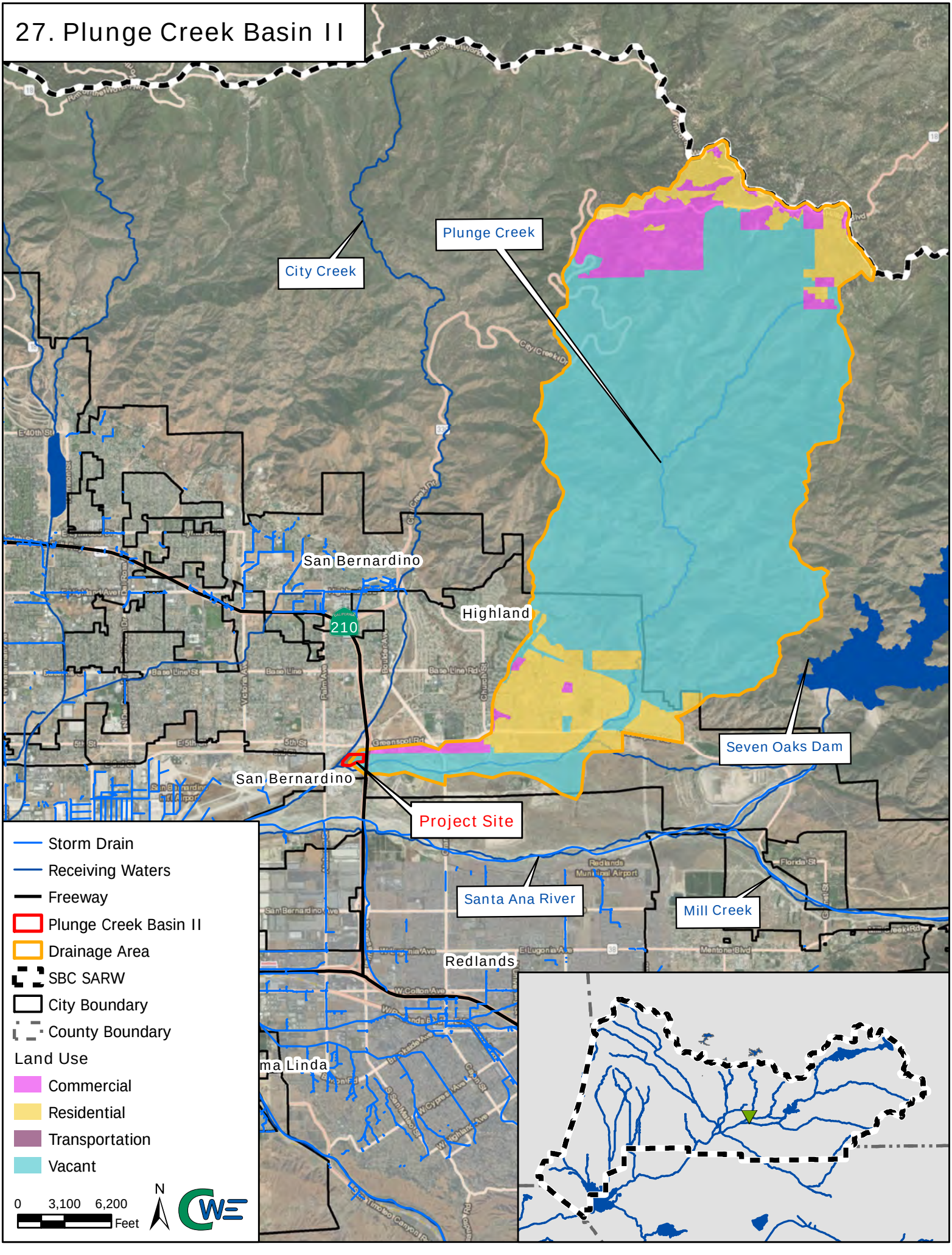



24. Lytle-Cajon Basins
Cajon Creek Wash
Lytle Creek Wash
Lytle Creek
Cajon Creek
East Twin Creek
Twin Creek
Project Site
Warm Creek
Santa Ana River
Storm Drain
Receiving Waters
Freeway
Lytle-Cajon Basins
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0 8,000 16,000
Feet
N

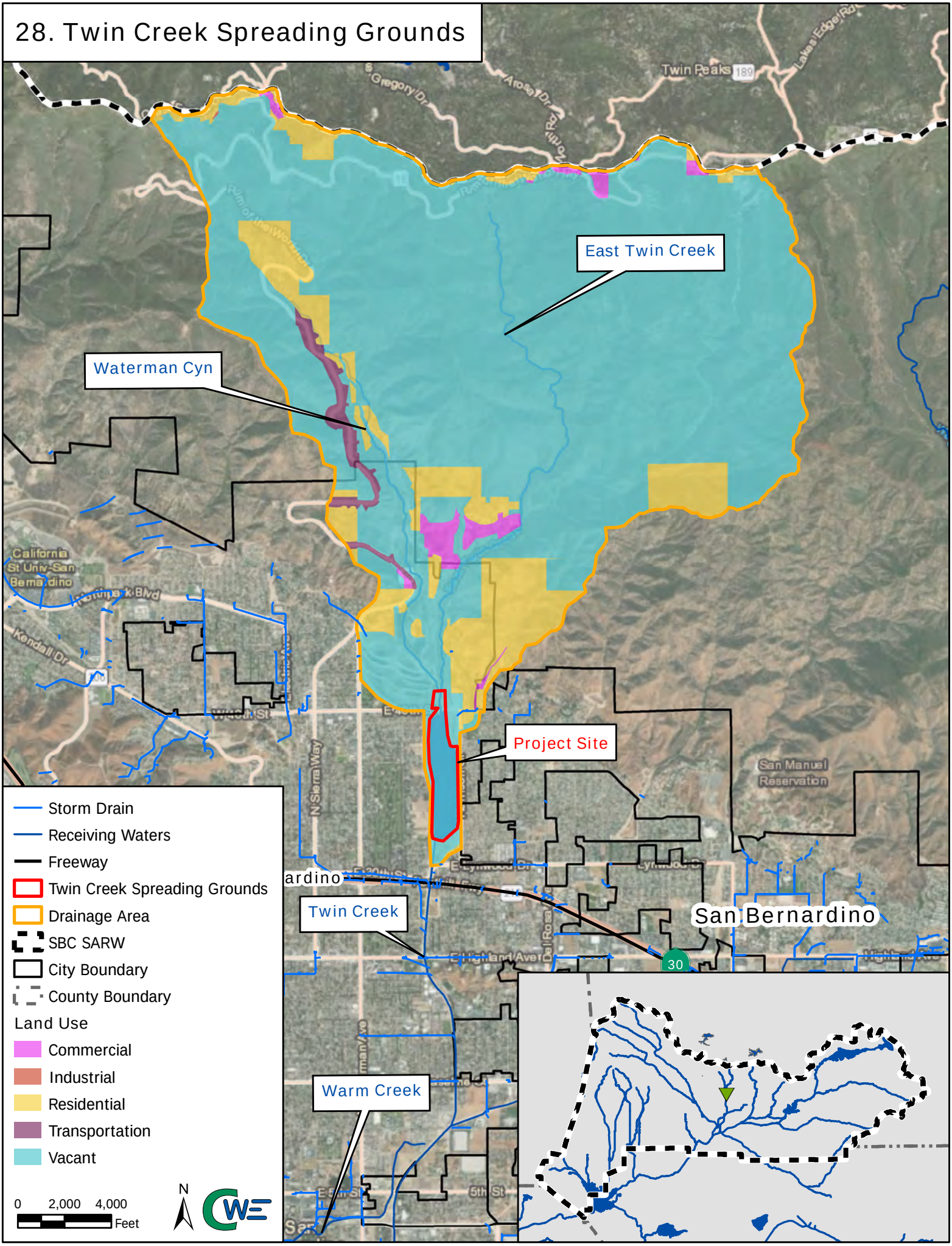

25. Mill Creek Inlet
Bear Creek
Plunge Creek
Santa Ana River
Seven Oaks Dam
San Bernardino
Mill Creek
Highland
Project Site
Little San Gorgonio Creek
Yucaipa
Storm Drain
Receiving Waters
Freeway
Lakes
Mill Creek Inlet
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Residential
Vacant
0 4,100 8,200
Feet
N


26. Plunge Creek Basin I
City Creek
Plunge Creek
San Bernardino
Highland
Project Site
San Bernardino
Seven Oaks Dam
Santa Ana River
Mill Creek
Redlands
Storm Drain
Receiving Waters
Freeway
Lakes
Plunge Creek Basin I
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Residential
Vacant
0
2,800
5,600
Feet
N

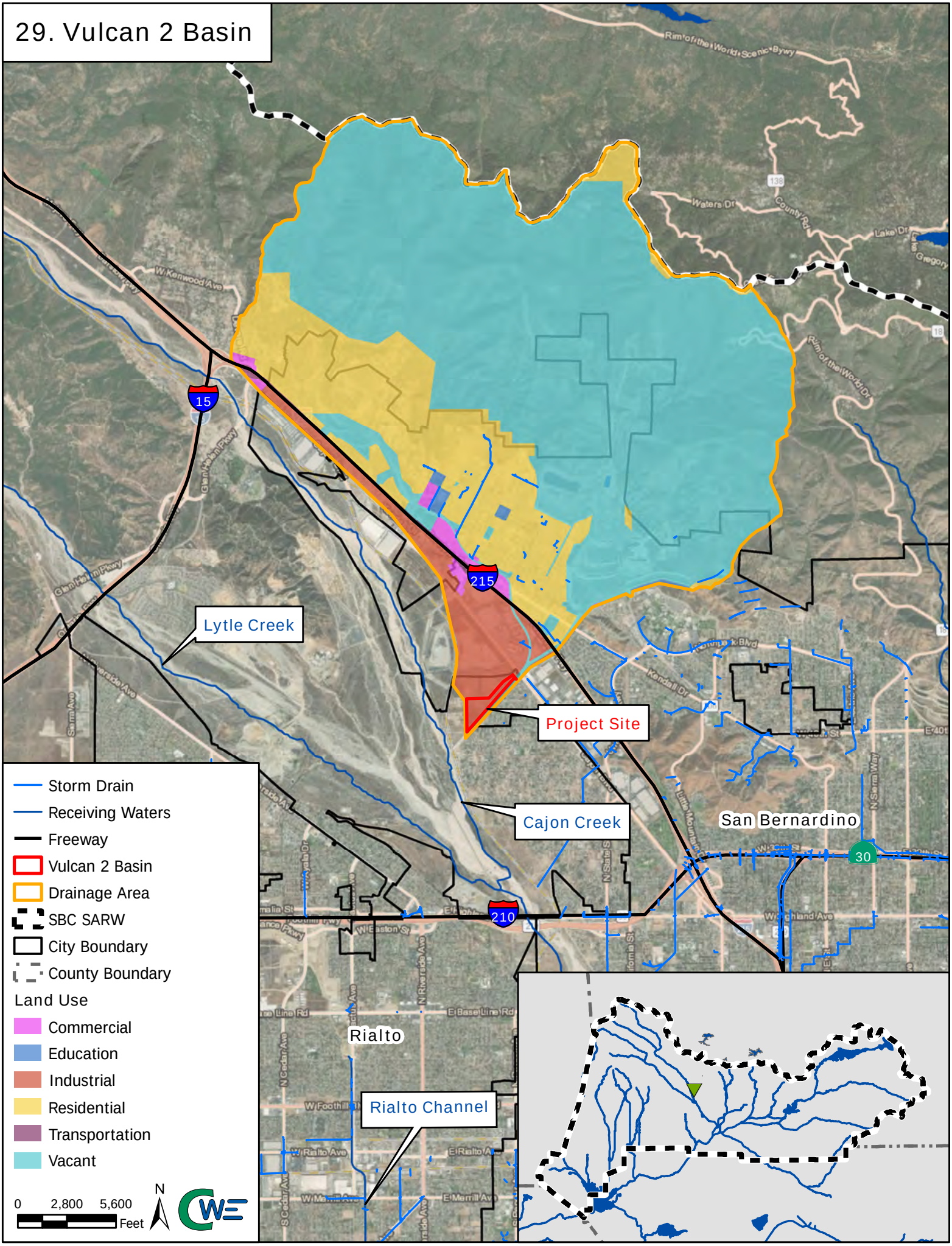
27. Plunge Creek Basin II

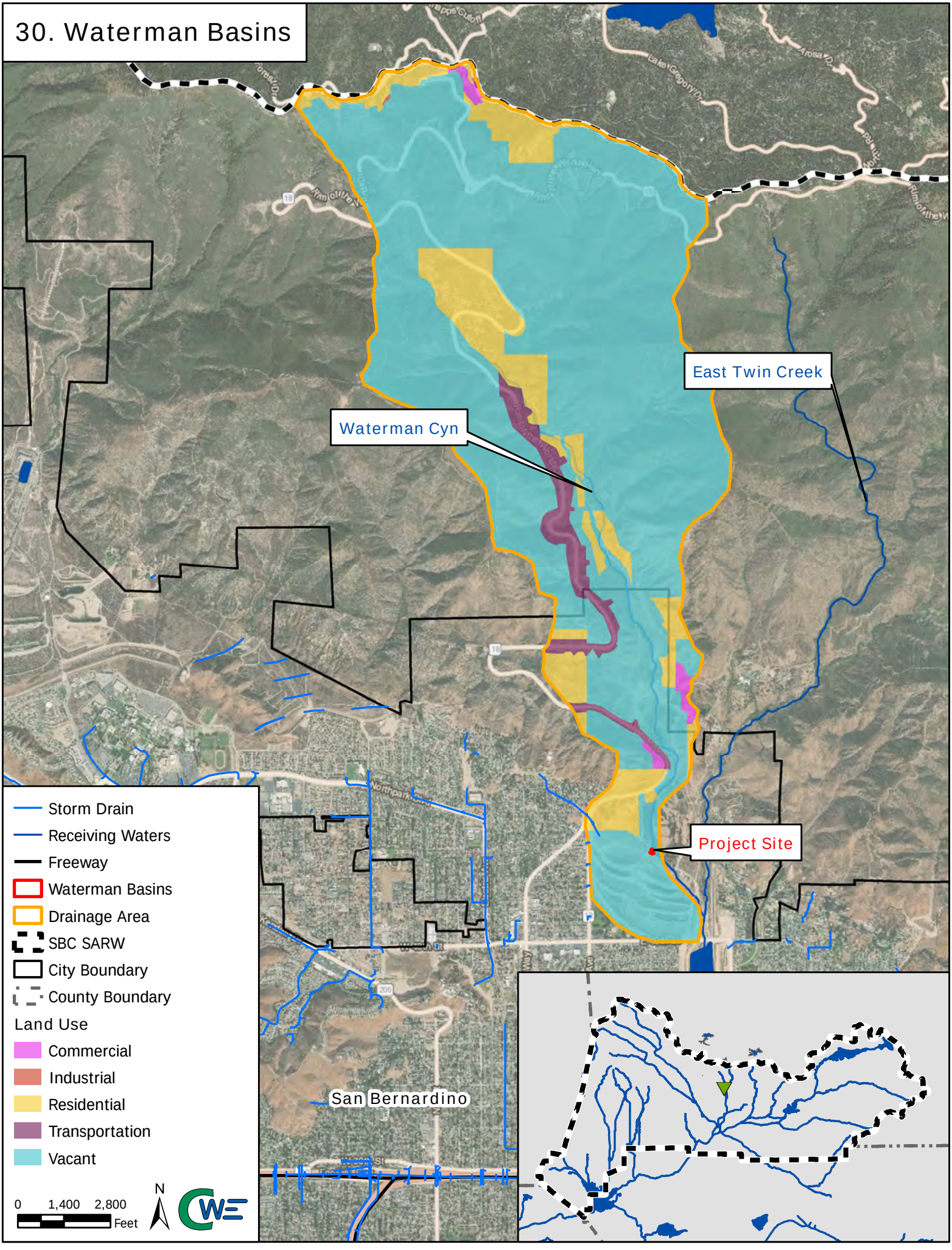


28. Twin Creek Spreading Grounds

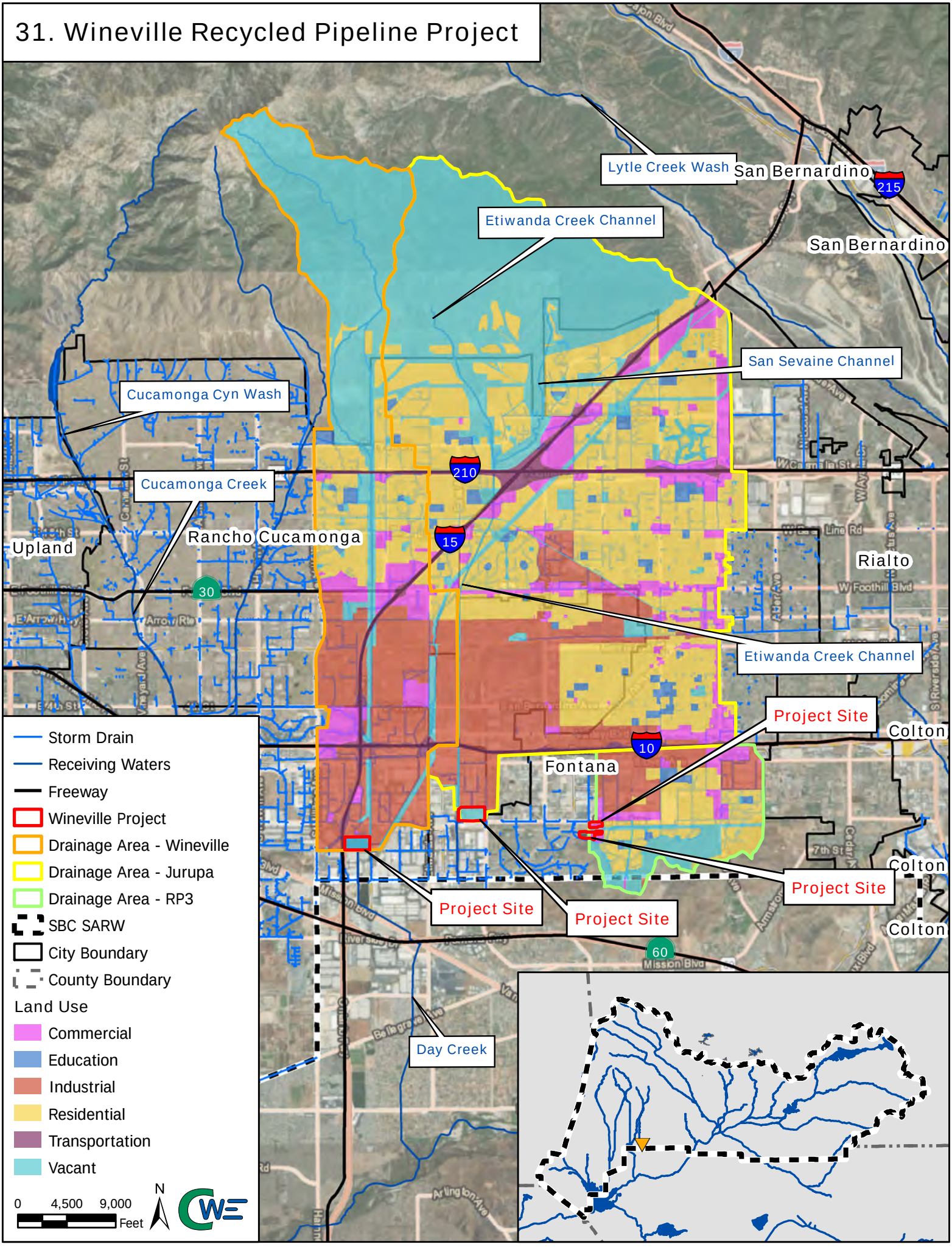


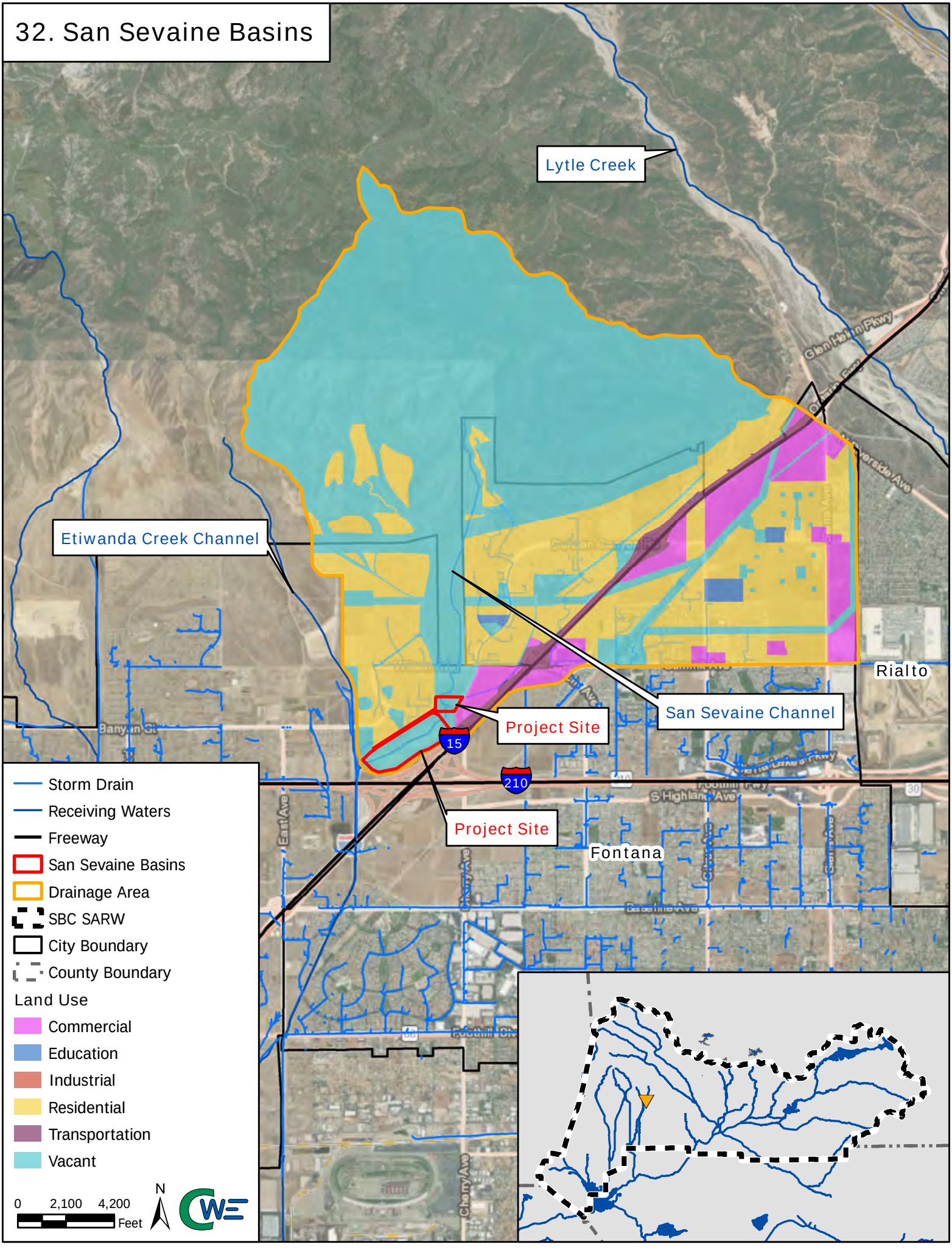
29. Vulcan 2 Basin

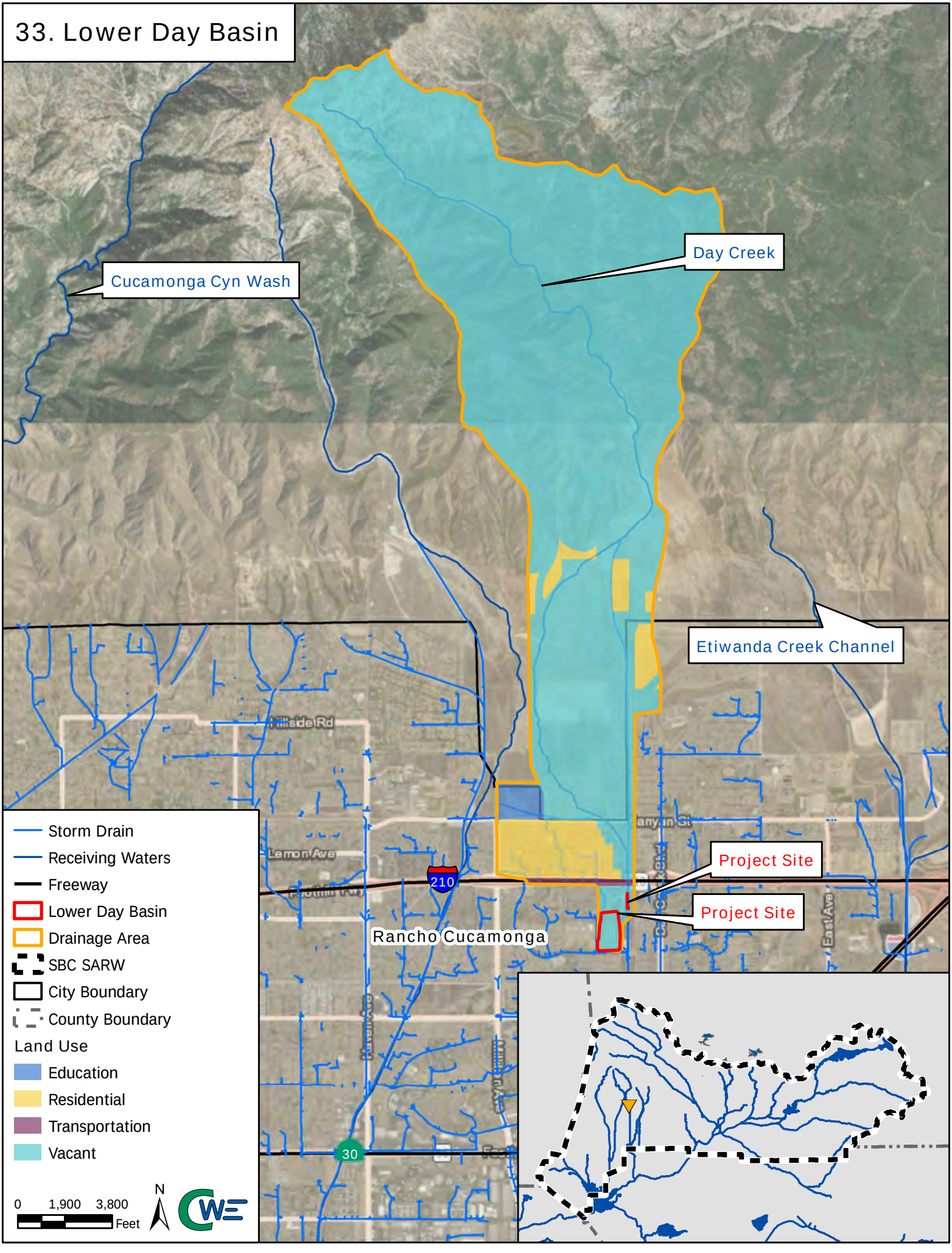


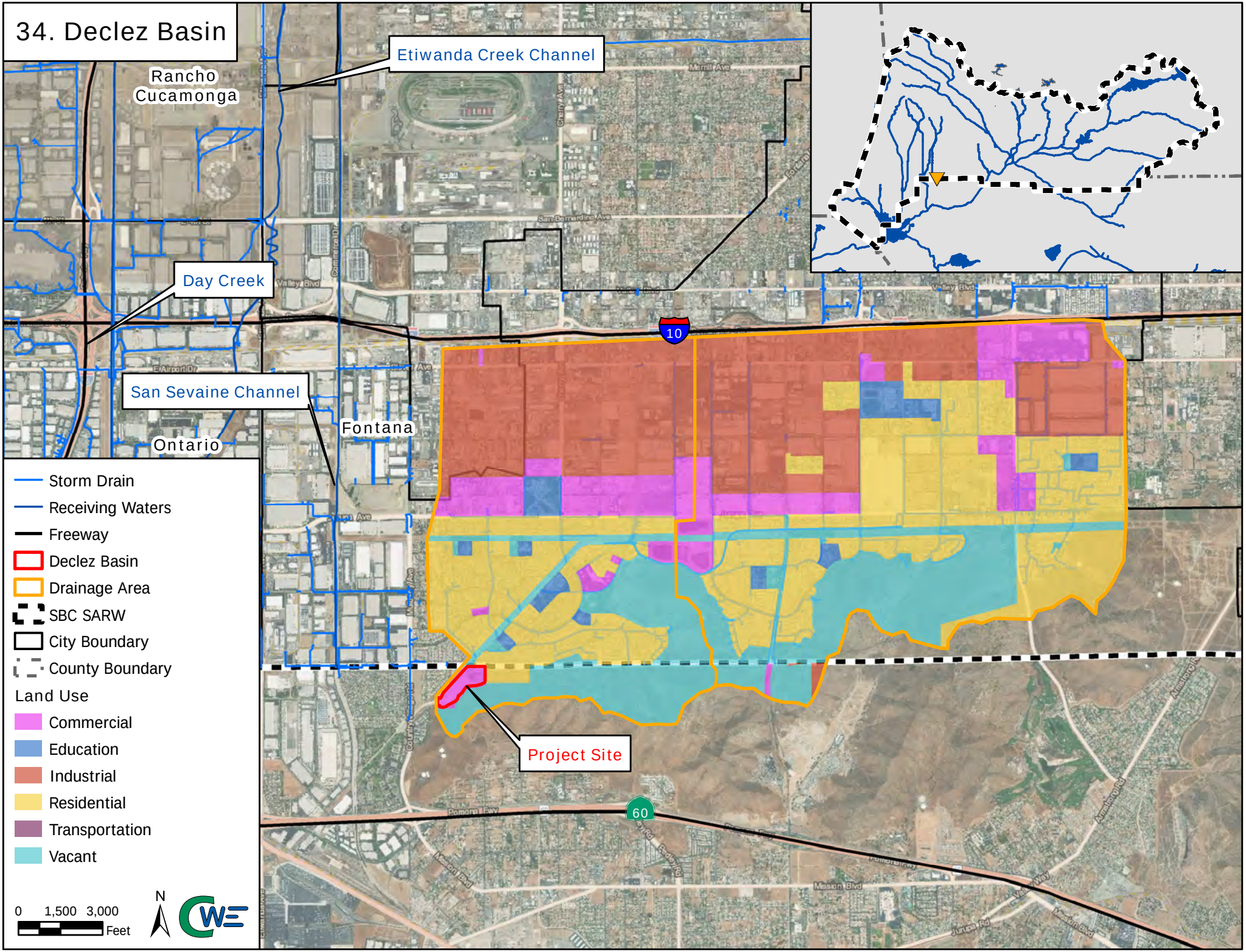

30. Waterman Basins
East Twin Creek
Waterman Cyn
Project Site
San Bernardino
Storm Drain
Receiving Waters
Freeway
Waterman Basins
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Industrial
Residential
Transportation
Vacant
0
1,400
2,800
Feet
N

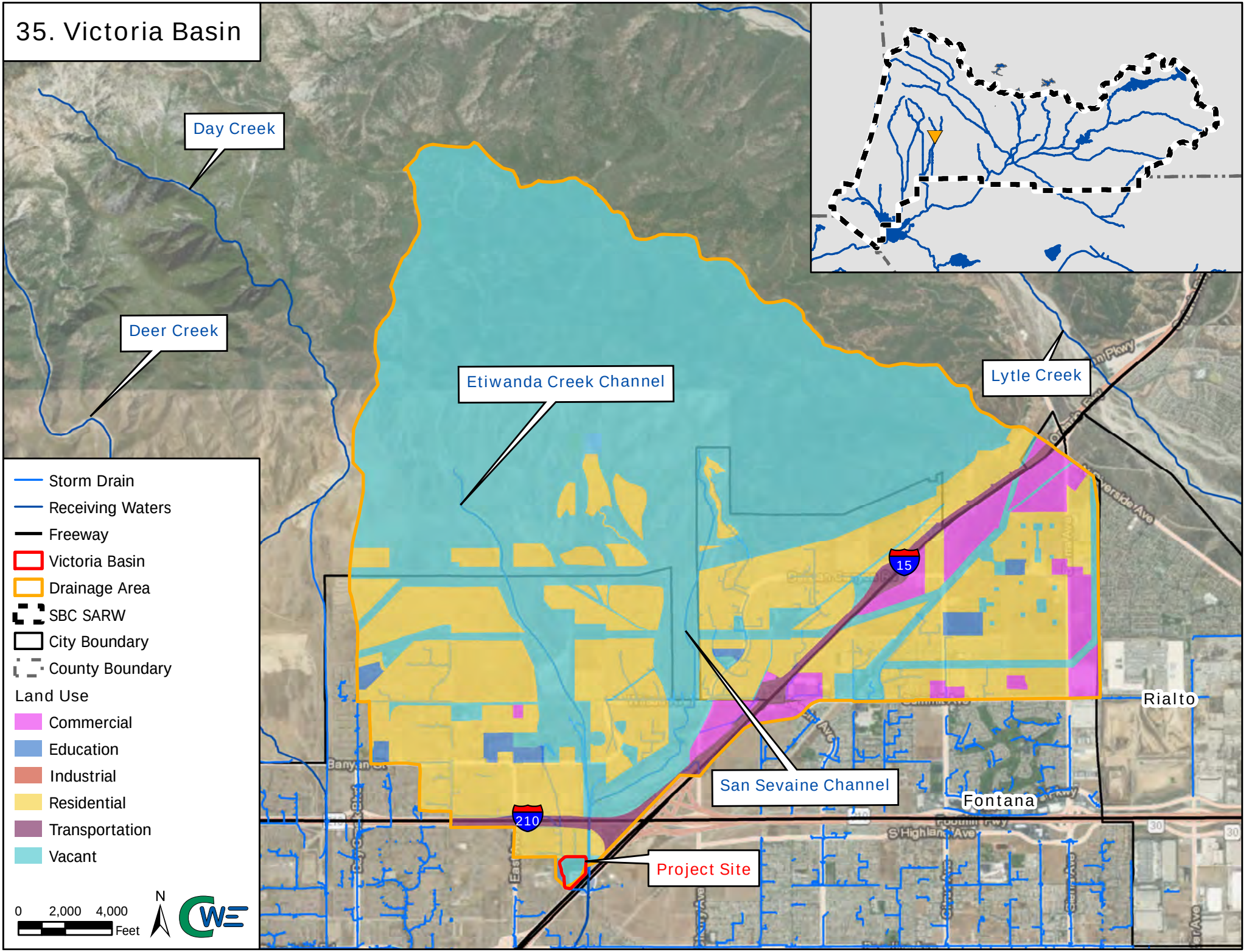
31. Wineville Recycled Pipeline Project

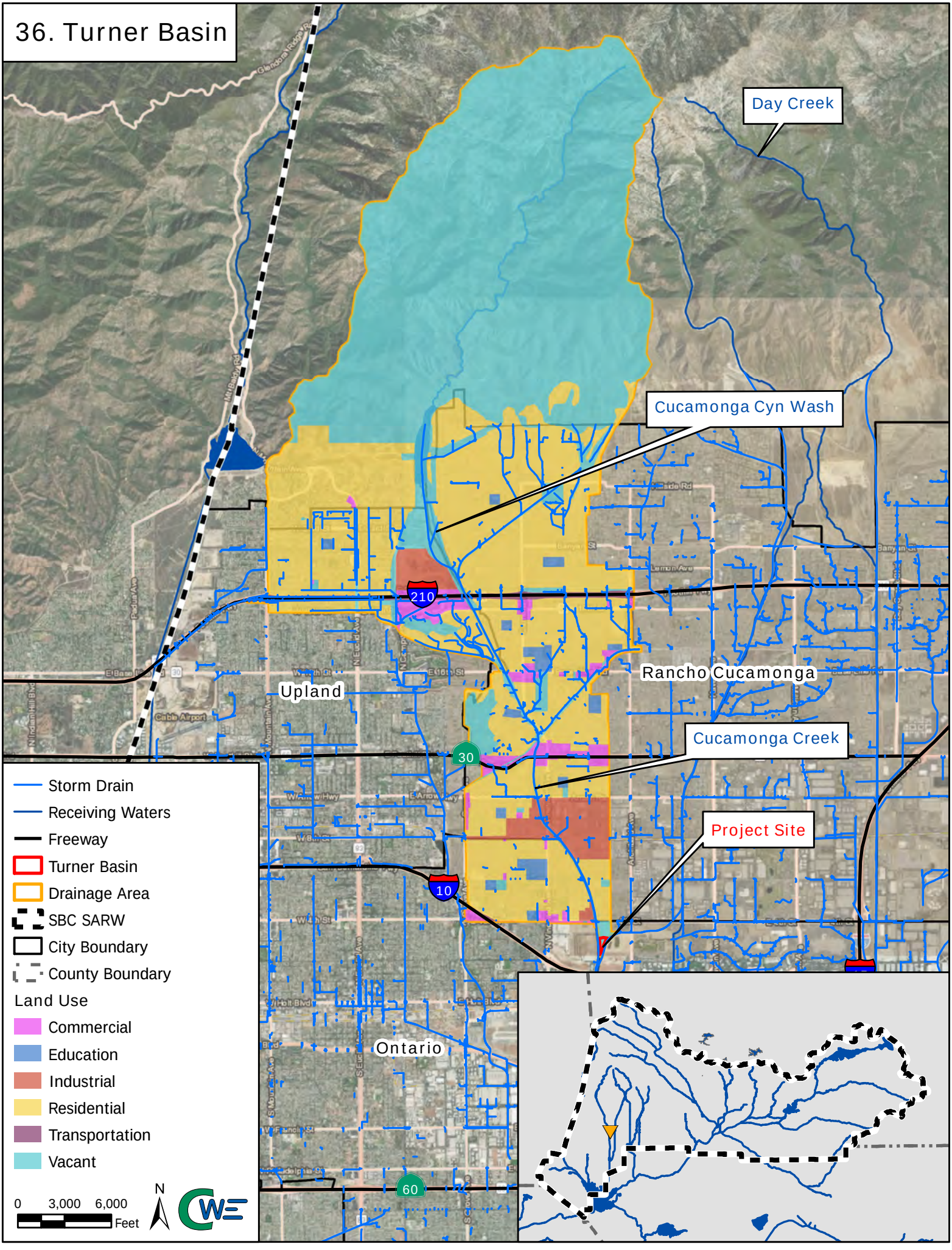


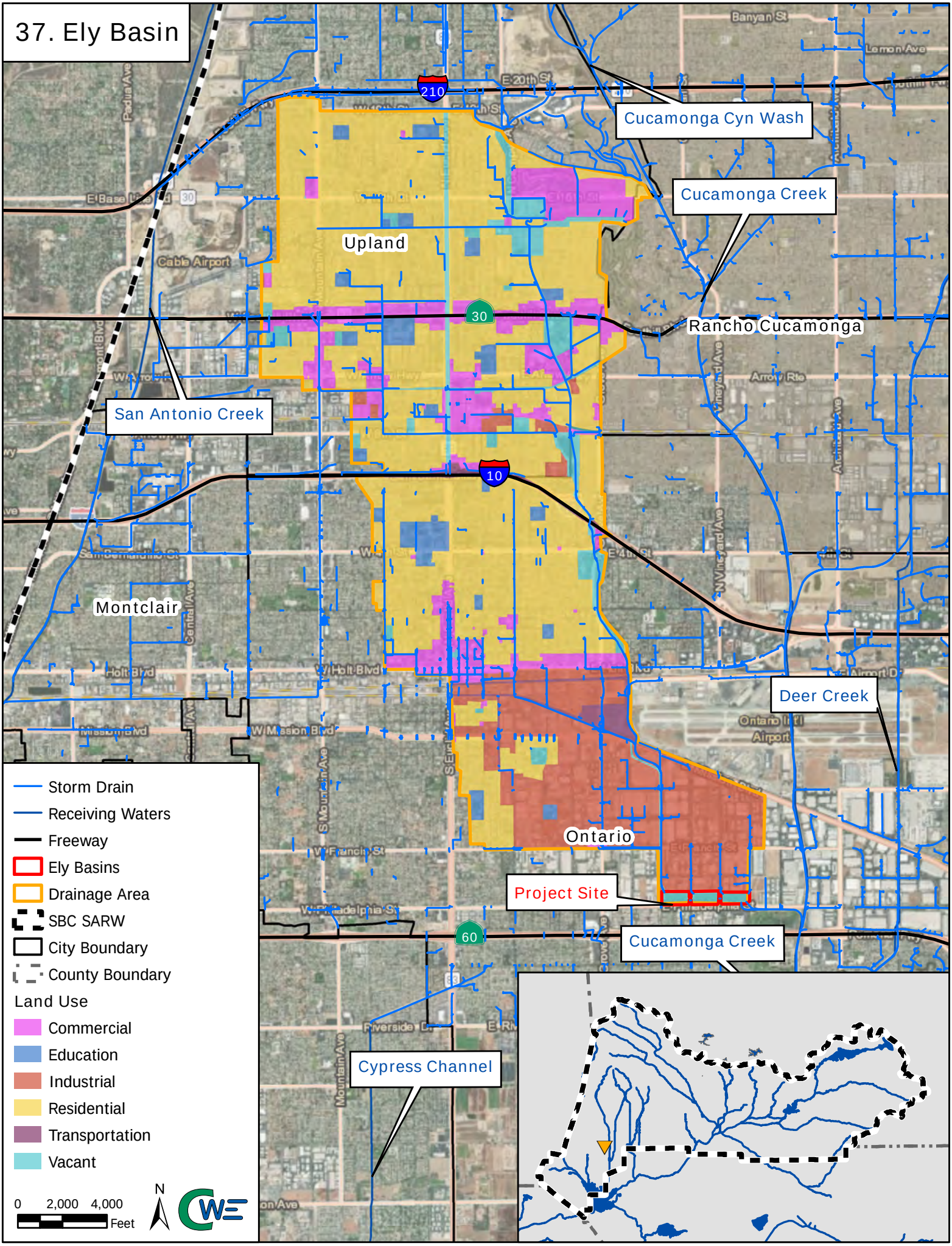

32. San Sevaine Basins
Lytle Creek
Etiwanda Creek Channel
San Sevaine Channel
Project Site
Project Site
Rialto
Fontana
15
210
Storm Drain
Receiving Waters
Freeway
San Sevaine Basins
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
2,100
4,200
Feet
N


33. Lower Day Basin
Cucamonga Cyn Wash
Day Creek
Etiwanda Creek Channel
Project Site
Project Site
Rancho Cucamonga
Lemon Ave
210
30
Storm Drain
Receiving Waters
Freeway
Lower Day Basin
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Education
Residential
Transportation
Vacant
0
1,900
3,800
Feet
N

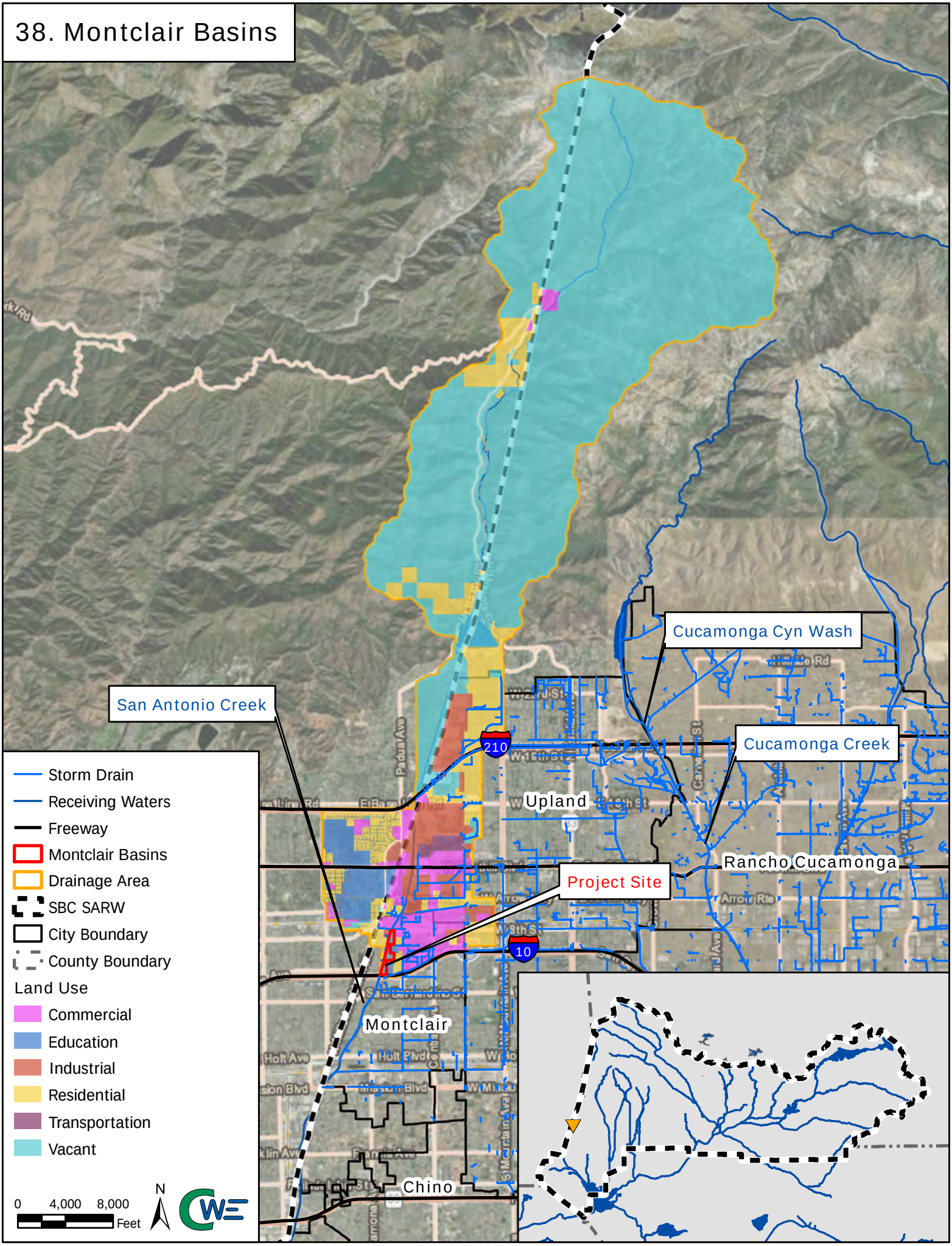

34. Declez Basin
Etiwanda Creek Channel
Rancho Cucamonga
Day Creek
San Sevaine Channel
Fontana
Ontario
10
60
Project Site
Storm Drain
Receiving Waters
Freeway
Declez Basin
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0 1,500 3,000
Feet
N


35. Victoria Basin
Day Creek
Deer Creek
Etiwanda Creek Channel
Lytle Creek
San Sevaine Channel
Project Site
Rialto
Fontana
15
210
Storm Drain
Receiving Waters
Freeway
Victoria Basin
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
2,000
4,000
Feet
N

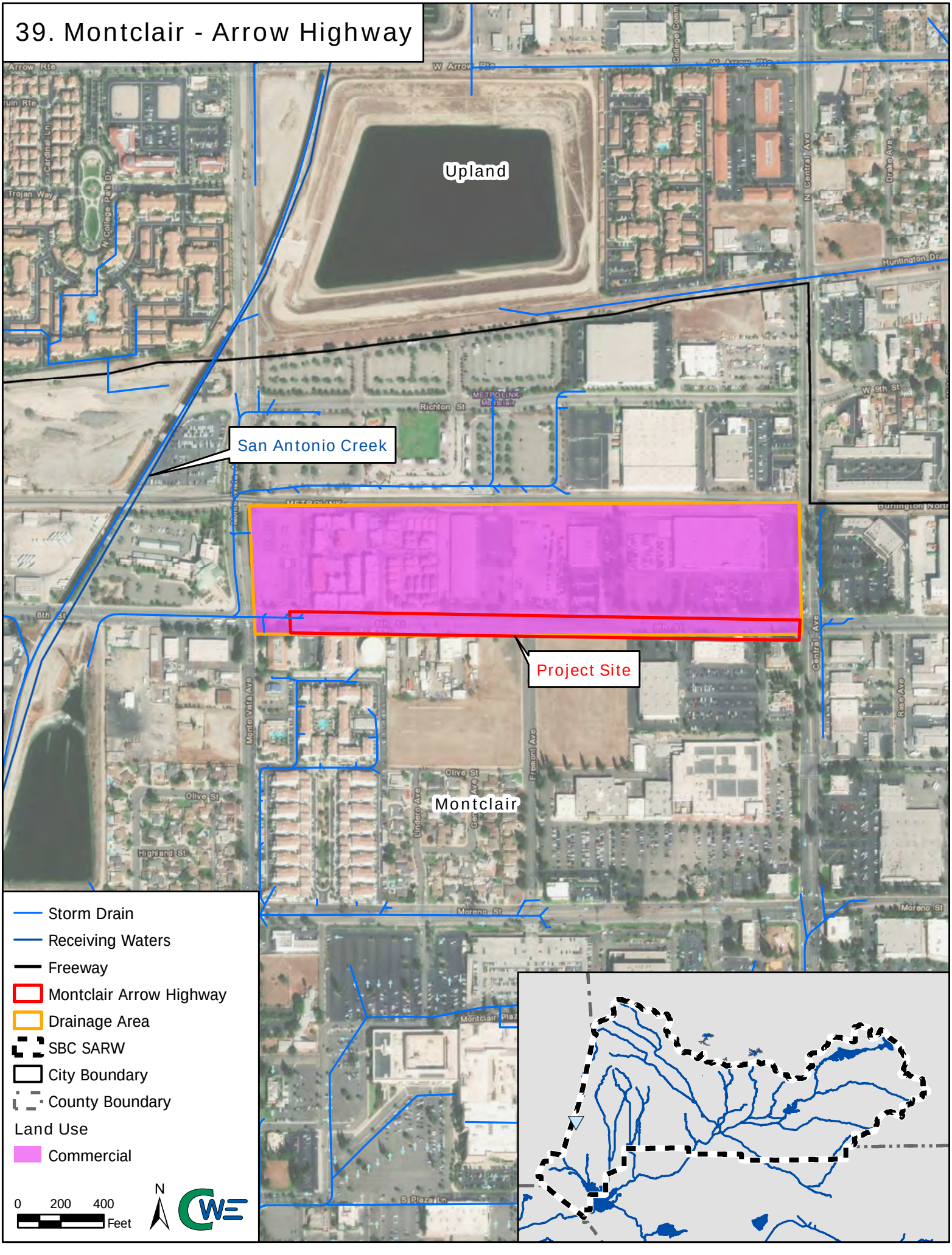

36. Turner Basin
Day Creek
Cucamonga Cyn Wash
Cucamonga Creek
Project Site
Upland
Rancho Cucamonga
Ontario
210
30
10
60
Storm Drain
Receiving Waters
Freeway
Turner Basin
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0 3,000 6,000
Feet
N


37. Ely Basin
Cucamonga Cyn Wash
Cucamonga Creek
Upland
Rancho Cucamonga
San Antonio Creek
Montclair
Deer Creek
Ontario
Project Site
Cucamonga Creek
Cypress Channel
Storm Drain
Receiving Waters
Freeway
Ely Basins
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Commercial
Education
Industrial
Residential
Transportation
Vacant
0 2,000 4,000
Feet
N

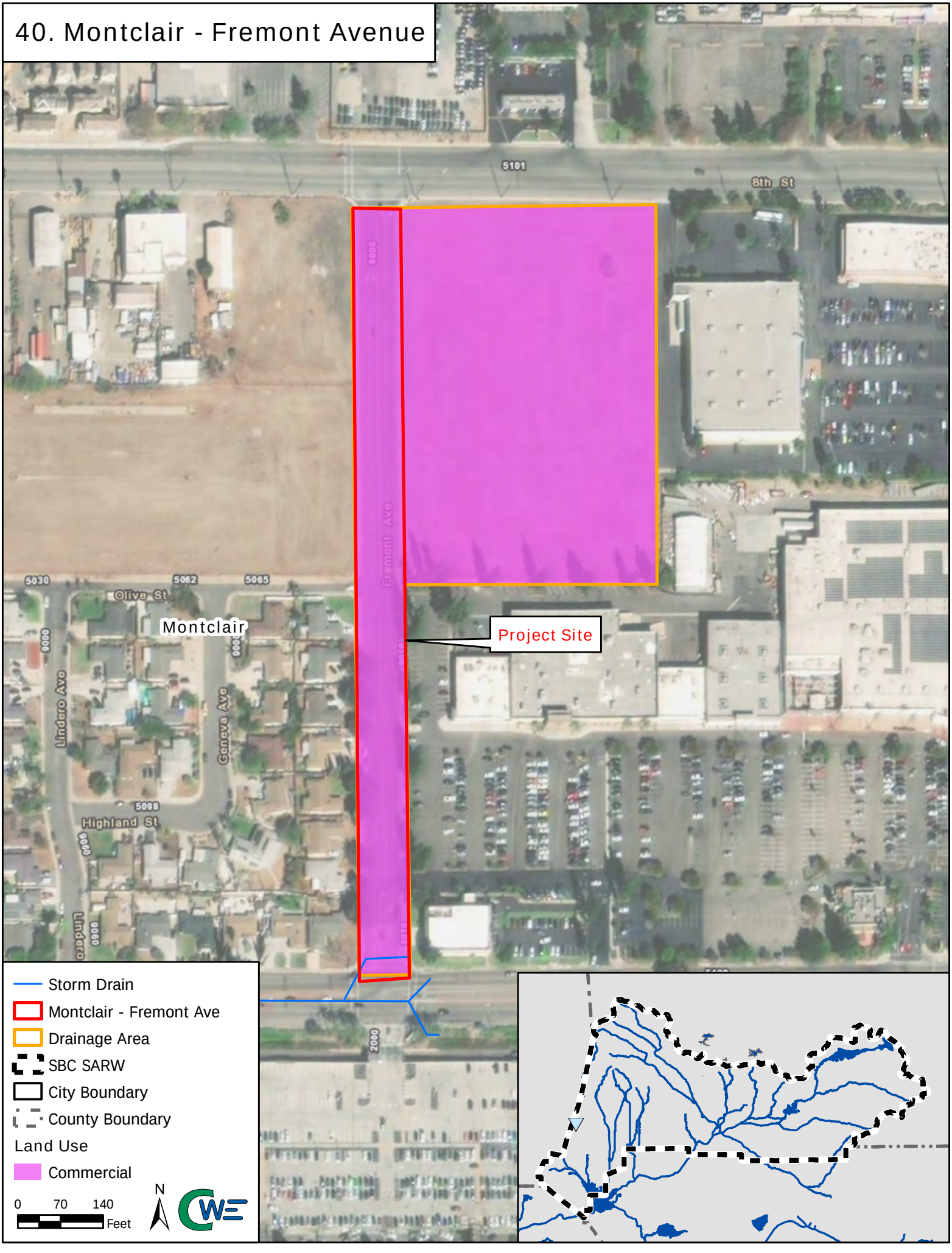
38. Montclair Basins



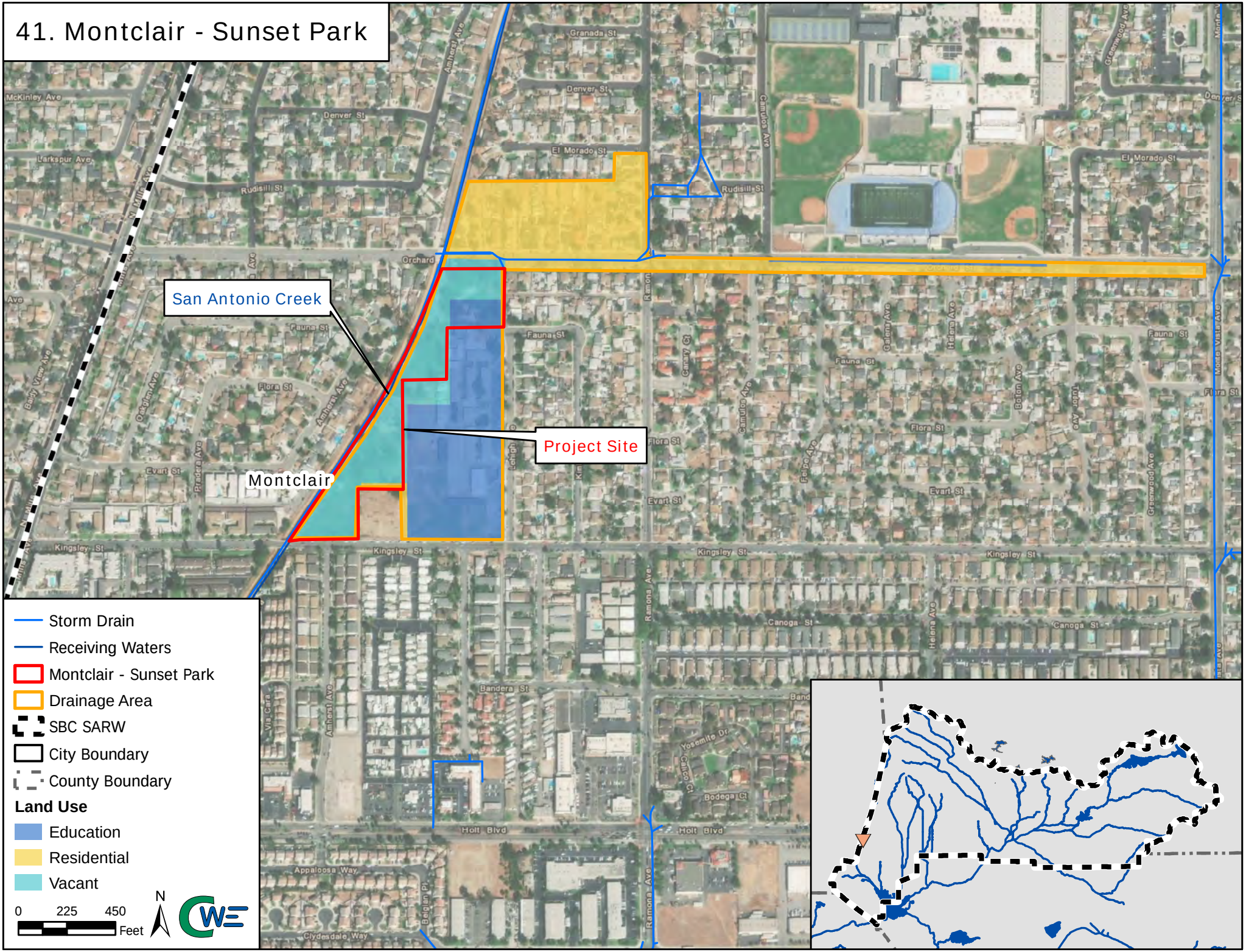
39. Montclair - Arrow Highway



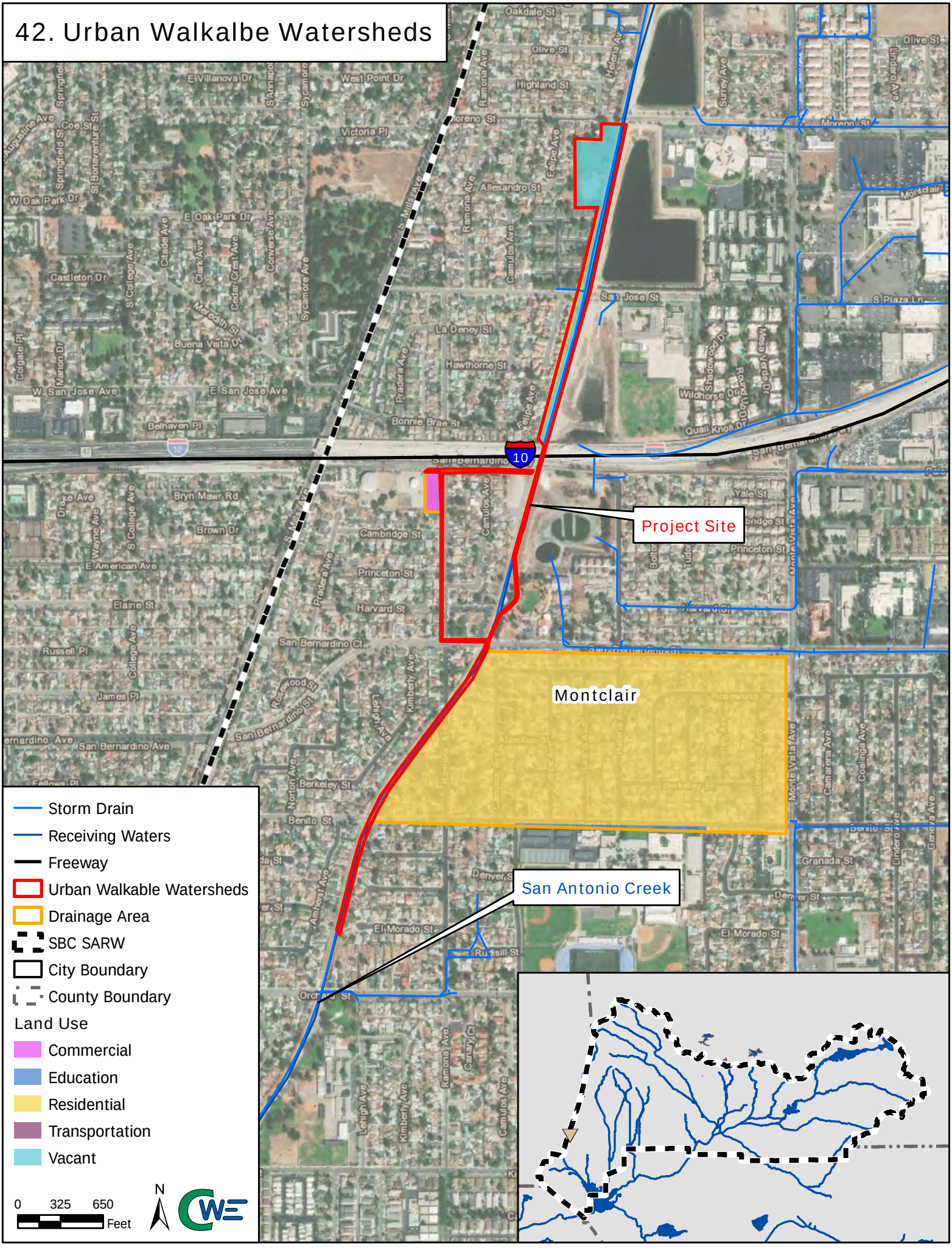
40. Montclair - Fremont Avenue



41. Montclair - Sunset Park

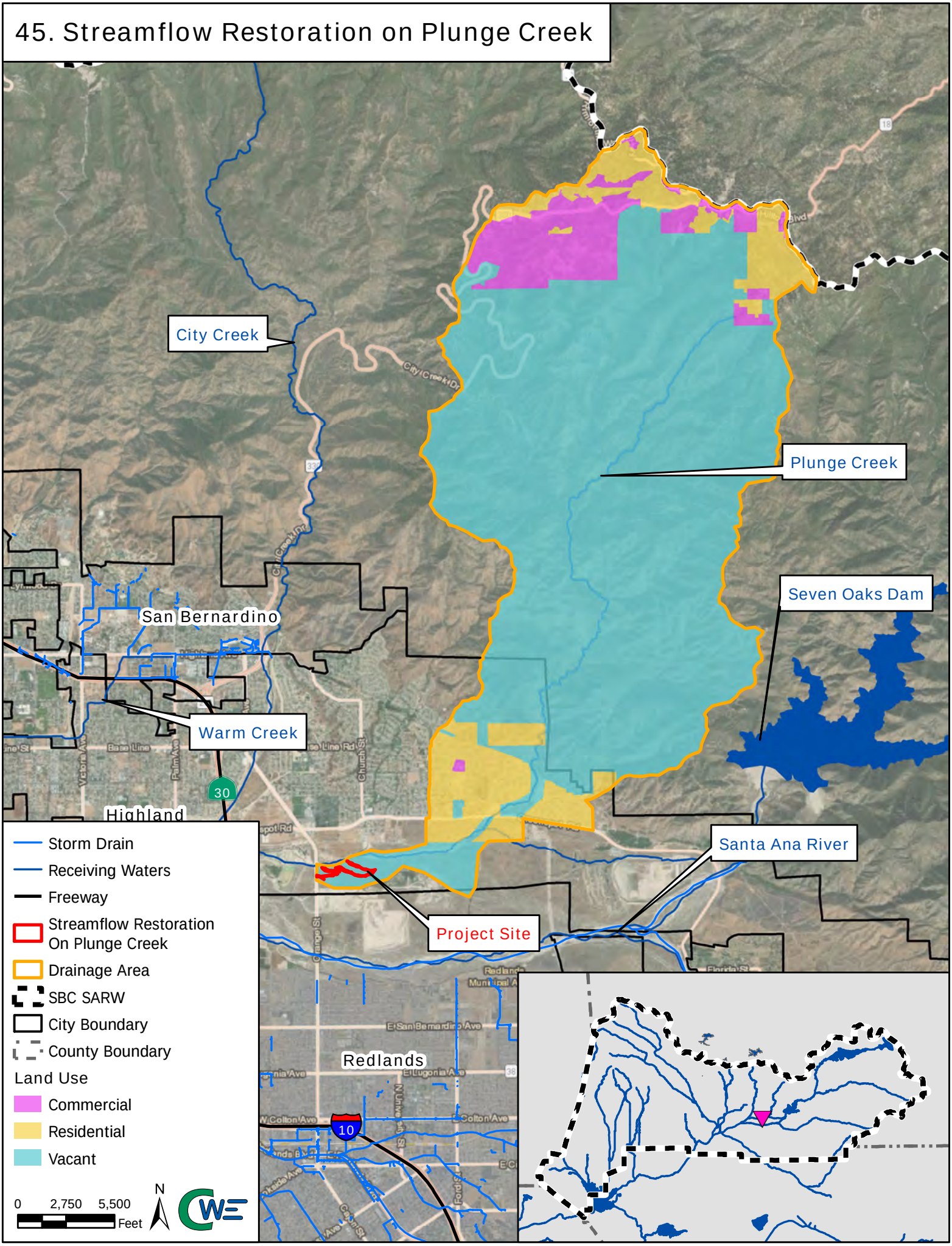


42. Urban Walkalbe Watersheds

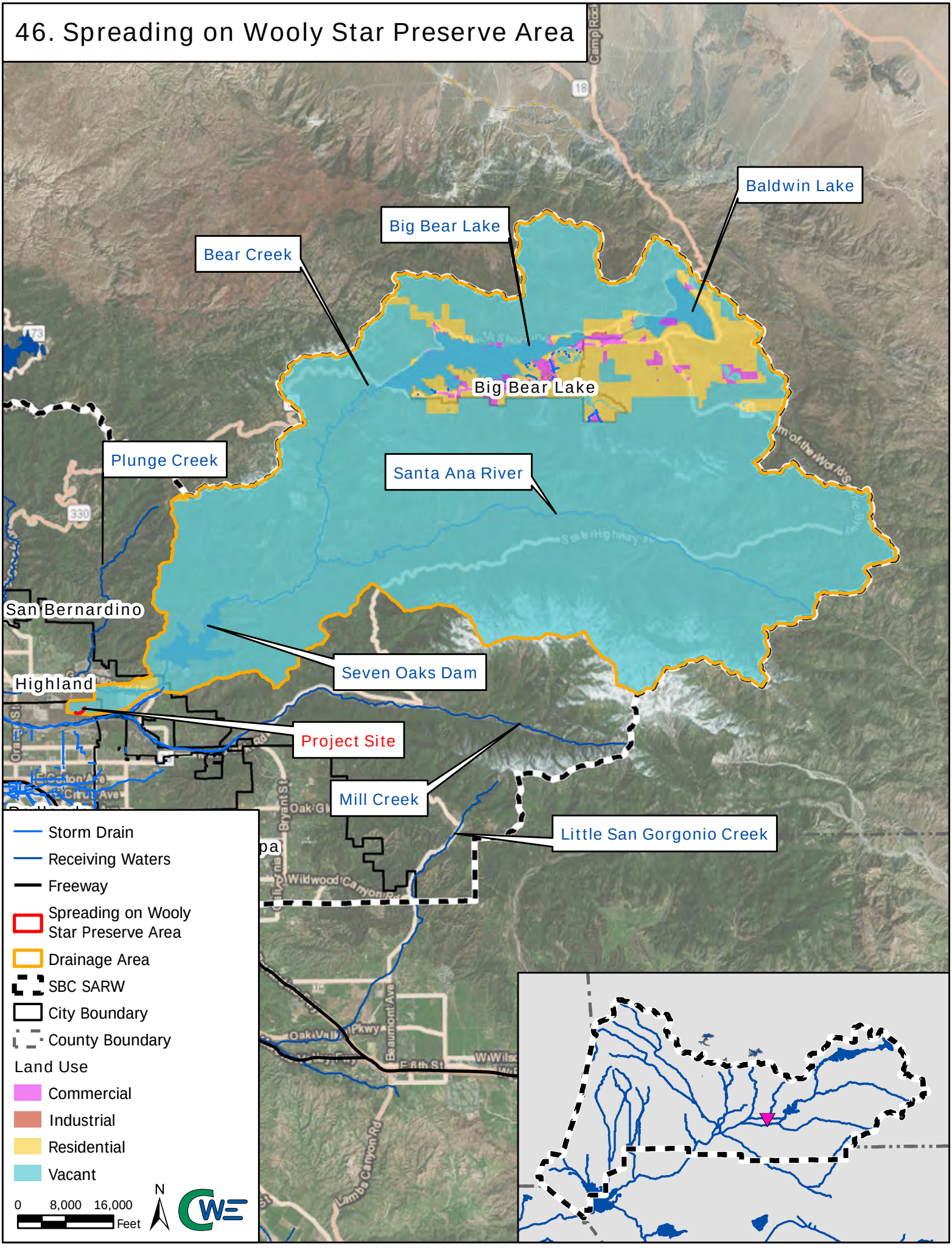


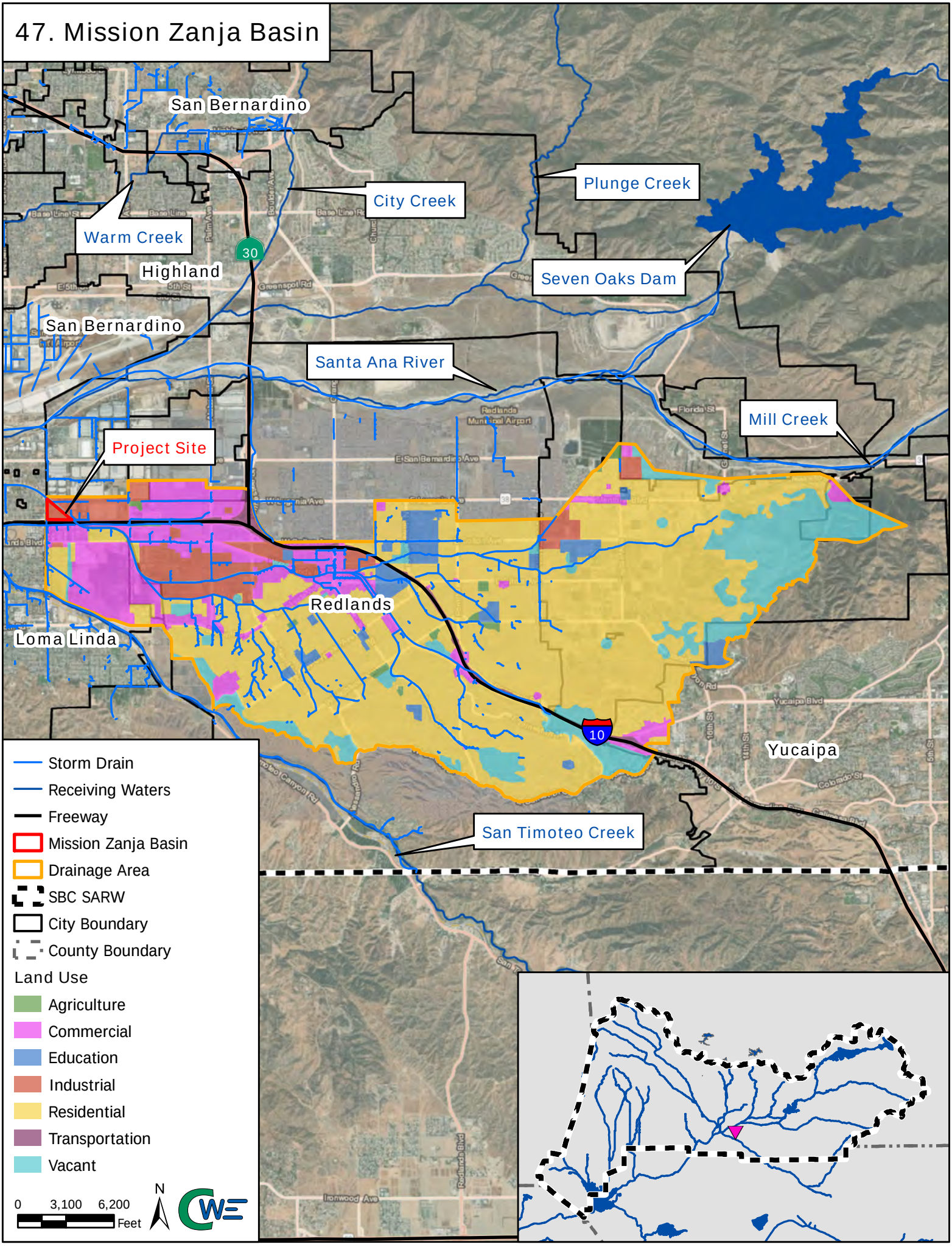
44. College Heights and Upland Percolation Basins

45. Streamflow Restoration on Plunge Creek



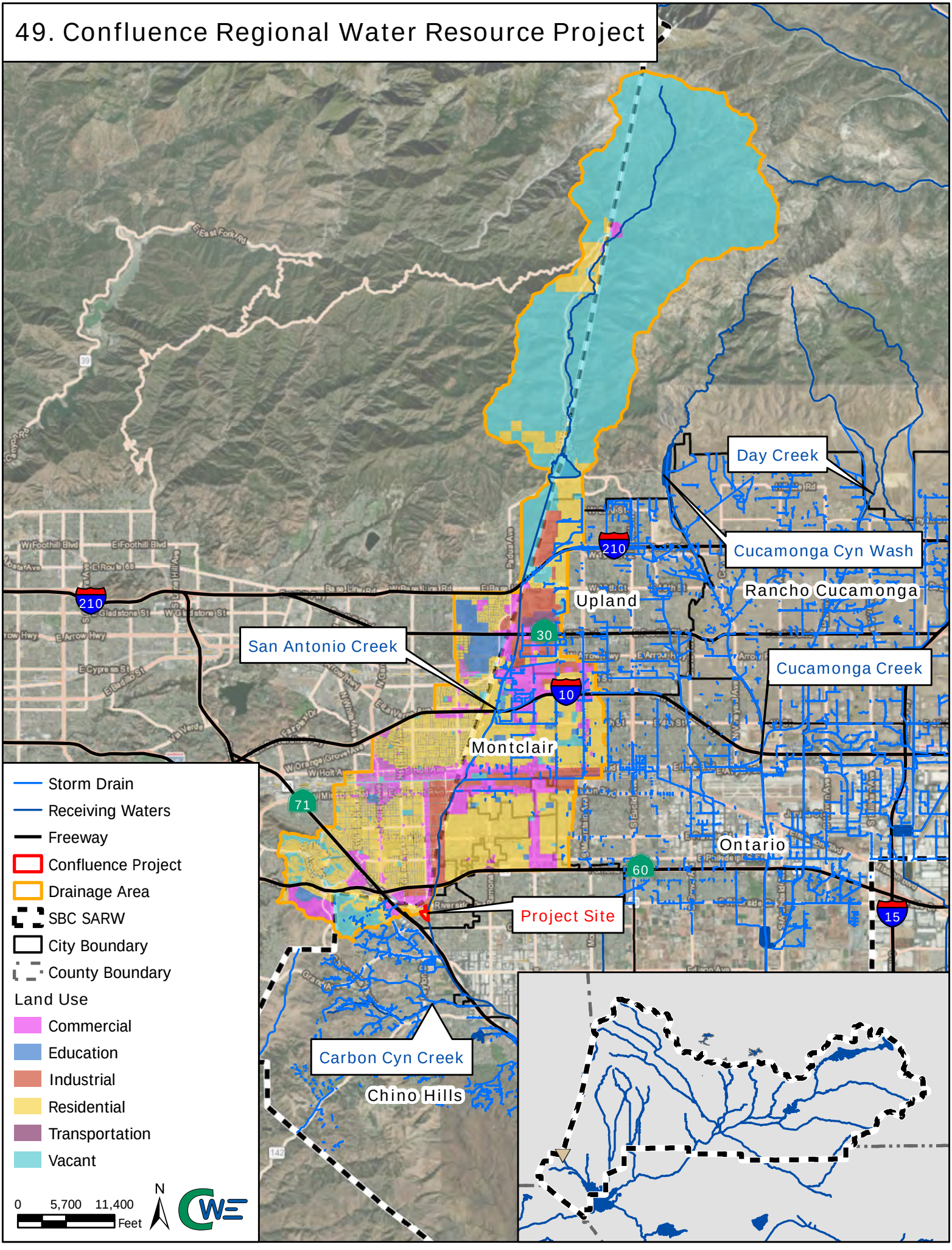
46. Spreading on Wooly Star Preserve Area



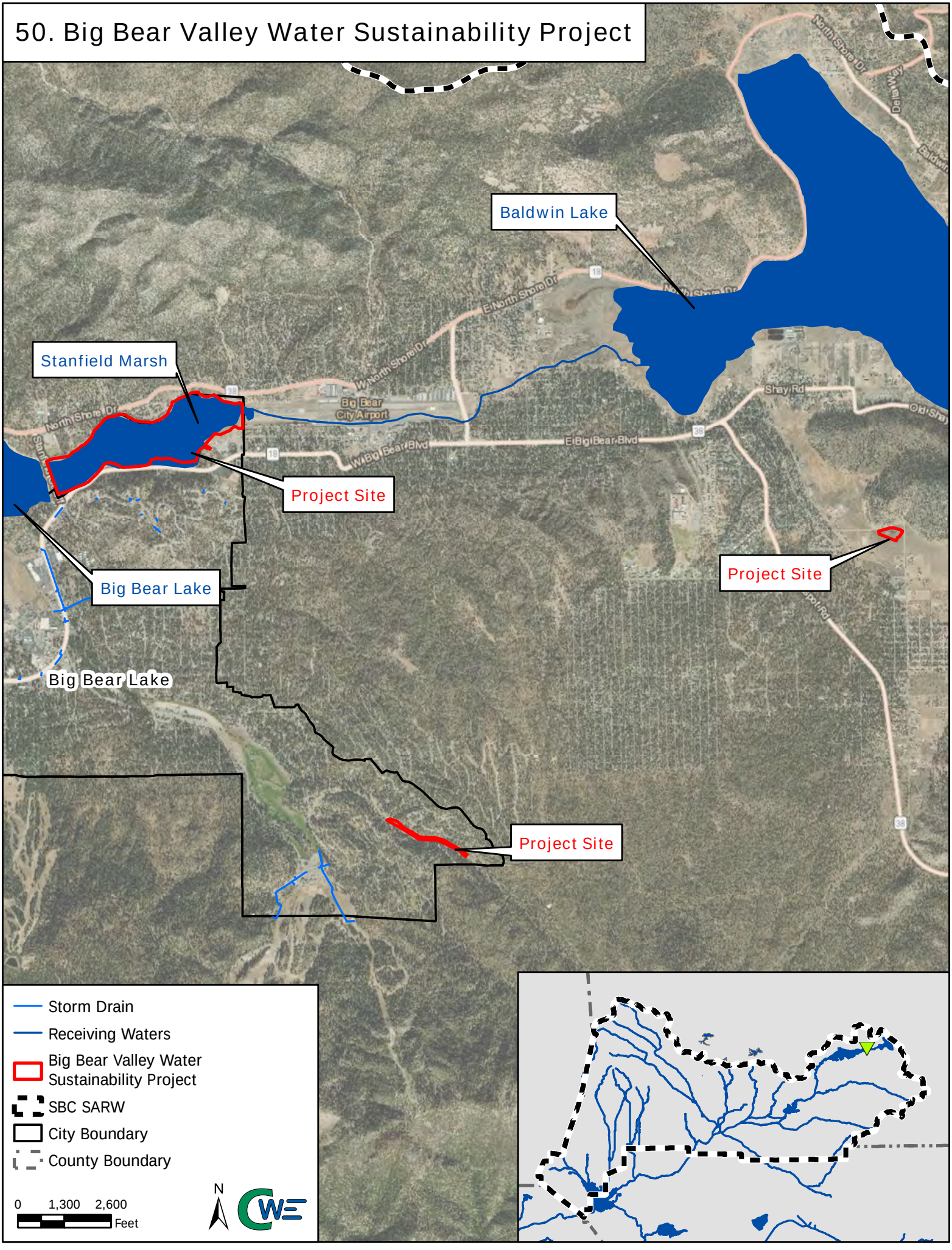

47. Mission Zanja Basin
San Bernardino
City Creek
Plunge Creek
Warm Creek
Highland
30
Seven Oaks Dam
San Bernardino
Santa Ana River
Mill Creek
Project Site
Redlands
Loma Linda
10
Yucaipa
San Timoteo Creek
Storm Drain
Receiving Waters
Freeway
Mission Zanja Basin
Drainage Area
SBC SARW
City Boundary
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
3,100
6,200
Feet
N

48. Riverside Corona Feeder

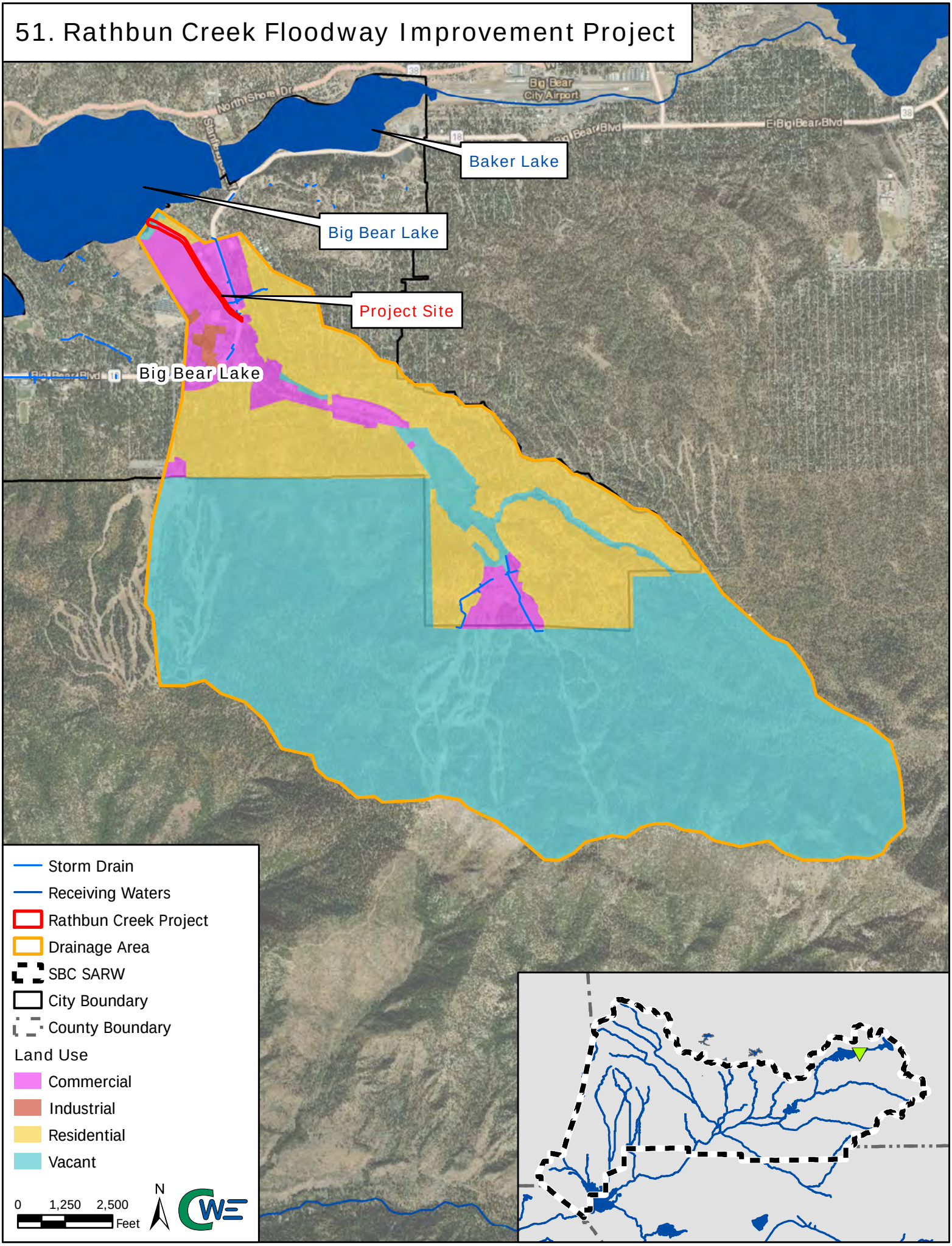
49. Confluence Regional Water Resource Project



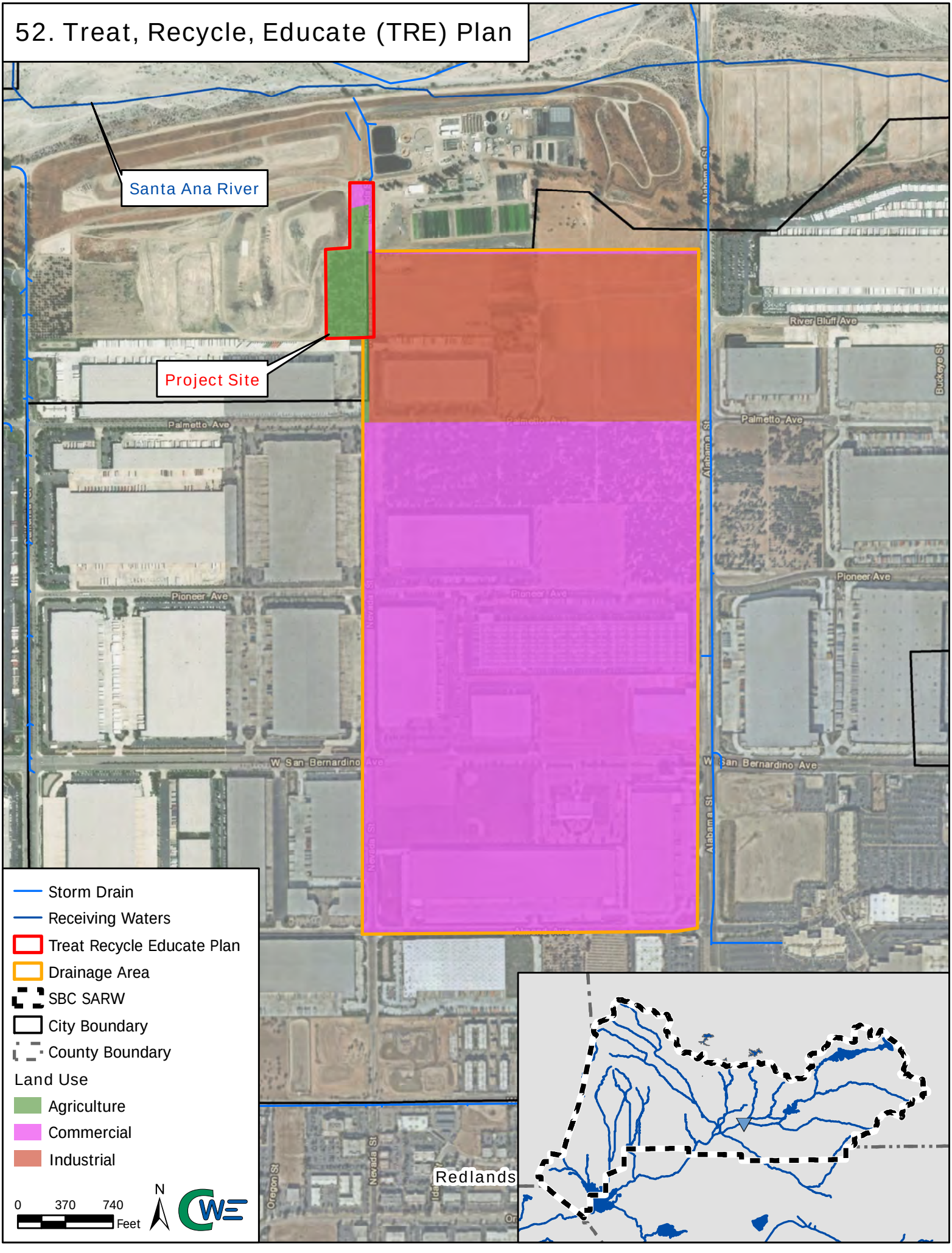
50. Big Bear Valley Water Sustainability Project



51. Rathbun Creek Floodway Improvement Project



52. Treat, Recycle, Educate (TRE) Plan



Attachment G

Project Selection and Metrics-Based Analysis

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Project Selection and Metrics-Based Analysis

Project Number	Project	Lead Agency	Project Description	Water Quality Benefits	Pollutant Load Reduction	Stormwater Runoff Reduction	Water Supply Benefits	Stormwater Recharge	Recycled Water Recharge	Flood Management Benefits	Runoff Rate Reduction	Runoff Volume Reduction	Flood Elevation Reduction	Removal of Parcels/Structures from the 100-Year Floodplain	Property Value Saved	Environmental Benefits	Wetlands Enhancement/Creation	Riparian Area Enhancement	Streambed Restoration	Increased Urban Green Space	Community Benefits	Provide Employment Opportunities	Increase Public Education	Increase Community Involvement	Trails Enhancement/Creation	Public Use Areas Enhancement/Creation	Full Project Cost Estimate	SBCFCD has approved concept?
1	Hawker Crawford Channel Storm Drain	SBCFCD	Existing undersized trapezoidal channel cuts through a field and discharges into San Sevaine Basin No. 3, which has an infiltration rate of 0.5 feet per day. Proposed project will take flow into a box culvert sized to carry the 100-year flow rate (Q) and discharge into San Sevaine Basin No. 1, which has a higher infiltration rate (2.5 ft/day).	X	2.4E+12 MPN *E. coli*	12 afy	X	12 afy		X		12 afy		3 parcels	$1.8 million						X	67 job-years					**$6,231,000**	Y
2	West Fontana Channel - Hickory Basin to Banana Basin	SBCFCD	Existing undersized riprap-lined trapezoidal channel floods surrounding parcels during high return interval events. Proposed project will enlarge the channel to contain the 100-year storm event and add a bioswale to the north side that treats stormwater runoff from areas north of the channel.	X	1.3E+12 MPN *E. coli*	7.4 afy				X		7.4 afy	up to 4.76 ft	6 parcels	$0.2 million	X		0.75 ac		0.75 ac	X	108 job-years					**$10,000,000**	Y
3	Grove Basin Storm Drain	SBCFCD	Grove Basin has a gated outlet structure which is connected to a 66-inch Reinforced Concrete Pipe (RCP). This 66-inch RCP currently discharges onto Grove Avenue causing street flooding and the polluted discharge eventually reaches Prado Park Lake. Proposed project will reroute the flows to a 108-inch RCP going eastward along Chino Avenue and discharge to Lower Cucamonga Spreading Grounds.	X	3.8E+12 MPN *E. coli*	61 afy	X	61 afy		X	X	61 afy									X	108 job-years					**$10,000,000**	Y
4	Randall Basin Outlet and Colton Storm Drain Project 3-5	SBCFCD	Randall Basin is a flood control basin that currently can only discharge excess flows overland in an uncontrolled emergency spillway to Randall Avenue. Proposed project will allow Randall Basin to be managed as a recharge facility. Project will include control structure at basin outlet and a new storm drain to the Santa Ana River.	X	3.5E+12 MPN *E. coli*	57 afy	X	57 afy		X		180 afy									X	108 job-years					**$10,000,000**	Y
5	Cable Creek Basin (Upper)	SBCFCD	Currently uncontrolled and unregulated flows from Cable Creek discharge to the Cajon Wash. Proposed project will create a new basin on Cable Creek upstream of Little League Drive in north San Bernardino. The basin will capture sediment and polluted runoff. The project will also provide a water supply benefit to the Bunker Hill groundwater basin through groundwater recharge.	X	1.7E+14 MPN *E. coli*	859 afy	X	859 afy		X	X	859 afy									X	217 job-years					**$20,000,000**	Y
6.1	Warm Creek - Baseline Street to Sand Creek Confluence - Concept 1	SBCFCD	Warm Creek is an undersized earth-lined trapezoidal channel between Baseline Street and the improved confluence with Sand Creek. Warm Creek Concept 1 will increase the width of the channel, which will increase infiltration. The channel will be lined with riprap and velocity will be controlled by grouted riprap grade breaks. A trail is also proposed along a portion of the site, to be maintained by the Cities of San Bernardino and Highland.	X	1.4E+13 MPN *E. coli*	13.5 afy	X	13.5 afy		X		13.5 afy	up to 0.32 ft			X				2.42 ac	X	69 job-years			5,280 ft	2.42 ac.	**$6,350,000**	N
6.2	Warm Creek - Del Rosa Confluence to Sand Creek Confluence - Concept 2	SBCFCD	Warm Creek Concept 2 will improve water quality by adding a bioswale on each side of the channel at locations where it is feasible to capture runoff from intersecting storm drains. Walls will separate the bioretention facilities from the flood control channel, and the channel will be deep enough to contain the entire 100-year flood flow. The project will incorporate a trail to be maintained by the Cities of San Bernardino and Highland.	X	3.7E+13 MPN *E. coli*	44 afy				X			up to 2.00 ft	119 parcels	$36.6 million	X		2.08 ac		6.02 ac	X	284 job-years			8,580 ft	6.02 ac	**$26,126,325**	N
7.1	Little Sand Creek - Concept 1	SBCFCD	Little Sand Creek is a channel with a riprap bottom and rail-and-wire revetment with sheet metal backing on the sides. Concept 1 will improve water quality and flood control with the incorporation of a bioswale to capture and treat stormwater flows entering from the north side of the channel. The bioswale will be separated from the improved flood control channel by a concrete wall.	X	1.5E+12 MPN *E. coli*	9 afy				X			up to 3.08 ft			X		1.06 ac		1.06 ac	X	74 job-years					**$6,825,600**	N
7.2	Little Sand Creek - Concept 2	SBCFCD	Little Sand Creek Concept 2 will take advantage of publicly owned lands on the north side of the channel to improve water supply and water quality. A small basin will be constructed that will take diverted dry-weather runoff from Little Sand Creek for infiltration/groundwater recharge.	X	5.4E+13 MPN *E. coli*	116 afy	X	116 afy		X	0.7 cfs	116 afy									X	35 job-years					**$3,216,957**	N
8	Mission Channel - Santa Ana River to Tennessee Street	SBCFCD	Mission Channel is an undersized earth and riprap trapezoidal channel that bisects a disadvantaged community in eastern San Bernardino and western Redlands. Proposed project will benefit the community by adding a trail connecting the Santa Ana River Trail and the Orange Blossom Trail, while upgrading the channel to be capable of carrying the 100-year storm event. The channel will continue to be an earthen channel, and the increased width will increase the volume of infiltration.	X	1.3E+13 MPN *E. coli*	51 afy	X	51 afy		X	1.3 cfs	51 afy	X	X	X	X				3.08 ac	X	89 job-years			8,900 ft	3.08 ac	**$8,190,000**	N
9	Wilson Creek - 10th Street to Interstate 10	SBCFCD	Wilson Creek flows through west Yucaipa as a 60-foot wide channel with rail and wire revetment on the side slopes. The efficiency of infiltration from the earth-lined channel is less than optimal, as the channel is prone to scour and deposition, which alters the stream bed and constricts the spread of flows. The proposed project will improve infiltration efficiency, reduce scour, enchance the flood capacity, and improve the trail system along the channel.	X	8.8+12 MPN *E. coli*	19 afy	X	19 afy		X	0.4 cfs	19 afy	up to 8.80 ft	131 parcels	$30.8 million	X				3.47 ac	X	120 job-years			7,550 ft	3.47 ac	**$11,000,000**	N
10.1	Rialto Channel - Etiwanda to Willow - Concept 1	SBCFCD	Rialto Channel conveys urban runoff from the Cactus Basin complex in an undersized earth and rock-lined trapezoidal channel. The proposed project concept will widen the channel to allow for more infiltration while deepening the channel to provide additional flood capacity. The project will also provide community benefits to severely disadvantaged communities within the City of Rialto through the creation of a multi-use trail to connect with the popular Pacific Electric Trail.	X	2.5E+13 MPN *E.coli*	114 afy	X	114 afy		X	2.3 cfs	114 afy	X	X	X	X				7.16 ac	X	223 job-years			15,600 ft	7.16 ac	**$20,580,000**	N
10.2	Rialto Channel - Etiwanda to Willow - Concept 2	SBCFCD	Rialto Channel Concept 2 will widen and deepen Rialto Channel to provide flood protection for surrounding residents and businesses. The concept will increase infiltration in the upper portion through Armorflex blocks, while the lower portion will convey flood flows through a concrete lined rectangular channel. The project will include a multi-use trail, as described under Concept 1 above.	X	7.1E+12 MPN *E.coli*	33 afy	X	33 afy		X	0.6 cfs	33 afy	X	X	X	X				7.16 ac	X	142 job-years			15,600 ft	7.16 ac	**$13,098,000**	N
11	Cactus Basin #4 & 5	SBCFCD	Cactus Basin #4 and 5 will provide multiple benefits to disadvantaged communities in the City of Rialto and the Inland Empire. The project will provide a large increase in the volume of stormwater that can be captured for groundwater recharge. The project will enhance water quality by preventing bacteria from reaching downstream water bodies. The project will also protect thousands of structures from flooding.	X	3.7E+13 MPN *E. coli*	170 afy	X	170 afy		X	600 cfs	170 afy	up to 3.44 ft	1,504 parcels	$451 million						X	304 job-years					**$28,000,000**	Y
12	Plunge Creek Stream Bed Restoration and Elder Creek Channel Improvement	SBCFCD	The project, a continuation of San Bernardino Valley Water Conservation District's Plunge Creek restoration project, will rehabilitate the ecological function of the wash. The project will spread stormwater through braided channels to restore natural watershed processes, enhance groundwater recharge, and improve downstream water quality. The project will also improve Elder Gulch upstream of the confluence in a way that reduces sedimentation and protects surrounding areas from flooding.	X	1.6E+13 MPN *E.coli*	80 afy	X	80 afy		X	3.6 cfs	80 afy	X	X	X	X		25 ac	1,700 ft		X	81 job-years					**$7,477,000**	Y

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Project Selection and Metrics-Based Analysis

Project Number	Project	Lead Agency	Project Description	Water Quality Benefits	Pollutant Load Reduction	Stormwater Runoff Reduction	Water Supply Benefits	Stormwater Recharge	Recycled Water Recharge	Flood Management Benefits	Runoff Rate Reduction	Runoff Volume Reduction	Flood Elevation Reduction	Removal of Parcels/Structures from the 100-Year Floodplain	Property Value Saved	Environmental Benefits	Wetlands Enhancement/Creation	Riparian Area Enhancement	Streambed Restoration	Increased Urban Green Space	Community Benefits	Provide Employment Opportunities	Increase Public Education	Increase Community Involvement	Trails Enhancement/Creation	Public Use Areas Enhancement/Creation	Full Project Cost Estimate	SBCFCD has approved concept?
13	Wildwood Channel - Interstate 10 to Holmes Street	SBCFCD	Wildwood Channel conveys flow in an undersized channel lined with sand and gravel. The proposed project will widen the channel to increase infiltration capacity and flood protection, while providing grade breaks that reduce velocities. The project will also enhance the existing multi-use trails in this disadvantaged community.	X	1.8E+12 MPN *E. coli*	38 afy	X	38 afy		X	0.8 cfs	38 afy	X	X	X	X				6.49 ac	X	181 job-years			14,140 ft	6.49 ac	**$16,670,920**	**N**
14.1	Del Rosa Channel - Pacific Street to Del Rosa Avenue - Concept 1	SBCFCD	Del Rosa Channel is an undersized rectangular channel with a riprap-lined bottom and rail-and-wire revetment on the sides. The limited amount of public right-of-way reduces the opportunities for additional enhancements. Concept 1 will widen the channel from 20 feet to 30 feet and deepen it to handle flood flows. The composition of the channel bottom will remain porous for infiltration. A new culvert will be required across Pacific Avenue.	X	2.6E+12 MPN *E. coli*	12 afy	X	12 afy		X		12 afy	up to 5.43 ft	97 parcels	$26.7 million						X	86 job-years					**$7,878,445**	**N**
14.2	Del Rosa Channel - Pacific Street to Del Rosa Avenue - Concept 2	SBCFCD	Del Rosa Channel Concept 2 will only widen the channel without deepening it. The slopes will be protected with stairstepped rock gabion walls, eliminating the need for permanent concrete structures within the channel right-of-way. Flooding will be reduced, but the channel will not be capable of carrying the 100-year flood. The existing culvert at Pacific Avenue will remain in place.	X	1.1E+12 MPN *E. coli*	5 afy	X	5 afy		X		5 afy	up to 1.86 ft								X	32 job-years					**$2,930,297**	**N**
15	Etiwanda Channel Invert Repair and Trail Project	SBCFCD	Etiwanda Channel and San Sevaine Channel are two rectangular concrete channels laterally contiguous to one another separated by a channel wall. The channels are subject to scour issues. The proposed project will remove the wall between the channels, adress the scouring issues, and provide a trail improvement, benefiting the community as part of the San Sevaine Trail Phase I Segment 2 in the City of Fontana.							X			X			X					X	X	16 job-years	X		X	X	**$1,500,000**	**N**
16	West State Street Storm Drain Segment III and Brooks Basin Inlet Enhancement	SBCFCD	West State Street Storm Drain is an open channel that runs between West State Street and the Union Pacific Railroad in the Cities of Montclair and Ontario. The storm drain conveys runoff westward to San Antonio Creek Channel, while upstream of the Channel there is an inlet that diverts low flows into Brooks Basin. The project will enlarge the inlet and enhance the channel to provide flood protection and to capture, convey, and divert more stormwater to Brooks Basin for infiltration (groundwater recharge).	X	5.4E+12 MPN *E. coli*	117 afy	X	117 afy		X	10 cfs	117 afy	X	X	X						X	126 job-years					**$11,660,000**	**Y**
17	Carbon Canyon Creek Channel - Pipeline Avenue to Peyton Drive	SBCFCD	Carbon Canyon Creek Channel is a riprap lined undersized trapezoidal channel between Pipeline Avenue and Peyton Drive. The proposed project will widen the channel but maintain a soft bottom. This design will increase flood protection and provide additional opportunity for stormwater flows to infiltrate and recharge groundwater supplies.	X	3.2E+12 MPN *E. coli*	15 afy	X	15 afy		X	0.3 cfs	15 afy	X	X	X						X	228 job-years					**$21,000,000**	**N**
18	Santa Ana River Trail Phase III	SBC Parks	Santa Ana River Trail Phase III will extend the popular public use trail from its current endpoint at Waterman Avenue in San Bernardino to California Street in the City of Redlands. Stormwater improvements along the trail will be sized for the 100-year flood flow from future development conditions. The trail will provide public use areas and green space for disadvantaged communities.													X				9.18 ac	X	41 job-years			19,992 ft	9.18 ac	**$3,786,000**	**Y**
19	Santa Ana River Trail Phase IV	SBC Parks	Santa Ana River Trail Phase IV will complete the trail to Garnet Street in Mentone. The project will provide public use areas and enhance green space. The project will also feature interpretive signage as a public education component.													X				24.27 ac	X	109 job-years	7 signs		52,865 ft	24.27 ac	**$10,000,000**	**Y**
20	Lytle Creek Basin	SBVMWD	The proposed Lytle Creek Basin will be located in the City of Rialto east of Interstate 15, upstream of an existing CEMEX plant. The 60 acre site will have a wetted area of 48 acres and a storage volume of 460 acre-feet.	X	5.5E+14 MPN *E. coli*	4,023 afy	X	4,023 afy		X	X	4,023 afy									X	159 job-years					**$14,685,038**	**N**
21	Devil Canyon Basins	SBVMWD	The existing Devil Canyon Spreading Grounds diverts flow from Devil Creek during very high flow events. The proposed project would increase the capacity of the diversion through the construction of an inflatable armored dam across Devil Creek. Two new recharge cells will be constructed below the existing Basin No. 1, and the transfer structures between the existing basins would be improved. The site will have a wetted area of 35.9 acres and a total storage volume of 242 acre-feet.	X	3.7E+14 MPN *E. coli*	3,631 afy	X	3,631 afy		X	X	3,631 afy									X	258 job-years					**$23,768,911**	**N**
22	City Creek Basin	SBVMWD	The series of nine proposed basins that will be constructed for the City Creek Basin project will be located along over a mile of City Creek on both sides of the 210 Freeway in the City of Highland. The site will have a wetted area of 37.7 acres and a storage volume of 254 acre-feet, and it will be connected at the downstream end to the proposed Plunge Basin II project.	X	7.5E+14 MPN *E. coli*	5,247 afy	X	5,247 afy		X	X	5,247 afy									X	356 job-years					**$32,823,285**	**N**
23	Cable Creek Basin (Lower)	SBVMWD	This Cable Creek Basin project will be located just downstream of the proposed SBCFCD Cable Creek Basin project. Unlike the SBCFCD project, flow will be diverted into the lower Cable Creek Basin project from the main channel via an inflatable rubber dam. The 37.9 acres of wetted area will have a storage volume of 281 acre-feet over three separate basin cells.	X	4.1E+14 MPN *E. coli*	2,978 afy	X	2,978 afy		X	X	2,978 afy									X	266 job-years					**$24,520,683**	**N**
24	Lytle-Cajon Basins	SBVMWD	The Lytle-Cajon Basin project will be located just upstream of the Lytle-Cajon Radial Gate and spillway. The proposed project would result in the construction of eight in-channel recharge basins. In total the project would have a total wetted are of 43 acres and a storage volume of 244 acre-feet.	X	X	3,408 afy	X	3,408 afy		X	X	3,408 afy									X	115 job-years					**$10,668,323**	**N**
25	Mill Creek Inlet	SBVMWD	The Mill Creek Inlet project will improve the transfer of flow from Mill Creek into the existing series of percolation basins in the Mill Creek wash area. The capacity of the existing inlet will be increase from 110 cubic feet per second (cfs) to 210 cfs and will involve replacement of culverts underneath the existing flood control levee.	X	1.8E+14 MPN *E. coli*	887 afy	X	887 afy		X	100 cfs	887 afy									X	28 job-years					**$2,595,052**	**N**
26	Plunge Creek Basin I	SBVMWD	The Plunge Creek Basin I project will place a basin downstream of the SBVWCD and SBCFCD Plunge Creek Restoration Projects. The single cell basin will capture water from an inflatable rubber dam diversion across Plunge Creek. The project will have a total wetted area of 6 acres and a storage volume of 40 acre-feet.	X	3.5E+14 MPN *E. coli*	2,481 afy	X	2,481 afy		X	X	2,481 afy									X	118 job-years					**$10,900,345**	**N**

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Project Selection and Metrics-Based Analysis

Project Number	Project	Lead Agency	Project Description	Water Quality Benefits	Pollutant Load Reduction	Stormwater Runoff Reduction	Water Supply Benefits	Stormwater Recharge	Recycled Water Recharge	Flood Management Benefits	Runoff Rate Reduction	Runoff Volume Reduction	Flood Elevation Reduction	Removal of Parcels/Structures from the 100-Year Floodplain	Property Value Saved	Environmental Benefits	Wetlands Enhancement/Creation	Riparian Area Enhancement	Streambed Restoration	Increased Urban Green Space	Community Benefits	Provide Employment Opportunities	Increase Public Education	Increase Community Involvement	Trails Enhancement/Creation	Public Use Areas Enhancement/Creation	Full Project Cost Estimate	SBCFCD has approved concept?
27	Plunge Creek Basin II	SBVMWD	The Plunge Creek Basin II project will be located just upstream of the confluence of Plunge Creek and City Creek. The basin will receive flows from an inflatable dam placed across Plunge Creek. The project will have a total wetted area of 10.7 acres and a storage volume of 66 acre-feet.	X	X	1,050 afy	X	1,050 afy		X	X	1,050 afy									X	139 job-years					**$12,808,867**	N
28	Twin Creek Spreading Grounds	SBVMWD	The existing Twin Creek Spreading Grounds are flow-through basins located within Twin Creek north of Lynwood Drive in the City of San Bernardino. Exising basins within the spreading grounds were originally built to attenuate flows, but over the years the basin walls have been eroded or purposely breached, so flows currently pass through unobstructed. The proposed project will reconstruct and armor the basin walls, constructing one new cell, and providing new transfer structures between the basin cells.	X	5.9E+14 MPN *E. coli*	4,087 afy	X	4,087 afy		X	X	4,087 afy									X	181 job-years					**$16,677,990**	N
29	Vulcan 2 Basin	SBVMWD	The Vulcan 2 Basin project will improve groundwater recharge in a new basin located near the severely disadvantaged community of Muscoy. The basin will divert flow from the Devil Creek Diversion Channel through an inflatable dam. The total wetted area will be 35.2 acres and the storage volume will be 383 acre-feet.	X	X	3,441 afy	X	3,441 afy		X	X	3,441 afy									X	339 job-years					**$31,221,404**	N
30	Waterman Basins	SBVMWD	The Waterman Basins project will improve the existing diversion structure at the Waterman Basins northeast of Waterman Avenue and 40th Street in the City of San Bernardino. The improvements will refurbish two existing radial gate systems and provide two new gates for a maximum diversion capacity of 1,000 cfs. Upon completion, Waterman Basins will attain a total wetted area of 31.5 acres and a storage volume of 180 acre-feet.	X	X	1,675 afy	X	1,675 afy		X	X	1,675 afy									X	110 job-years					**$10,207,218**	N
31	Wineville Recycled Pipeline Project	IEUA	The Wineville Recycled Pipeline Project will make changes to three basins. The project will include upgrading Wineville Basin to be capable of infiltration by adding a gate to the outlet and improving the dam. Detained stormwater will be pumped to Jurupa Basin via a new pump and conveyance pipeline. Stormwater will then be pumped from Jurupa Basin through existing lines to the RP3 Basins, which will be enlarged and improved to accept more stormwater and recycled water.	X	1.4E+14 MPN *E. coli*	3,166 afy	X	3,166 afy	3,535 afy	X	X	3,166 afy									X	231 job-years					**$21,300,000**	N
32	San Sevaine Basins	IEUA	Recharge in San Sevaine Basin will be increased by recycling water through a new pump and conveyance pipeline from the Basin No. 5, which has a low infiltration rate, to Basin No. 3, which has a higher infiltration rate. A new berm will also be constructed within Basin No. 5.	X	9.1E+13 MPN *E. coli*	642 afy	X	642 afy	1,911 afy	X		642 afy									X	38 job-years					**$3,550,000**	N
33	Lower Day Basin	IEUA	The improvements proposed as part of the Lower Day Basin project include the construction of a secondary diversion structure within the channel to more efficiently divert flows into the basin. Within the basin, capacity will be increased by removing a mid-level outlet and reconstructing an embankment.	X	1.0E+13 MPN *E. coli*	75 afy	X	75 afy		X		75 afy									X	26 job-years					**$2,480,000**	N
34	Declez Basin	IEUA	Declez Basin will be improved by reconstructing the existing embankment and spillway at a higher elevation to increase storage. Additionally, a gate will be installed on an existing outlet, improving the ability of IEUA to manage the basin as a recharge facility. The improvements will recharge an average of 241 acre-feet of stormwater to the groundwater basin annually.	X	1.1E+13 MPN *E. coli*	241 afy	X	241 afy		X		241 afy									X	44 job-years					**$4,070,000**	N
35	Victoria Basin	IEUA	The proposed Victoria Basin project will improve the recharge and flood control capabilities of the existing Victoria Basin by abandoning the mid-level outlet that allows flows to the San Sevaine Channel. By blocking the outlet and extending the existing lysimeter stations, the capacity of the basin for recharge will be increased, as the basin will be able to hold a greater volume of water.	X	6.1E+12 MPN *E. coli*	43 afy	X	43 afy	120 afy	X		43 afy									X	1 job-years					**$150,000**	N
36	Turner Basin	IEUA	The existing spillway at Turner 2 Basin was built long before upstream development in the City of Rancho Cucamonga required larger stormwater basins at the confluence of Cucamonga Channel and Deer Creek Channel, and it is one of the last remaining pieces of the Turner Basin complex that has yet to be replaced. A new spillway at a higher elevation will allow IEUA to store additional stormwater volume within the basin complex, which will produce an additional annual recharge volume of 66 acre-feet.	X	2.2E+13 MPN *E. coli*	66 afy	X	66 afy		X		66 afy									X	9 job-years					**$890,000**	N
37	Ely Basins	IEUA	The Ely Basin improvements include excavating 470,000 cubic yards of material from within the existing footprint of the basins. IEUA estimated that the increase in the capacity of the basin would yield an average of 221 acre-feet of additional stormwater recharge per year.	X	4.8E+13 MPN *E. coli*	221 afy	X	221 afy		X		221 afy									X	34 job-years					**$3,200,000**	N
38	Montclair Basins	IEUA	The proposed project at Montclair Basin will add one drop inlet structure from Basin 1 to Basin 2, and one drop inlet structure from Basin 2 to Basin 3. The project will allow for better management of groundwater recharge in the basins, and the efficiencies attained will yield an average of 248 acre-feet of additional recharge per year.	X	3.5E+13 MPN *E. coli*	248 afy	X	248 afy		X		248 afy									X	15 job-years					**$1,440,000**	N
39	Montclair - Arrow Highway	City of Montclair	This project will reduce the current four lane major arterial street to a two lane road, allowing for a median that will capture runoff from the street, treat it, and infiltrate it back into the ground.	X	X	X	X	X		X	X	X									X	X					**X**	N
40	Montclair - Fremont Avenue	City of Montclair	This project will reduce the current four lane arterial street to a two lane road, allowing for a median that will capture runoff from the street, treat it, and infiltrate it back into the ground.	X	X	X	X	X		X	X	X									X	X					**X**	N
41	Montclair - Sunset Park	CBWCD / Montclair	This project will develop a walking and biking enviromental trail that incorporates a water feature moving nusance water from Orchard Street from the north end to the south end where it will infiltrate into the ground.	X	X	X	X	X		X	X	X				X				X	X	X	X		X	X	**X**	N

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Project Selection and Metrics-Based Analysis

Project Number	Project	Lead Agency	Project Description	Water Quality Benefits	Pollutant Load Reduction	Stormwater Runoff Reduction	Water Supply Benefits	Stormwater Recharge	Recycled Water Recharge	Flood Management Benefits	Runoff Rate Reduction	Runoff Volume Reduction	Flood Elevation Reduction	Removal of Parcels/Structures from the 100-Year Floodplain	Property Value Saved	Environmental Benefits	Wetlands Enhancement/Creation	Riparian Area Enhancement	Streambed Restoration	Increased Urban Green Space	Community Benefits	Provide Employment Opportunities	Increase Public Education	Increase Community Involvement	Trails Enhancement/Creation	Public Use Areas Enhancement/Creation	Full Project Cost Estimate	SBCFCD has approved concept?
42	Urban Walkable Watersheds	CBWCD	The Urban Walkable Watersheds project will feature a community walking trail that provides connectivity by water infrastructure projects while actively capturing and infiltrating runoff through green infrastructure demonstration projects. An emphasis will be placed on increasing public education and community involvement through educational programs involving nearby public schools.	X	X	X	X	X		X	X	X				X				X	X	X	X	X	X	X	X	N
43	Multipurpose Recharge Basins	CBWCD	The Multipurpose Recharge Basins project proposed by CBWCD will reconceptualize the role of urban recharge basin by integrating native plant restoration and passive recreation with interpretation on perimeters of existing basins. The project will increase areas for public education and recreation while continuing basin recharge.													X		X		X	X	X				X	X	N
44	College Heights and Upland Percolation Basins	CBWCD	The improvements proposed to the College Heights and Upland Percolation Basins will include water quality features to improve urban runoff, flood mitigation, streetscape, passive recreation, and education.													X				X	X	X				X	X	N
45	Streamflow Restoration on Plunge Creek	SBVWCD	The Steamflow Restoration on Plunge Creek project will continue the enhancement of the SBVWCD Plunge Creek Conservation Project by an additional half mile. The additional stream enhancements will converge water onto Plunge Creek or onto Orange Street lessening chances of backflow during high flow events.	X	X	X	X	X		X	X	X				X		X	X		X	X					X	N
46	Spreading on Woolly Star Preserve Area	SBVWCD	The Spreading on Wooly Star Preserve Area (WSPA) will spread Santa Ana River water on the WSPA during events of high flow through the installation of new gates and pipes. Stormwater infiltration will occur in historical remnant channels to better mimic pre-development processes, and this will enhance riparian habitat.	X	X	X	X	X		X	X	X				X		X	X		X	X					X	N
47	Mission/Zanja Basin	SBVWCD	The Mission/Zanja Groundwater Recharge Basin project will place a groundwater rechange basin in vacant lands along the Mission Zanja, reducing stormwater runoff and increase groundwater recharge. Seven possible locations have been identified with the smallest being 65,000 square feet with a recharge rate of 10 feet per day. 15 acre-feet per day could recharge at a flow rate of 7.5 cfs.	X	X	X	X	X		X	7.5 cfs	X										X	X					X	N
48	Riverside Corona Feeder	WMWD	Connect SWP feeder to Riverside; recharge Riverside County basins																		X	X					X	N
49	Confluence Regional Water Resources Project	CBWCD	The Confluence Regional Water Resources Project will construct a new groundwater recharge and storage reservoir at the confluence of Chino Creek and San Antonio Creek. Pumps will send excess stormwater to upstream CBWCD-managed basins to enhance recharge opportunities. The project will also include an artificial habitat and bioremediation channel as an educational and wetland habitat feature.	X	3.1E+13 MPN *E. coli*	1,830 afy	X	1,830 afy		X		1,830 afy				X	2.03 ac	2.03 ac	627 ft	2.03 ac	X	217 job-years	X	X		2.03 ac	$20,000,000	Y
50	Big Bear Valley Water Sustainability Project	City of Big Bear Lake	Big Bear Valley wastewater currently is treated and sent outside of the SARW to irrigate crops in Lucerne Valley. The Big Bear Valley Water Sustainability Project will upgrade the WWTP and reuse tertiary treated wastewater locally to recharge local groundwater, provide critical habitat for endangered species, and stabilize the water level at Big Bear Lake.	X	X		X		1,950 afy							X	145 ac	145 ac			X	478 job-years		X			$44,000,000	N
51	Rathbun Creek Floodway Improvement Project	City of Big Bear Lake	The Rathbun Creek Floodway Improvement Project will increase the size of three culverts to be able to convey the 100-year discharge without flooding nearby properties. The project will also enhance the natural streambed downstream of Big Bear Boulevard and enhance riparian habitat. A multiuse trail facility will also be constructed along the banks to extend Rathbun Trail all the way to Big Bear Lake.							X			up to 3.44 ft	1,504 parcels	$451 million	X	1.50 ac	2.04 ac	2,218 ft	3.54 ac	X	65 job-years	1 sign	X	3,500 ft	3.54 ac	$6,000,000	N
52	Treat, Recycle, Educate (TRE) Plan	City of Redlands	The TRE Plan consists of several green street improvements combined with a new 0.8-acre stormwater basin near the existing WWTP in the City of Redlands. The area will include a new educational park featuring interpretive signage describing the LID BMPs that will be included in the park and on Nevada Street. The park's vegetation will recycled water from the WWTP.	X	X	X	X	X	X	X	X	X				X				1.20 ac	X	22 job-years	6 signs	X	1,920 ft	0.40 ac	$2,000,000	N
53	Los Serranos Park	City of Chino Hills	The Los Serranos Park project will create a new community park in the City of Chino Hills. The design will include green infrastructure and habitat enhancement and protection.	X	X	X										X		X		X	X	43 job-years			X	X	$4,000,000	N
54	Restoration and Enhancement of Creeks	City of Chino Hills	This project will improve the ecosystem and protect valuable riparian habitat through a creek rehabilitation and streambed restoration project. The project will also provide public walking trails and educational opportunities.	X	X	X										X		X	X	X	X	8 job-years	X		X	X	$750,000	N

Units: ac = acre
afy = acre-feet per year
cfs = cubic feet per second
ft = feet
MPN = Most Probable Number

Notes: CBWCD = Chino Basin Water Conservation District
IEUA = Inland Empire Utilities Agency
SBC = San Bernardino County
SBCFCD = San Bernardino County Flood Control District
SBVMWD = San Bernardino Valley Municipal Water District
WMWD = Western Municipal Water District

Attachment H

Project Prioritization Results

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Results of Project Prioritization

Project Number	Project	Lead Agency	Concept Approved, or Project Ready?	Code: Project Readiness	Full Project Cost	Code: Cost Estimate	Have Benefits Been Quantified?	Code: Quantification	Number of Benefit Categories	Code: Benefit Categories	Water Supply Unit Cost ($/afy)	Code: Water Supply Cost	Water Quality Unit Cost ($/billion MPN)	Code: Water Quality Cost	Ranking Code	Ranked Order
49	Confluence Regional Water Resources Project	CBWCD	Y	1	$20,000,000	1	Y	1	5	1	$10,929	3	$643	4	111134	1
12	Plunge Creek Stream Bed Restoration and Elder Creek Channel Improvement	SBCFCD	Y	1	$7,477,000	1	Y	1	5	1	$93,463	4	$467	3	111143	2
5	Cable Creek Basin (Upper)	SBCFCD	Y	1	$20,000,000	1	Y	1	4	2	$23,283	3	$118	3	111233	3
16	West State Street Storm Drain Segment III and Brooks Basin Inlet Enhancement	SBCFCD	Y	1	$11,660,000	1	Y	1	4	2	$99,658	4	$2,159	6	111246	4
11	Cactus Basin #4 & 5	SBCFCD	Y	1	$28,000,000	1	Y	1	4	2	$164,706	5	$757	4	111254	5
3	Grove Basin Storm Drain	SBCFCD	Y	1	$10,000,000	1	Y	1	4	2	$163,934	5	$2,632	6	111256	6
4	Randall Basin Outlet and Colton Storm Drain Project 3-5	SBCFCD	Y	1	$10,000,000	1	Y	1	4	2	$175,439	5	$2,857	6	111256	6
1	Hawker Crawford Channel Storm Drain	SBCFCD	Y	1	$6,231,000	1	Y	1	4	2	$519,250	7	$2,596	6	111276	8
2	West Fontana Channel - Hickory Basin to Banana Basin	SBCFCD	Y	1	$10,000,000	1	Y	1	4	2		9	$7,692	7	111297	9
19	Santa Ana River Trail Phase IV	SBC Parks	Y	1	$10,000,000	1	Y	1	2	4		9		9	111499	10
18	Santa Ana River Trail Phase III	SBC Parks	Y	1	$3,786,000	1	Y	1	2	4		9		9	111499	10
10.1	Rialto Channel - Etiwanda to Willow - Concept 1	SBCFCD	N	2	$20,580,000	1	Y	1	5	1	$180,526	5	$823	4	211154	12
8	Mission Channel - Santa Ana River to Tennessee Street	SBCFCD	N	2	$8,190,000	1	Y	1	5	1	$160,588	5	$630	4	211154	12
6.1	Warm Creek - Baseline Street to Sand Creek Confluence - Concept 1	SBCFCD	N	2	$6,350,000	1	Y	1	5	1	$470,370	6	$454	3	211163	14
10.2	Rialto Channel - Etiwanda to Willow - Concept 2	SBCFCD	N	2	$13,098,000	1	Y	1	5	1	$396,909	6	$1,845	5	211165	15
13	Wildwood Channel - Interstate 10 to Holmes Street	SBCFCD	N	2	$16,670,920	1	Y	1	5	1	$438,708	6	$9,262	7	211167	16
9	Wilson Creek - 10th Street to Interstate 10	SBCFCD	N	2	$11,000,000	1	Y	1	5	1	$578,947	7	$1,250	5	211175	17
52	Treat, Recycle, Educate (TRE) Plan	City of Redlands	N	2	$2,000,000	1	Y	1	5	1		9		9	211199	18
28	Twin Creek Spreading Grounds	SBVMWD	N	2	$16,677,990	1	Y	1	4	2	$4,081	1	$28	1	211211	19

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Results of Project Prioritization

Project Number	Project	Lead Agency	Concept Approved, or Project Ready?	Code: Project Readiness	Full Project Cost	Code: Cost Estimate	Have Benefits Been Quantified?	Code: Quantification	Number of Benefit Categories	Code: Benefit Categories	Water Supply Unit Cost ($/afy)	Code: Water Supply Cost	Water Quality Unit Cost ($/billion MPN)	Code: Water Quality Cost	Ranking Code	Ranked Order
20	Lytle Creek Basin	SBVMWD	N	2	$14,685,038	1	Y	1	4	2	$3,650	1	$27	1	211211	19
26	Plunge Creek Basin I	SBVMWD	N	2	$10,900,345	1	Y	1	4	2	$4,394	1	$31	1	211211	19
32	San Sevaine Basins	IEUA	N	2	$3,550,000	1	Y	1	4	2	$1,391	1	$39	1	211211	19
25	Mill Creek Inlet	SBVMWD	N	2	$2,595,052	1	Y	1	4	2	$2,926	1	$14	1	211211	19
35	Victoria Basin	IEUA	N	2	$150,000	1	Y	1	4	2	$920	1	$25	1	211211	19
31	Wineville Recycled Pipeline Project	IEUA	N	2	$21,300,000	1	Y	1	4	2	$3,179	1	$152	3	211213	25
24	Lytle-Cajon Basins	SBVMWD	N	2	$10,668,323	1	Y	1	4	2	$3,130	1		9	211219	26
22	City Creek Basin	SBVMWD	N	2	$32,823,285	1	Y	1	4	2	$6,256	2	$44	1	211221	27
38	Montclair Basins	IEUA	N	2	$1,440,000	1	Y	1	4	2	$5,806	2	$41	1	211221	27
23	Cable Creek Basin (Lower)	SBVMWD	N	2	$24,520,683	1	Y	1	4	2	$8,234	2	$60	2	211222	29
21	Devil Canyon Basins	SBVMWD	N	2	$23,768,911	1	Y	1	4	2	$6,546	2	$64	2	211222	29
29	Vulcan 2 Basin	SBVMWD	N	2	$31,221,404	1	Y	1	4	2	$9,073	2		9	211229	31
30	Waterman Basins	SBVMWD	N	2	$10,207,218	1	Y	1	4	2	$6,094	2		9	211229	31
36	Turner Basin	IEUA	N	2	$890,000	1	Y	1	4	2	$13,485	3	$40	1	211231	33
7.2	Little Sand Creek - Concept 2	SBCFCD	N	2	$3,216,957	1	Y	1	4	2	$27,732	3	$60	2	211232	34
37	Ely Basins	IEUA	N	2	$3,200,000	1	Y	1	4	2	$14,480	3	$67	2	211232	34
34	Declez Basin	IEUA	N	2	$4,070,000	1	Y	1	4	2	$16,888	3	$370	3	211233	36
33	Lower Day Basin	IEUA	N	2	$2,480,000	1	Y	1	4	2	$33,067	3	$248	3	211233	36
50	Big Bear Valley Water Sustainability Project	City of Big Bear Lake	N	2	$44,000,000	1	Y	1	4	2	$22,564	3		9	211239	38

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Results of Project Prioritization

Project Number	Project	Lead Agency	Concept Approved, or Project Ready?	Code: Project Readiness	Full Project Cost	Code: Cost Estimate	Have Benefits Been Quantified?	Code: Quantification	Number of Benefit Categories	Code: Benefit Categories	Water Supply Unit Cost ($/afy)	Code: Water Supply Cost	Water Quality Unit Cost ($/billion MPN)	Code: Water Quality Cost	Ranking Code	Ranked Order
27	Plunge Creek Basin II	SBVMWD	N	2	$12,808,867	1	Y	1	4	2	$12,199	3		9	211239	38
14.1	Del Rosa Channel - Pacific Street to Del Rosa Avenue - Concept 1	SBCFCD	N	2	$7,878,445	1	Y	1	4	2	$656,537	7	$3,030	6	211276	40
14.2	Del Rosa Channel - Pacific Street to Del Rosa Avenue - Concept 2	SBCFCD	N	2	$2,930,297	1	Y	1	4	2	$586,059	7	$2,664	6	211276	40
17	Carbon Canyon Creek Channel - Pipeline Avenue to Peyton Drive	SBCFCD	N	2	$21,000,000	1	Y	1	4	2	$1,400,000	8	$6,563	7	211287	42
6.2	Warm Creek - Del Rosa Confluence to Sand Creek Confluence - Concept 2	SBCFCD	N	2	$26,126,325	1	Y	1	4	2		9	$706	4	211294	43
7.1	Little Sand Creek - Concept 1	SBCFCD	N	2	$6,825,600	1	Y	1	4	2		9	$4,550	6	211296	44
51	Rathbun Creek Floodway Improvement Project	City of Big Bear Lake	N	2	$6,000,000	1	Y	1	3	3		9		9	211399	45
53	Los Serranos Park	City of Chino Hills	N	2	$4,000,000	1	N	2	3	3		9		9	212399	46
15	Etiwanda Channel Invert Repair and Trail Project	SBCFCD	N	2	$1,500,000	1	N	2	3	3		9		9	212399	46
54	Restoration and Enhancement of Creeks	City of Chino Hills	N	2	$750,000	1	N	2	3	3		9		9	212399	46
41	Montclair - Sunset Park	CBWCD / Montclair	N	2	X	2	N	2	5	1		9		9	222199	49
42	Urban Walkable Watersheds	CBWCD	N	2	X	2	N	2	5	1		9		9	222199	49
45	Streamflow Restoration on Plunge Creek	SBVWCD	N	2	X	2	N	2	5	1		9		9	222199	49
46	Spreading on Woolly Star Preserve Area	SBVWCD	N	2	X	2	N	2	5	1		9		9	222199	49
39	Montclair - Arrow Highway	City of Montclair	N	2	X	2	N	2	4	2		9		9	222299	53
40	Montclair - Fremont Avenue	City of Montclair	N	2	X	2	N	2	4	2		9		9	222299	53
47	Mission/Zanja Basin	SBVWCD	N	2	X	2	N	2	4	2		9		9	222299	53
43	Multipurpose Recharge Basins	CBWCD	N	2	X	2	N	2	2	4		9		9	222499	56
44	College Heights and Upland Percolation Basins	CBWCD	N	2	X	2	N	2	2	4		9		9	222499	56

San Bernardino County
Santa Ana River Watershed
Storm Water Resource Plan

Results of Project Prioritization

Project Number	Project	Lead Agency	Concept Approved, or Project Ready?	Code: Project Readiness	Full Project Cost	Code: Cost Estimate	Have Benefits Been Quantified?	Code: Quantification	Number of Benefit Categories	Code: Benefit Categories	Water Supply Unit Cost ($/afy)	Code: Water Supply Cost	Water Quality Unit Cost ($/billion MPN)	Code: Water Quality Cost	Ranking Code	Ranked Order
48	Riverside Corona Feeder	WMWD	N	2	X	2	N	2	1	5		9		9	222599	58

Units: ac = acre
afy = acre-feet per year
cfs = cubic feet per second
ft = feet
MPN = Most Probable Number

Notes: CBWCD = Chino Basin Water Conservation District
IEUA = Inland Empire Utilities Agency
SBC = San Bernardino County
SBCFCD = San Bernardino County Flood Control District
SBVMWD = San Bernardino Valley Municipal Water District
WMWD = Western Municipal Water District

Codes:

Project readiness ----------
1 = approved or ready
2 = not approved or ready

Cost Estimate ----------
1 = cost estimate provided
2 = no cost estimate provided

Quantification ----------
1 = benefits have been quantified
2 = benefits have not been quantified

Benefit Categories ----------
1 = project provides benefits across 5 categories
2 = project provides benefits across 4 categories
3 = project provides benefits across 3 categories
4 = project provides benefits across 2 categories
5 = project provides benefits in one category

Water Supply Cost ----------
1 = unit cost of groundwater recharge is less than $5,000 per acre-foot per year
2 = unit cost of groundwater recharge is between $5,000 and $10,000 per acre-foot per year
3 = unit cost of groundwater recharge is between $10,000 and $50,000 per acre-foot per year
4 = unit cost of groundwater recharge is between $50,000 and $100,000 per acre-foot per year
5 = unit cost of groundwater recharge is between $100,000 and $200,000 per acre-foot per year
6 = unit cost of groundwater recharge is between $200,000 and $500,000 per acre-foot per year
7 = unit cost of groundwater recharge is between $500,000 and $1,000,000 per acre-foot per year
8 = unit cost of groundwater recharge is greater than $1,000,000 per acre-foot per year
9 = project provides no benefit to groundwater recharge, or benefits are unquantified

Water Quality Cost ----------
1 = unit cost of water quality improvement is less than $50 per billion *E. coli* bacteria removed
2 = unit cost of water quality improvement is between $50 and $100 per billion *E. coli* bacteria removed
3 = unit cost of water quality improvement is between $100 and $500 per billion *E. coli* bacteria removed
4 = unit cost of water quality improvement is between $500 and $1,000 per billion *E. coli* bacteria removed
5 = unit cost of water quality improvement is between $1,000 and $2,000 per billion *E. coli* bacteria removed
6 = unit cost of water quality improvement is between $2,000 and $5,000 per billion *E. coli* bacteria removed
7 = unit cost of water quality improvement is between $5,000 and $10,000 per billion *E. coli* bacteria removed
8 = unit cost of water quality improvement is greater than $10,000 per billion *E. coli* bacteria removed
9 = project provides no water quality benefit, or benefits are unquantified

Attachment I

Funding Matrix

Summary of Potential Funding Sources for SWRP Projects

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
Grants							
California Climate Investments	Urban Greening Program	Round 2 Solicitation now closed. Schedule for future solicitations unknown	Funding of projects that reduce greenhouse gases by sequestering carbon, decreasing energy consumption and reducing vehicle miles traveled, while also transforming the built environment into places that are more sustainable, enjoyable, and effective in creating healthy and vibrant communities	➢ Establishment, enhancement, and expansion of neighborhood parks and community spaces ➢ Greening of public lands and structures, which may include incorporation of riparian habitat for water capture ➢ Green streets and alleyways ➢ Non-motorizes urban trails ➢ Urban heat island mitigation	None	California Natural Resources Agency (916) 653-2812 urbangreening@resources.ca.gov	UGP
California Department of Parks and Recreation	Habitat Conservation Fund	Continuous; application must be submitted by first work day of October	Protecting, restoring, and enhancing wildlife habitat and fisheries	➢ Enhancement or restoration of wetlands ➢ Enhancement or restoration of riparian habitat	No minimum or maximum amounts (2,000,000 total available each year) Requires 50% match	Barbara Baker Habitat Conservation Fund Program (916) 6511-7743 Barbara.Baker@parks.ca.gov	HCF
California Department of Parks and Recreation	Land and Water Conservation Fund (LWCF)	Continuous Next cycle in 2020	To provide for the health, inspiration, and education of the people of California by helping to preserve the State's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation	➢ Acquisition and development projects to create outdoor recreational resources	$3,000,000 maximum	Luan Aubin (916) 651-8573 Luan.Aubin@parks.ca.gov Richard Rendon (916) 651-7600 richard.rendon@parks.ca.gov	LWCF
California Department of Parks and Recreation	Outdoor Environmental Educational Facilities	Schedule for future solicitations unknown	To provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation	➢ Development of public outdoor structures and exhibits that facilitate focused learning ➢ Focused learning must take place in a natural outdoor setting, with native vegetation ➢ Learning must encompass the natural environment, and inspire environmental stewardship and an appreciation of the natural world ➢ Learning must include an understanding of how humans interact with, and are dependent on, natural ecosystems ➢ Structures and exhibits may provide outdoor education on their own (such as signs, kiosks, nature trails), or facilitate providing outdoor education (such as campfire centers, amphitheaters, group campgrounds)	Up to $500,000; Match funds optional (5/100 possible points with applicant paying all non-construction costs	Luan Aubin (916) 651-8573 Luan.Aubin@parks.ca.gov	OEEF

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
California Department of Parks and Recreation	Recreational Trails Program	Schedule for future solicitations are unknown at this time (anticipated 2019)	Provides funds annually for recreational trails and trails-related projects	➢ Provides funds annually for recreational trails and trails-related projects	12% minimum match requirement	Luan Aubin San Bernardino Project Officer Office of Grants and Local Services State of California Department of Parks and Recreation Luan.Aubin@parks.ca.gov (916) 651-8573	RTP
California Department of Parks and Recreation	Statewide Park Program (Proposition 68)	Final application guide to be published by January 2019; applications due Summer 2019	Creates new parks and new recreation opportunities in critically underserved communities across California	➢ Development of a new park ➢ Expansion of an existing park ➢ Renovation of an existing park ➢ Acquisition of land to develop a park ➢ Each project must create or renovate at least one recreation feature (dog parks, athletic fields, trails, etc.)	$200,000 to $8,500,000; no match requirement	Luan Aubin San Bernardino Project Officer Office of Grants and Local Services State of California Department of Parks and Recreation Luan.Aubin@parks.ca.gov (916) 651-8573	SPP
California Department of Water Resources	Local Levee Assistance Program	Continuous (Last cycle: 2014-2016)	Provide financial assistance to local public agencies responsible for flood management outside the Sacramento-San Joaquin Delta	➢ Fund repair of local flood control facilities critically damaged by erosion, levees with unstable slopes, and other unstable facilities ➢ Geotechnical exploration of existing local levees and evaluation of the data for stability, seepage, and underseepage deficiencies	Not stated	Patrick Luzuriaga Chief, Local Assistance Section A Division of Flood Management (916) 574-0932 Patrick.Luzuriaga@waterboard.ca.gov	LLAP
California Department of Water Resources	Flood Control Subventions Program	Schedule for future solicitations are unknown at this time	Provide financial assistance to local agencies cooperating in the construction of federally authorized flood control projects	➢ Funds major flood control projects ➢ Funds small flood control projects ➢ Watershed protection projects	Cost share ranging between 50% and 70%	Patrick Luzuriaga Chief, Local Assistance Section A Division of Flood Management (916) 574-0932 Patrick.Luzuriaga@waterboard.ca.gov	FCSP
California Department of Water Resources	Flood Corridor Program	Schedule for future solicitations are unknown at this time	Provide funding for primarily nonstructural flood management solutions	➢ Wildlife habitat enhancement ➢ Agricultural land preservation	No funding left in program at this time	Patrick Luzuriaga Chief, Local Assistance Section A Division of Flood Management (916) 574-0932 Patrick.Luzuriaga@waterboard.ca.gov	FCP
California Department of Water Resources	Integrated Regional Water Management (IRWM) Grant (Proposition 1)	Applicant must have been involved in IRWM planning process (collaboration may be required); Round 1 Grant Applications Due to DWR anticipated April 2019	To encourage integrated regional strategies for management of water resources and to provide funding for implementation projects that support integrated water management	➢ Water supply reliability, water conservation, and water use efficiency ➢ Stormwater capture, storage, clean-up, treatment, and management ➢ Non-point source pollution reduction, management, and monitoring ➢ Groundwater recharge and management projects ➢ Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users	Minimum 50% cost share	Zaffar Eusuff (916) 651-9266 Muzaffar.eusuff@water.ca.gov Ted Daum (916) 651-9264 Theodore.Daum@water.ca.gov	IRWM

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
California Department of Water Resources	Urban Streams Restoration Program	Continuous, Draft guidelines anticipated in Spring 2019	To reduce flooding and erosion and associated property damage; restore, enhance or protect the natural ecological values of streams; and promote community involvement, education and stewardship	➢ Projects that restore environmental and recreational benefits to streams previously channelized for flood control are eligible ➢ Projects that include removing the concrete and re-establishing the natural stream meander and floodplain topography ➢ Flood management, erosion control, or environmental restoration are the main objective, but may include some trail work	$1000-$1,000,000; no match requirement	Stefan Lorenzato Program Manager (916) 651-9617 Stefan.Lorenzato@water.ca.gov Marc Commandatore (916) 651-9630	USRP USRP Grants
California Department of Water Resources	Water-Energy Grant Program	Continuous, schedule for solicitation unknown at this time	To implement water efficiency programs or projects that reduce greenhouse gas emissions, and reduce water and energy use	➢ Commercial or institutional water-energy efficiency programs or projects ➢ Residential water-energy efficiency programs or projects benefiting Disadvantaged Communities (DACs) ➢ Proposal must demonstrate that it will directly reduce GHG emissions and also reduce water and energy use	$3,000,000	(916) 651-9613 DWR_IRWM@water.ca.gov Matt Botill (Branch Chief, CA Climate Investments) (916) 324-0934 Matthew.Botill@arb.ca.gov	WEGP
California Natural Resources Agency	Environmental Enhancement and Mitigation Program	Next solicitation in April 2019	Funding projects to mitigate, either directly or indirectly, the environmental impacts of the modification of an existing transportation facility or the environmental impacts of the construction of a new transportation facility	➢ Urban forestry to offset vehicular emissions of carbon dioxide ➢ Resource lands for acquisition or enhancement of resource lands ➢ Mitigation Projects Beyond the Scope of the Lead Agency	Maximum $1,000,000 for acquisitions, $500,000 for development projects	California Natural Resources Agency (916) 653-2812 eemcoordinator@resources.ca.gov Carol Carter carol.carter@resources.ca.gov	EEMP
California Natural Resources Agency	California River Parkways Grant Program (Proposition 68)	Continuous; Concept Proposals August 15, 2018 – September 27, 2018	To protect and manage the State's natural, historical, and cultural resources	➢ Funding for projects that involve natural creeks, streams, and/or rivers. Projects must meet at least two of the following five statutory objectives: ▪ Recreation- provide compatible recreational opportunities, including trails for strolling, hiking, bicycling, and equestrian uses along rivers and streams ▪ Habitat- protect, improve, or restore riverine or riparian habitat, including benefits to wildlife habitat and water quality ▪ Flood management- maintain or restore the open space character of lands along rivers and streams so that they are compatible with periodic flooding as part of a flood management plan or project ▪ Conversion to river parkways- convert existing developed riverfront land into uses consistent with river parkways ▪ Conservation and interpretive enhancement- provide facilities to support or interpret river or stream restoration or other conservation activities	No minimum or maximum grant amounts	(916) 653-2812 urban.rivers@resources.ca.gov	CURGP CURGP

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
California State Coastal Conservancy	Proposition 1	Continuous; RFP in Winter 2018-2019 Applications due Spring 2019	To work proactively with local communities to implement multi-benefit projects that protect and enhance coastal resources	➢ Implement watershed adaptation projects in order to reduce the impacts of climate change on communities and ecosystems ➢ Restore river parkways throughout the state, including but not limited to projects pursuant to the California River Parkways Act of 2004 and urban river greenways ➢ Protect and restore rural and urban watershed health to improve watershed storage capacity, forest health, protection of life and property, storm water resource management, and greenhouse gas reduction ➢ Protect and restore coastal watersheds including but not limited to, bays, marine estuaries, and near shore ecosystems ➢ Reduce pollution or contamination of rivers, lakes, streams, or coastal waters, prevent and remediate mercury contamination from legacy mines, and protect or restore natural system functions that contribute to water supply, water quality, or flood management ➢ Assist in the recovery of endangered, threatened, or migratory species by improving watershed health, instream flows, fish passage, coastal or inland wetland restoration, or other means, such as natural community conservation plan and habitat conservation plan implementation	No minimum or maximum amount	Mary Small mary.small@scc.ca.gov (510) 285-4181	CSCC Prop 1
California State Water Resources Control Board (SWRCB)	Cleanup and Abatement Account (CAA)	Continuous; schedule for solicitation unknown at this time	To provide public agencies with grants for the cleanup or abatement of a condition of pollution when there are no viable responsible parties available to undertake the work	➢ Emergency Cleanup Projects – Public Safety ➢ Projects that address Disadvantaged Communities Environmental Justice infrastructure needs ➢ Cleanup and/or abatement of 2006-listed water bodies that will help to implement a Total Maximum Daily Load (TMDL) ➢ Cleanup and/or abatement of non-point source legacy pollutants (i.e. stormwater) when the source(s) of the pollution have been mitigated ➢ Cleanup and/or abatement of pollution in high-use groundwater basins ➢ Cleanup and/or abatement of contaminated sites when the viable responsible party has not been identified ➢ Projects that promote habitat restoration through non-profit organizations that collaborate with the Regional Water Boards and encourage public outreach and education ➢ Completion of a study/plan and/or monitoring addressing significant Statewide water quality problems	Division of Financial Assistance allows requests for up to $250,000 Projects more than $250,000 will require approval from the SWRCB.	Kim Hanagan Senior WRCE (916) 323-0624	CAA
California State Water Resources Control Board (SWRCB)	Orphan Site Cleanup Fund (OSCF)	Continuous	Provides financial assistance to eligible applicants for the cleanup of sites contaminated by leaking petroleum underground storage tanks (USTs) where there is no financially responsible party, and the applicant is not an eligible claimant to the UST Cleanup Fund	➢ Assessment: preliminary site assessment and soil and water investigation and the preparation of a corrective action plan in accordance with California Code of Regulations, Title 23, Chapter 16, Article 11 ➢ Cleanup: Provide funding for response actions that carry out cleanup activities and include implementing a corrective action plan and verification monitoring, in accordance with California Code of Regulations, Title 23, Chapter 16, Article 11	Maximum $1,000,000	Lola Barba Manager (916) 341-5009 lola.barba@waterboards.ca.gov	OSCF

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
California State Water Resources Control Board (SWRCB)	Multi-benefit Stormwater Management Projects	Solicitation of Round 2 grants for implementation begins mid 2019	Improve regional water self-reliance, security and adapt to the effects on water supply arising from climate change	➢ Multi-benefit storm water management projects which may include, but shall not be limited to, green infrastructure, rainwater and storm water capture projects and storm water treatment facilities	$250,000 to $10,000,000 from Prop 1 Grants Requiring 50% match	Daman Badyal Damanvir.Badyal@waterboards.ca.gov (916) 319-9436	SWGP
California State Water Resources Control Board (SWRCB)	Site Cleanup Subaccount Program (SCAP)	Continuous Pre-Application process – no deadlines	To issue grants for projects that remediate the harm or threat of harm to human health, safety, or the environment caused by existing or threatened surface water or groundwater contamination	➢ Remediate the harm or threat of harm to human health, safety, and the environment from surface water or groundwater contamination ➢ Human-made contaminants ➢ A regulatory agency has issued a directive (unless this is infeasible) ➢ Responsible party lacks financial resources ➢ Projects may include site characterization, source identification, or implementation of cleanup	No limits or match requirements	gwquality.funding@waterboards.ca.gov Subject Line: SCAP Phone: (800) 813-FUND (3863) Diane Barclay diane.barclay@waterboards.ca.gov (916) 341-5797	SCAP
California State Water Resources Control Board (SWRCB)	Small Community Wastewater Program - Small Community Grant Fund	Continuous; Project must be submitted to project list for CWSRF (Clean Water State Revolving Fund) financing	To preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations	➢ Planning, design, construction, of publicly-owned wastewater conveyance, treatment, and disposal facilities ➢ Wastewater planning: feasibility/engineering studies, environmental studies, rate studies	Up to $8,000,000, 75% share	Jennifer Toney Senior Water Resource Control Engineer Division of Financial Assistance Small Community Wastewater Unit (916) 319-8246 Wennilyn Fua wennilyn.fua@waterboards.ca.gov (916) 322-1026	SCWP
California State Water Resources Control Board (SWRCB)	Sustainable Groundwater Planning (SGWP) Grant Program - Prop 1	Schedule for future solicitations are unknown at this time	To encourage sustainable management of groundwater resources that support the Sustainable Groundwater Management Act (SGMA); This PSP is making a total of approximately $86.3 million available, with at least $10 million made available to projects that serve Severely Disadvantaged Communities (SDACs)	➢ Category 1 projects serve Severely Disadvantaged Communities (SDACs) and Category 2 projects are related to the development of Groundwater Sustainability Plans (GSPs) for critically over drafted basins and high/medium priority basins ➢ Category 1 and Category 2 projects must address a DWR Bulletin 118 (2016) basin or a non-adjudicated portion of a basin that are designated by DWR as high or medium priority basins ➢ Category 2 projects located in basins determined to be probationary under SGMA by SWRCB or projects identified in an Alternative Plan are not eligible	Up to $1,000,000; 50% share	Zaffar Eusuff Muzaffar.Eusuff@water.ca.gov (916) 651-9266	SGWP

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
California State Water Resources Control Board (SWRCB)	Urban Storage Tank Cleanup Fund (USTCF)	Continuous; schedule for solicitation unknown at this time	To contribute to the protection of California's public health, and water quality through (1) establishing an alternative mechanism to meet Financial Responsibility requirements for owners and operators of petroleum USTs, and (2) reimbursing eligible corrective action costs incurred in the cleanup of contamination resulting from the unauthorized release of petroleum from USTs	➢ Projects that abate emergency situations or cleanup abandoned sites that pose a threat to human health, safety, and the environment, as a result of a UST petroleum release	Up to $14,000,000 (small business)	State Water Resources Control Board Division of Financial Assistance Underground Storage Tank Cleanup Fund P.O. Box 944212 Sacramento, CA 94244-2120 (800) 813-FUND	USTCF
California State Water Resources Control Board (SWRCB)	Water Recycling Fund Program	Continuous	To assist agencies or regions with completing planning studies for water recycling projects using treated municipal wastewater and/or treated groundwater from sources contaminated by human activities	➢ Groundwater Recharge Facilities (when associated with protection of groundwater quality) that demonstrate multiple benefits by using recycled water to improve groundwater quality and supply, and/or provide public health benefits from improved water quality and supply	Planning: Maximum $75,000, 50% share Construction: Maximum $15,000,000, 35% share	Michael Downey Senior Water Resources Control Engineer (916) 324-8404 Michael.Downey@waterboards.ca.gov	WRFP
California Transportation Commission (CTC)	Active Transportation Program	Continuous; Cycle 4 applications were due July 31, 2018	To encourage increased use of active modes of transportation, such as biking and walking	➢ Infrastructure Projects: Capital improvements that will further the goals of this program. This typically includes the environmental, design, right-of-way, and construction phases of a capital (facilities) project ➢ Plans: The development of a community wide bicycle, pedestrian, safe routes to school, or active transportation plan in a disadvantaged community ➢ Non-infrastructure (NI) Projects: Education, encouragement, and enforcement activities that further the goals of the ATP	No limits; match requirements vary by source of ATP funding, whether from federal or state sources. See guidelines for details.	Laurie Waters Laurie.Waters@dot.ca.gov (916) 651-6145	ATP ATP Guide

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
Federal Emergency Management Agency	Flood Mitigation Assistance (FMA) Program	Application cycle October 1, 2018 to January 31, 2019	Reducing or eliminating claims under the National Flood Insurance Program (NFIP). Funds provided for projects and planning to reduce or eliminate long-term risk of flood damage to structures insured under the NFIP.	➢ Floodwater storage and diversion ➢ Stormwater management ➢ Wetland restoration/creation ➢ Localized flood control to protect critical facility ➢ Floodplain and stream restoration	Up to $100,000 for community flood mitigation advance assistance Up to $10,000,000 for community flood mitigation projects $100,000 per Applicant for mitigation planning with a maximum of $50,000 for state plans and $25,000 for local plans	FEMA Department of Homeland Security 500 C Street, S.W. Washington, DC 20472	FMA
Federal Emergency Management Agency	Hazard Mitigation Grant Program (HMGP)	Continuous; schedule for solicitation unknown at this time	To help communities implement hazard mitigation measures following a Presidential Major Disaster Declaration in the areas of the state, tribe, or territory requested by the Governor or Tribal Executive.	➢ Mitigating flood and drought conditions – aquifer storage and recovery ➢ Floodplain and stream restoration ➢ Flood diversion and storage ➢ Green infrastructure methods	Up to 75% of project	FEMA Department of Homeland Security 500 C Street, S.W. Washington, DC 20472 Jennifer L. Hogan California Governor's Office of Emergency Services 3650 Shriever Avenue Mather, CA 95655 (916) 845-8205 jennifer.hogan@caloes.ca.gov	HMGP HMGP
Federal Emergency Management Agency	Pre-Disaster Mitigation (PDM) Grant Program	Continuous; application cycle October 1, 2018 to January 31, 2019	To reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters.	➢ CRMA and pre- or post-wildfire mitigation activities or any mitigation action that utilizes green infrastructure approaches ➢ Projects to reduce risk to structures or infrastructure from erosion and landslides, including installing geotextiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring ➢ FEMA encourages mitigation projects that fall into the Miscellaneous/Other category to address climate change adaptation and resiliency ➢ Mitigation projects must adapt to new challenges posed by more powerful storms, frequent heavy precipitation, heat waves, prolonged droughts, extreme flooding, higher sea levels, and other weather events	Up to 75% of project, 90% if small, impoverished community or tribe	FEMA Department of Homeland Security 500 C Street, S.W. Washington, DC 20472	PDM PDM
Federal Transit Administration (FTA)	Enhanced Mobility of Seniors and Individuals with Disabilities	Continuous; schedule for solicitation unknown at this time	To improve mobility for seniors and individuals with disabilities by removing barriers to transportation service and expanding transportation mobility options	➢ Building an accessible path to a bus stop, including curb-cuts, sidewalks, accessible pedestrian signals or other accessible features ➢ Mobility management programs	Administration/ planning: 100% Capital costs: 80% Operating assistance costs: 50%	Office of Program Management Federal Transit Administration 1200 New Jersey Avenue, S.E. Washington, DC 20590 (202) 366-2053	EMSID EMSID

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
Federal Transit Administration (FTA)	Flexible Funding Program: Congestion Mitigation & Air Quality Program (CMAQ)	Continuous	To provide a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas)	➢ Funds may be used for a transportation project or program that is likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution, and that is included in the metropolitan planning organization's (MPO's) current transportation plan and transportation improvement program (TIP) or the current state transportation improvement program (STIP) in areas without an MPO ➢ Project must: must be a transportation project, must generate an emissions reduction and must be located in or benefit a nonattainment or maintenance area	80% Federal share, 100% for special projects	Mark Glaze mark.glaze@dot.gov	CMAQ
Federal Transit Administration (FTA)	Flexible Funding Program: Surface Transportation Block Grant (STBG)	Continuous	To preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals	➢ Recreational trails projects, pedestrian and bicycle projects ➢ Environmental restoration and pollution abatement to minimize or mitigate impacts of any transportation project funded under this title (including retrofitting and construction of stormwater treatment systems to meet Federal and State requirements under sections 401 and 402 of the Federal Water Pollution Control Act ➢ Establishment of plants selected by State and local transportation authorities to perform one or more of the following functions: abatement of stormwater runoff, stabilization of soil, and aesthetic enhancement	Up to 80% Federal share,	David Bartz Office of Program Administration (512) 536-5906 david.bartz@dot.gov	STBG FHWA STBG FTA
Federal Transit Administration (FTA)	Pilot Program for Transit-Oriented Development Planning	Continuous; last cycle 2016	To improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access for pedestrian and bicycle traffic, engage the private sector, identify infrastructure needs, and enable mixed-use development near transit stations	➢ Enhance economic development and ridership ➢ Facilitate multimodal connectivity and accessibility ➢ Increase non-motorized access to transit hubs ➢ Enable mixed-use development ➢ Identify infrastructure needs associated with the transit project ➢ Include private sector participation	$250,000 - $2,000,000, Maximum Federal share 80%	Ben Owen FTA Office of Planning and Environment (202) 366-5602 benjamin.owen@dot.gov	PPTODP

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
Federal Transit Administration (FTA)	Urbanized Area Formula Grant	Continuous	FTA apportions Urbanized Area Formula Program funds to urbanized areas (UZAs) and to states for public transportation capital projects, operating assistance, job access and reverse commute projects, and for transportation-related planning	➢ Planning, engineering, design and evaluation of transit projects and other technical transportation-related studies ➢ Capital investments in bus and bus-related activities such as replacement of buses, overhaul of buses, rebuilding of buses, crime prevention and security equipment and construction of maintenance and passenger facilities ➢ Capital investments in new and existing fixed guideway systems including rolling stock, overhaul and rebuilding of vehicles, track, signals, communications, and computer hardware and software ➢ Provide access for bicycles to public transportation facilities ➢ Provide shelters and parking facilities for bicycles in or around public transportation facilities	80% Federal share, 90% if project involves vehicle-related equipment costs attributable to compliance with the Americans with Disabilities Act (ADA) and Clean Air Act 50% for Operating Assistance costs Funds are available the year appropriated plus five years	Office of Program Management Federal Transit Administration 1200 New Jersey Avenue, S.E. Washington, DC 20590 United States (202) 366-2053	UAFG
National Endowment for the Arts	Our Town Grant	Schedule for future solicitations are unknown at this time	To support creative place making projects that help to transform communities into lively, beautiful, and resilient places with the arts at their core	➢ Design projects that demonstrate artistic excellence while supporting the development of places where creative activities occur, or where the identity of place is created or reinforced ➢ Design of public spaces, e.g., parks, plazas, landscapes, neighborhoods, districts, infrastructure, bridges, and artist-produced elements of streetscapes ➢ Design of cultural facilities – new or adaptive reuse	$25,000-$200,000 in matching grants for Arts Engagement, Cultural Planning, and Design Projects $25,000-$100,000 in Matching Grants for Projects that Build Knowledge About Creative Placemaking	NEA Staff OT@arts.gov	NEA
National Fish and Wildlife Foundation	Environmental Solutions for Communities Grant Program	Applicant must be a nonprofit organization (collaboration required); schedule for future solicitations are unknown at this time	To promote sustainable communities by supporting projects that link economic development and community well-being to the stewardship and health of the environment	➢ Demonstration projects that showcase innovative, cost-effective and environmentally-friendly approaches to improve environmental conditions within urban communities by 'greening' traditional infrastructure and public projects such as stormwater management and flood control and renovations to public facilities ➢ Projects that provide measurable and meaningful conservation/environmental outcomes	$25,000-$100,000	Sarah McIntosh Coordinator sarah.mcintosh@nfwf.org (202) 595-2434 Carrie Clingan Program Director, Community Stewardship and Youth (202) 595-2471 carrie.clingan@nfwf.org	NFWF

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
National Fish and Wildlife Foundation	Five Star & Urban Waters Restoration Grant Program	Annual; 2019 proposals due January 31, 2019	To develop community capacity to sustain local natural resources for future generations by providing modest financial assistance to diverse local partnerships focused on improving water quality, watersheds and the species and habitats they support.	➢ Restore and/or create wetlands, coastal or riparian areas ➢ Integrate meaningful outreach, education and/or training into the proposed on-the-ground activities that advance local watershed and conservation goals ➢ Involve five or more partners (public and private entities) including the applicant ➢ Result in specific, measurable ecological, educational and community benefits ➢ Include a plan for maintenance and care of the project beyond the grant period	$20,000 to $50,000 is a typical range: minimum 1:1 non-federal match	Danny Bowater (All Geographies) Coordinator, Community-Based Conservation (202) 595-2434 Daniel.Bowater@nfwf.org Easy Grants Helpdesk Easygrants@nfwf.org Voicemail: (202) 595-2497 Hours: M-F 9am-5pm ET Include: Name, Proposal ID#, email, phone number, program applied and issue	FSUWR
Ocean Protection Council	Proposition 1	Solicitation anticipated in July 2019	To preserve, protect, and restore the resources of the California coast	➢ Reduce pollution and contaminants, including nutrients, toxics, and contaminants of emerging concern from sources including stormwater, non-point discharges, agricultural runoff, etc. ➢ Prevent land-based litter from reaching the ocean and becoming marine debris ➢ Remove micro-plastics and microfibers from agricultural runoff and stormwater	Minimum $250,000	Marina Cazorla, Program Manager OPC_Prop1grants@resources.ca.gov	OPC Prop 1 OPC Prop 1
People For Bikes	Community Grant Program	1-2 cycles per year, Fall 2018 grant cycle closed to new applications October 2019 for 2019 grant schedule	To provide funding for important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S	➢ Bike paths, lanes, trails, and bridges ➢ Mountain bike facilities ➢ Bike parks and pump tracks ➢ BMX facilities ➢ End-of-trip facilities such as bike racks, bike parking, bike repair stations and bike storage ➢ Programs that transform city streets, such as Ciclovías or Open Streets Days ➢ Campaigns to increase the investment in bicycle infrastructure	Maximum $10,000, 50% share	Zoe Kircos Director of Grants and Partnerships (303) 449-4893 x106 zoe@peopleforbikes.org	CGP CGP
Rails to Trails Conservancy	Doppelt Family Trail Development Fund	Annual, applications due each January	To support organizations and local governments that are implementing projects to build and improve multi-use trails	➢ New trail construction, trail facility/infrastructure (e.g., trailheads, bathrooms) ➢ Land acquisition ➢ Trail signage ➢ Improvements to existing trails and significant maintenance tasks ➢ Promoting a local trail project in the local media ➢ Conducting feasibility studies ➢ Adding personnel or volunteer coordination capacity	$5,000-$50,000	grants@railstotrails.org	DFTDF
San Bernardino County Transportation Authority	Measure I	Continuous	Measure I is the half-cent sales tax collected throughout San Bernardino County for transportation improvements	➢ Major Street Projects - defined as congestion relief and safety improvements to major streets that connect communities, serve major destinations, and provide freeway access ➢ Local Street Projects - defined as local street and road construction, repair, maintenance and other eligible local transportation priorities	Not Stated Limits depend on tax revenue and region within county	Andrea Zureick Director Fund Administration and Programming azureick@gosbcta.com (909) 884-8276	SBCTA

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
State of California Wildlife Conservation Board	Habitat Restoration Grant	Continuous	Awards grants for projects to restore and enhance wildlife habitats	➢ Riparian habitat conservation ➢ Inland wetlands conservation ➢ Ecosystem restoration on agricultural lands ➢ Habitat enhancement and restoration	Not Stated	John P. Donnelly, Executive Director, Wildlife Conservation Board 1416 9th Street, Room 1266 Sacramento, CA, 95814	HRG
Surdna Foundation	Surdna Foundation Grant	Applicant must be a nonprofit organization (collaboration required); letters of inquiry are accepted on a rolling basis	To foster sustainable communities in the United States, communities guided by principles of social justice and distinguished by healthy environments, strong local economies, and thriving cultures	➢ Clean, affordable, equitable, high-quality and efficient transportation and land use development that better connects critical services, jobs, schools, housing and other regional destinations ➢ Efforts to help people make homes, businesses and other buildings more energy efficient ➢ Efforts to capture stormwater and slowly release it into the existing network of drains, or reuse it where it falls to cultivate natural green spaces	Indirect costs for program grants up to 15% of project expenses allowed for grants of $25,000 or more	Grants Manager, Surdna Foundation 330 Madison Ave., 30th Floor New York, NY 10010 grants@surdna.org	Surdna
United States Army Corp of Engineers	Small Flood Damage Reduction Projects	Continuous	To study, design, and construct small flood control projects in partnership with non-Federal government agencies, such as cities, counties, special authorities, or units of state government	➢ Projects may be structural (i.e., levees, flood walls, diversion channels, pumping plants and bridge modifications) or non-structural (i.e., flood proofing, relocation of structures and flood warning systems)	Feasibility Study: 100% up to $100,000 - 50/50 cost-share above that Design/ Construction: 65%	Chris Hatfield of the Special Studies Section (978) 318-8520	SFDRP
United States Army Corp of Engineers	Emergency Watershed Protection	Continuous	To help people and conserve natural resources by relieving imminent hazards to life and property caused by floods, fires, windstorms, and other natural occurrences	➢ Remove debris from stream channels, road culverts, and bridges ➢ Reshape and protect eroded and unstable banks ➢ Correct damaged drainage facilities ➢ Establish cover on critically eroding lands ➢ Repair levees and structures ➢ Repair conservation practices	Up to 75% of construction costs, 90% in limited resource areas	Shawn Anderson National Emergency Watershed Protection Program Coordinator (202) 720-5795	EWP EWP
United States Department of the Interior (DOI) - Bureau of Reclamation	Drought Response Program: Drought Resiliency Projects	Future cycles unknown at this time	To help communities prepare for and respond to drought	➢ Groundwater recharge and benefits for fish and wildlife Implement projects that support proactive approach to drought control Improving Water Management Update comprehensive drought plans with resiliency projects	Applicants must provide a 50 percent non-Federal cost-share. Award Ceiling: $750,000	Darion Mayhorn Reclamation Drought Coordinator dmayhorn@usbr.gov (303) 445-3121	DRP
U.S. Department of the Interior (DOI) - Bureau of Reclamation	Cooperative Watershed Management Program: Phase II	Continuous	Provides financial assistance to locally led watershed groups to encourage diverse stakeholders to form local solutions to water management needs	➢ Implementation of on-the-ground watershed management projects that address critical water supply needs, water quality, and ecological resilience of the watershed	For Phase II Reclamation will award up to $100,000 per project over a two-year period. Applicants must contribute at least 50% of the total project costs	Avra Morgan aomorgan@usbr.gov (303) 445-2906	CWMP

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
United States Department of the Interior (DOI) -National Park Service	Land & Water Conservation Fund	Continuous; next competitive cycle 2020 at the earliest	To stimulate a nationwide action program to assist in preserving, developing, and assuring to all citizens of the United States of present and future generations such quality and quantity of outdoor recreation resources as may be available and are necessary and desirable for individual active participation	➢ Development of picnic areas, sports and playfields, trails, swimming facilities, boating facilities, fishing/hunting facilities, winter sport facilities, camping facilities, exhibit facilities, spectator facilities, community gardens, etc. ➢ Protects and preserves older national parks, forests, wildlife refuges, and recreation areas	50% matching grants Funding range: $15,000 - $2,000,000,	lwcf.grants@nps.gov Director CA Department of Parks and Recreation P.O. Box 942896 Sacramento, CA 94296 (916) 653-8380	LWCF LWCF
United States Department of Transportation (DOT)	Better Utilizing Investments to Leverage Development (BUILD) program	Annually	DOT investment in road, rail, transit and port projects that promise to achieve national objectives	➢ Road or bridge projects eligible under title 23, United States Code ➢ Public transportation projects eligible under chapter 53 of title 49, United States Code; ➢ Passenger and freight rail transportation projects; ➢ Port infrastructure investments (including inland port infrastructure and land ports of entry); ➢ Intermodal projects	Urban: minimum $6,250,000 for match Rural: minimum $1,000,000 All projects: Maximum $25,000,000 Urban: up to 80% Rural: up to 100%	Office of Infrastructure Finance and Innovation Office of the Secretary of Transportation BUILDgrants@dot.gov (202) 366-0301	BUILD
United States Department of Transportation Federal Highway Association (FHWA)	Recreational Trails Program	Continuous	To develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses	➢ Maintenance and restoration of existing recreational trails ➢ Development and rehabilitation of trailside and trailhead facilities and trail linkages for recreational trails ➢ Purchase and lease of recreational trail construction and maintenance equipment ➢ Construction of new recreational trails (with restrictions for new trails on Federal lands) ➢ Acquisition of easements and property for recreational trails or recreational trail corridors ➢ Assessment of trail conditions for accessibility and maintenance ➢ Development and dissemination of publications and operation of educational programs to promote safety and environmental protection related to the use of recreational trails, including supporting non-law enforcement trail safety and trail use monitoring patrol programs, and providing trail-related training ➢ State costs incurred in administering the program	Varies by state, Federal limit up to 80% share	Richard Rendón, State Trail Administrator Office of Grants and Local Services California State Parks (916) 651-7600 richard.rendon@parks.ca.gov	RTP
United States Economic Development Administration (EDA)	Public Works & Development Facilities Programs	Proposals accepted on a rolling basis	To provide economically distressed communities and regions with comprehensive and flexible resources to address a wide variety of economic needs, and are designed to lead to the creation and retention of jobs and increased private investment	➢ Increase economic resiliency, including resilience to the effects of natural disasters and climate change ➢ Assist with natural disaster mitigation and recovery ➢ Aimed at restoring or improving urban waters and the communities that surround them ➢ Promote job creation and economic prosperity through enhancing environmental quality and developing and implementing green products, processes, places, and buildings as part of the green economy	$100,000 - $3,000,000 Typically 50% Federal share	Wilfred Marshall Wmarshall@eda.gov (310) 348-5386	PWDFP

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
United States Environmental Protection Agency (USEPA)	Urban Waters Small Grant	Last cycle 2016; Schedule for future solicitations are unknown at this time	To help local residents and their organizations, particularly those in underserved communities, restore their urban waters in ways that also benefit community and economic revitalization	➢ Activities that engage communities in learning about, planning and developing green infrastructure/LID approaches, programs and practices that enhance the sustainability of their communities and more effectively manage urban runoff/stormwater pollution	$40,000-$60,000 (2016)	Ruth Chemerys urbanwaters@epa.gov	USEPA
United States Environmental Protection Agency (USEPA)	Pollution Prevention (P2) Grant	Future funding unknown at this time	To support projects that use pollution prevention techniques to reduce and/or eliminate pollution from air, water and/or land prior to performing recycling, reuse, or clean up	➢ Offering pollution prevention workshops ➢ Offering technical advice to state agency staff who in turn use this information to train businesses on best management practices	Approximately $40,000-$500,000 50% match	Jessica Counts-Arnold 75 Hawthorne Street San Francisco, CA 94105 (415) 972-3288 counts-arnold.jessica@epa.gov PPP: (202) 566-0799 ppic@epa.gov	EPA P2 EPA P2 EPA P2
United States Environmental Protection Agency (USEPA)	Section 319 Nonpoint Source Grant Program	Schedule for solicitation unknown at this time	Reduction of nonpoint source pollution with emphasis on green infrastructure	➢ Streambed and habitat restoration ➢ Implementation of upstream LID practices to manage impervious surface runoff	$250,000 - $800,000 Minimum 25% match	Jeanie Mascia State Water Resources Control Board Nonpoint Source Pollution Unit (916) 323-2871 jeanie.mascia@waterboards.ca.gov	NPSGP NPSGP
United States Housing and Urban Development (HUD)	Community Development Block Grant (CDBG)	2017 Funding Cycle specific for Indian Tribes and Alaska Native Villages Schedule for future solicitations are unknown at this time	Creation of decent housing, suitable living environments, and economic opportunities primarily for persons with low and moderate incomes	➢ Eligible to fund stormwater and green infrastructure as projects create jobs, increase economic activity, and increase property value	Not Stated	Ray Brewer Field Office Director (Santa Ana) (714) 796-5577 CA_Webmanager@hud.gov	CDBG
Wildlife Conservation Board	California Stream Flow Enhancement Program (Prop 1)	Schedule for future solicitations unknown	Implement three broad objectives of the California Water Action Plan: more reliable water supplies; the restoration of important species and habitats; and a more resilient, sustainably managed water infrastructure that can better withstand inevitable and unforeseen pressures in the coming decades	➢ Groundwater storage and conjunctive use ➢ Changes in water management ➢ Habitat restoration and wildlife benefit ➢ Water Infrastructure improvements ➢ Reconnecting flood flows with restored flood plains ➢ Reservoir operations both at existing and new storage sites ➢ Reliability, restoration, and resilience	No minimum or maximum	Elizabeth Hubert elizabeth.hubert@wildlife.ca.gov (916) 445-1093 wcbstreamflow@wildlife.ca.gov	CSFEP
Loans							
California State Water Resources Control Board (SWRCB)	Clean Water State Revolving Fund	Applications are accepted on a rolling basis	To provide financial assistance through loans (with below market rates) for a wide range of water infrastructure projects, under 33 U.S. Code §1383	➢ Assistance for measures to manage, reduce, treat, or capture stormwater or subsurface drainage water ➢ Projects that reduce the demand for publicly owned treatment works capacity through water conservation, efficiency, or reuse ➢ Implement state nonpoint source pollution management program, established under CWA section 319	No limits, historically $1,000,000-$350,000,000	Bob Pontureri robert.pontureri@waterboards.ca.gov (916) 341-5828 (916) 327-9978 CleanWaterSRF@waterboards.ca.gov	CWSRF

Summary of Potential Funding Sources for SWRP Projects

Funding Agency	Program	Timeline	Purpose	Eligible Uses	Funding Limits	Contact Information	Link
California State Water Resources Control Board (SWRCB)	Loan Forgiveness - Clean Water State Revolving Fund	Applications are accepted on a rolling basis	To provide financial assistance through loans (with below market rates) for a wide range of water infrastructure projects, under 33 U.S. Code §1383	➢ Green Project Reserve (GPR) projects (Green Infrastructure, Water Efficiency, Energy Efficiency, and Environmentally Innovative Activities) ➢ Must address water or energy efficiency, mitigate stormwater runoff, or encourage sustainable project planning, design, and construction ➢ Must be a CWSRF eligible project; whether standalone or part of a larger project	50% of actual GPR costs; 75% planning costs; $4,000,000 Maximum loan forgiveness per project (Water recycling projects eligible for $2,500,000 max loan forgiveness)	(916) 327-9978 CleanWaterSRF@waterboards.ca.gov	SWRCB
California Infrastructure and Economic Development Bank	Infrastructure State Revolving Fund (ISRF)	Applications are accepted on a rolling basis	To serve a variety of public purposes including providing an accessible low-cost financing option to eligible borrowers for a wide range of infrastructure projects	➢ Project can consist of design, acquisition, planning, permitting, entitling, construction, improving, extending, restoring, financing, and generally developing facilities that include real personal property, structures, conveyances, equipment, thoroughfares, buildings, and supporting components thereof ➢ Infrastructure projects related to city streets, drainage/water supply/flood control, environmental mitigation measures, parks and recreational facilities, public transportation, water treatment and distribution, and more	$50,000-$25,000,000 with loan terms for the useful life of the project up to a max of 30 years; No match required	Tom Dear, Loan Origination Manager 1325 J Street, 18th Floor Sacramento, CA 95812 (916) 341-6600 LoanProgram@ibank.ca.gov	ISRF ISRF
The Conservation Fund	Conservation Loans	Applications are accepted on a rolling basis	To protect land, water, and wildlife, generate jobs, and balance human demand with the need to use natural resources responsibly	➢ Trail and park acquisitions and construction ➢ Habitat restoration and ecosystem services ➢ Initiatives to connect people to nature	Up to $500,000	Reggie Hall Conservation Loans (703) 908-5825 rhall@conservationfund.org (703) 525-6300 loans@conservationfund.org	CL

Attachment J

Multi-Benefit Project Request Form

San Bernardino County Santa Ana River Watershed Stormwater Resource Plan

The Flood Control District is seeking partners

Multi-Benefit Project Request Form

We want to know about your projects for inclusion in the Stormwater Resource Plan. If your project involves a partnership with the District and provides at least two benefits, then complete the form below. We will perform a metrics-based analysis of project benefits. Potential project benefits are listed below.

Water Quality
- Pollutant load reduction
- Stormwater runoff reduction

Flood Management
- Runoff rates and runoff volume reductions
- Flood elevation reduction
- Parcel/structure removal from floodplain
- Property value saved

Water Supply
- Groundwater recharge
  - Stormwater
  - Recycled water

Community
- Employment opportunities
- Public education
- Community involvement
- Enhancement/creation of
  - public spaces
  - walking paths
  - bike trails
  - sidewalks

Environmental
- Wetlands enhancement/ creation
- Riparian area enhancement
- Streambed restoration
- Increased urban green space

Tell us about your project

Project Name: _____

Submitting Agency: _____ Lead Agency: _____

Project Partners: _____

Contact: _____ Email: _____ Phone: _____

List main project components _____

_____

_____

How far along is the project?

- ☐ Just an idea
- ☐ Concept developed
- ☐ Preliminary design report
- ☐ Soils investigation
- ☐ Hydrology study
- ☐ Topographic survey
- ☐ Hydraulic study
- ☐ Flood study
- ☐ Design plans in progress
- ☐ Design plans completed

Attachment K

Printed Educational and Outreach Material

SAN BERNARDINO COUNTY
PUBLIC WORKS

You are invited!

The San Bernardino County Flood Control District is leading the development of a **Stormwater Resource Plan** for the San Bernardino County portion of the Santa Ana River Watershed and needs your **valuable insight**.

Be a part of this exciting process!

For more information please email swrp@cwecorp.com

Join the District in one of two outreach events!

Learn about:

- Proposition 1 Grant Funding
- The Stormwater Resource Plan (SWRP)
- How your agency can get involved

The District is seeking partners on future multi-benefit projects. Come share your ideas.

Stakeholder Outreach Events

Event #1

August 30, 2017 from 1:30 - 3:00 pm
Inland Empire Utilities Agency Board Room
6075 Kimball Avenue, Chino

Event #2

August 31, 2017 from 1:30 - 3:00 pm
Department of Public Works Hearing Room
825 E. Third Street, San Bernardino

We look forward to ongoing collaboration!

SAN BERNARDINO COUNTY
PUBLIC WORKS

You are invited!

The San Bernardino County Flood Control District is leading the development of a **Stormwater Resource Plan** for the San Bernardino County portion of the Santa Ana River Watershed. We need your help planning for the future of our **valuable water resources**.

Be a part of this exciting process!

Join the District at this public outreach event!

Learn about:

- Our water resources
- The Stormwater Resource Plan (SWRP)
- Multi-benefit projects
- How you can get involved

Provide feedback on the Draft SWRP

Come share your ideas.

For more information and to provide comments please email swrp@cwecorp.com

Public Outreach Event

July 24, 2018 from 5:00 - 7:00 pm
Department of Public Works Hearing Room
825 E. Third Street, San Bernardino

Refreshments will be provided

Review the draft SWRP at http://bit.do/SWRP and provide comments by August 7, 2018.

We look forward to seeing you there!

SAN BERNARDINO COUNTY
PUBLIC WORKS

¡Esta invitado!

El Distrito de Control de Inundaciones del Condado de San Bernandino esta liderando el desarrollo de un **Plan de Recursos de Aguas Pluviales (SWRP)** para la porción del Condado de San Bernandino localizado en la Cuenca del Rió Santa Ana. Necesitamos su ayuda para planear el futuro de nuestros **valiosos recursos hídricos**.

¡Sea parte de este proceso facinante!

¡Acompañe el Distrito en nuestro evento para el publico!

Aprende sobre:

- Nuestros recursos hídricos
- El Plan de Recursos de Aguas Pluviales (SWRP)
- Proyectos de beneficios múltiples
- Como puede participar

Ofrece su opinión sobre el borrador del SWRP

Vengan a compartir sus ideas.

Para más información y para ofrecer su comentario, envié un correo electrónico a swrp@cwecorp.com

Junta de información para el publico

24 de julio de 2018, 5:00 - 7:00 pm
Department of Public Works Hearing Room
825 E. Third Street, San Bernardino

Refrescos serán proporcionados

Revise el borrador del SWRP que se encuentra en http://bit.do/SWRP y proporcione su comentario por el 7 de agosto de 2018.

¡Esperamos verlos en la junta!

Frequently Asked Questions

1. What is a SWRP?

A Stormwater Resource Plan (SWRP) is a watershed based planning document that includes an evaluation of existing water resources and an identification of projects, programs, and activities that will enhance the beneficial uses of stormwater and dry-weather runoff. A metrics-based approach is used to quantify project/program benefits and prioritize future implementation. Projects/programs that provide multiple benefits, such as water quality, water supply, flood management, environmental, and community benefits, are identified in SWRPs. SWRPs are developed in coordination with multiple stakeholders and the public. The development of a SWRP provides opportunities for agencies and organizations to collaborate to find ways to capture, clean, infiltrate, and/or use runoff that otherwise would leave the watershed. SWRPs are adaptively managed overtime to address ongoing changes in regulatory policies and needs.

2. Who needs a SWRP and what are the benefits?

Any public agency, nonprofit organization, public utility, federally recognized Indian tribes, State Indian tribes, and mutual water companies may develop a SWRP. Developing a SWRP provides opportunities to receive funding through the Proposition 1 Stormwater Grant Program, administered through the State Water Resources Control Board (State Board). With limited exceptions for certain small disadvantaged communities, Water Code Section 10563(c)(1) requires stormwater and dry-weather runoff capture projects be included in a SWRP to receive stormwater grants from bond measures passed by the State of California after January 1, 2014. One such bond measure is Proposition 1, passed by voters in November 2014, which authorized $200 million in funding for multi-benefit stormwater management projects. Additionally, the development of a SWRP encourages agencies/organizations to evaluate the health of the watershed and plan projects and programs that will provide multiple benefits and address existing concerns.

3. What are the goals of a SWRP?

The development of SWRPs is a collaborative process that involves both stakeholders and the public. Goals pertaining to specific SWRPs are established through those collaborative efforts. In general, SWRPs have the following goals:

- Improve water quality by reducing runoff volumes and pollutants entering receiving waters to support beneficial uses
- Capture and use stormwater as a water supply resource
- Protect life and property through better management of flooding risks
- Use stormwater projects to enhance environmental and community benefits
- Identify multi-benefit projects that accomplish more than one of the goals identified above

4. What are the goals of the SBC SARW SWRP?

The San Bernardino County Santa Ana River Watershed (SBC SARW) SWRP will meet the general goals identified above in addition to some region specific goals. The main goal of the SBC SARW SWRP is to quantify the various benefits that result from implementation of projects and programs included in the plan. This allows the San Bernardino County Flood Control District (District) and partnering agencies to easily apply for funding opportunities available not only through the State Board and the Stormwater Grant Program, but also other water related funding opportunities. The quantification of benefits is required within the SWRP; however, the SBC SARW SWRP goes above and beyond those expectations to make applying for and obtaining funds easier.

5. What information is included in a SWRP?

Each SWRP will be different, but all will be prepared considering guidance set forth in the SWRP Guidelines developed by the State Board. At a minimum, the following information will be included in SWRPs, consistent with the guidelines:

- Description of watershed and sub-watersheds covered in the plan, including water quality priorities, identification of surface water and groundwater resources, account of local water supplies and suppliers, and a summary of existing natural habitat and open space within the watershed
- Identification of existing regional water management groups, public agencies, governments, non-profit organizations, utilities, and other stakeholders and the development of a process by which organizers of the SWRP consult, cooperate, and collaborate with each other
- Quantitative methods for identification and prioritization of stormwater and dry-weather runoff capture projects, including an integrated metrics based analysis of multi-benefit projects
- Identification and prioritization of stormwater projects based on how each project would improve water supply, water quality, flood management, environmental, and community benefits
- Identification of resources for plan implementation and project scheduling, including strategies for maintaining and amending the SWRP for future projects through an adaptive management process
- Provisions for community participation in plan development and implementation

6. How can we get a project included in the SBC SARW SWRP?

If your agency would like partner with the District on a multi-benefit project located within the SBC SARW area, and that project aligns with the goals of the SWRP, we would like to hear from you. Please send an email to SWRP@cwecorp.com and include the information requested in the project request flyer, such as contact person, partnering agencies, project name/components, and the status of the project. The more well-planned and well-quantified your project is, the likelier it will be to get matching funds from the State. The multiple benefits provided by projects included in the SBC SARW SWRP will be quantified and the results of this analysis will not only support future Proposition 1 grant applications, but other related funding opportunities that may exist in the future.

7. What is the difference between a SWRP and IRWMP?

An Integrated Regional Water Management Plan (IRWMP), such as the One Water One Watershed (OWOW) Plan prepared by the Santa Ana Water Project Authority (SAWPA), is different than a SWRP and an IRWMP does not automatically become a SWRP Equivalent document. According to the California Department of Water Resources, an IRMWP is a comprehensive planning document to encourage development of voluntary regional strategies for management of water resources. Projects identified in an IRWMP must address at least one water-related concern, but are not required to provide multiple benefits, as is required in a SWRP. Additionally, IRWMPs were developed in response to Proposition 50 and SWRPs are being developed in response to Proposition 1. IRWMPs are prepared by larger watershed areas, while individual SWRPs covering a much smaller area may be prepared.

Preguntas Más Frecuentas

1. ¿Qué es un SWRP?

Un Plan de Recursos de Aguas Pluviales (SWRP; por sus siglas en inglés) es un documento de planificación basado en cuencas que incluye una evaluación de los recursos hídricos existentes y una identificación de proyectos, programas y actividades que mejorarán los usos beneficiosos de las aguas pluviales y la escorrentía en clima seco. Se utiliza un enfoque basado en criterios para cuantificar los beneficios del proyecto/programa y priorizar la implementación futura. Los proyectos/programas que brindan múltiples beneficios, como la calidad del agua, el suministro de agua, el manejo de inundaciones, el medio ambiente y los beneficios para la comunidad, se identifican en un SWRP. Cada SWRP se desarrolla en coordinación con múltiples partes interesadas y el público. El desarrollo de un SWRP ofrece oportunidades para que las administraciones públicas y organizaciones colaboren para encontrar formas para capturar, limpiar, infiltrar y/o utilizar la escorrentía que de otro modo dejaría la cuenca. Cada SWRP se maneja de forma adaptativa a lo largo del tiempo para abordar los cambios en curso en las políticas y necesidades normativas.

2. ¿Quién necesita un SWRP y cuáles son los beneficios?

Cualquier administración pública, organización sin fines de lucro, utilidad pública, tribus indígenas reconocidas a nivel federal, tribus indígenas del estado y compañías de agua mutuales pueden desarrollar un SWRP. Desarrollar un SWRP brinda oportunidades para recibir fondos a través del Programa de Subvención de Aguas Pluviales de la Proposición 1, administrado a través de la Junta Estatal de Control de Recursos Hídricos (State Board). Con excepciones limitadas para ciertas comunidades pequeñas desfavorecidas, la Sección 10563 (c) (1) del Código de Agua exige que las aguas pluviales y los proyectos de captura de escorrentía se incluyan en un SWRP para recibir concesiones de aguas pluviales de medidas de bonos aprobadas por el Estado de California después del 1 de enero. 2014. Una de esas medidas de bonos es la Proposición 1, aprobada por los votantes en noviembre de 2014, que autorizó $ 200 millones en fondos para proyectos de administración de aguas pluviales de múltiples beneficios. Además, el desarrollo de un SWRP promueve a las agencias/organizaciones a evaluar el estado de la cuenca y planificar proyectos y programas que proporcionarán múltiples beneficios y abordarán las preocupaciones existentes.

3. ¿Cuáles son los objetivos de un SWRP?

El desarrollo de SWRP es un proceso de colaboración que involucra tanto a los interesados como al público. Las metas relacionadas con un SWRP específicos se establecen a través de esos esfuerzos de colaboración. En general, cada SWRP tiene los siguientes objetivos:

- Mejorar la calidad del agua al reducir los volúmenes de escorrentía y los contaminantes que ingresan a las aguas receptoras para apoyar usos beneficiosos
- Capturar y usar aguas pluviales como un recurso de suministro de agua
- Proteger la vida y la propiedad a través de un mejor manejo de los riesgos de inundación
- Utilizar proyectos de aguas pluviales para mejorar los beneficios ambientales y comunitarios
- Identificar proyectos de múltiples beneficios que logren más de uno de los objetivos identificados anteriormente

4. ¿Cuáles son los objetivos del SBC SARW SWRP?

El SWRP de la Cuenca del Río Santa Ana del Condado de San Bernardino (SBC SARW) cumplirá con los objetivos generales identificados anteriormente, además de algunos objetivos específicos de la región. El objetivo principal del SBC SARW SWRP es cuantificar los diversos beneficios que resulten debido a la implementación de proyectos y programas incluidos en el plan. Esto permite que el Distrito de Control de Inundaciones (Distrito) y las agencias asociadas del Condado de San Bernardino soliciten fácilmente las oportunidades de financiamientos disponibles no solo a través del State Board y el Programa de Subvenciones de Tormentas, sino también de otras oportunidades de financiamiento relacionadas con el agua. La cuantificación de los beneficios se requiere dentro del SWRP; sin embargo, el SBC SARW SWRP va más allá de esas expectativas para facilitar la solicitud y obtención de fondos.

5. ¿Qué información está incluida en un SWRP?

Cada SWRP será diferente, pero todos serán preparados teniendo en cuenta la pauta establecida en el documento SWRP Guidelines desarrolladas por el State Board. Como mínimo, la siguiente información se incluirá en los SWRP, en conformidad con las directrices:

- Descripción de cuencas y subcuencas cubiertas en el plan, incluidas las prioridades de calidad del agua, identificación de aguas superficiales y recursos de aguas subterráneas, cuenta de suministros de agua locales y proveedores, y un resumen del hábitat natural existente y el espacio abierto dentro de la cuenca
- Identificación de grupos regionales de administración del agua, agencias públicas, gobiernos, organizaciones sin fines de lucro, servicios públicos y otras partes interesadas y el desarrollo de un proceso mediante el cual los organizadores del SWRP consultan, cooperan y colaboran entre sí
- Métodos cuantitativos para la identificación y priorización de proyectos de captura de escorrentía en aguas pluviales y clima seco, incluyendo un análisis basado en métricas integradas de proyectos de múltiples beneficios
- Identificación y priorización de proyectos de aguas pluviales en función de cómo cada proyecto mejoraría el suministro de agua, la calidad del agua, el manejo de las inundaciones, el medio ambiente y los beneficios para la comunidad
- Identificación de recursos para la implementación del plan y la programación del proyecto, incluyendo estrategias para mantener y modificar el SWRP para proyectos futuros a través de un proceso de manejo adaptativa
- Disposiciones para la participación de la comunidad en el desarrollo e implementación del plan

6. ¿Cómo podemos incluir un proyecto en el SBC SARW SWRP?

Si su agencia quisiera asociarse con el Distrito en un proyecto de beneficios múltiples ubicado dentro del área de SBC SARW, y ese proyecto se alinea con los objetivos del SWRP, nos gustaría saber de usted. Envíe un correo electrónico a SWRP@cwecorp.com e incluya la información solicitada en el folleto de solicitud del proyecto, incluyendo nombre de la persona de contacto, agencias asociadas, nombre/componentes del proyecto y las condiciones del proyecto. Cuanto mejor planeado y mejor cuantificado sea su proyecto, más probable será obtener fondos del Estado. Los beneficios múltiples provistos por los proyectos incluidos en SBC SARW SWRP se cuantificarán y los resultados de este análisis no solo respaldarán las futuras solicitudes de subvenciones de la Proposición 1, sino también otras oportunidades de financiamiento relacionadas que puedan existir en el futuro.

7. ¿Cuál es la diferencia entre un SWRP y un IRWMP?

Un Plan Regional Integrado de Administración del Agua (IRWMP), como el Plan One Water One Watershed (OWOW) preparado por la Autoridad del Proyecto Acuático de Santa Ana (SAWPA), es diferente de un SWRP y un IRWMP no se convierte automáticamente en un documento equivalente a un SWRP (SWRP Equivalent). De acuerdo con el Departamento de Recursos Hídricos de California, un IRMWP es un documento de planificación integral para alentar el desarrollo de estrategias regionales voluntarias para el manejo de los recursos hídricos. Los proyectos identificados en un IRWMP deben abordar al menos un problema relacionado con el agua, pero no están obligados a proporcionar beneficios múltiples, como se requiere en un SWRP. Además, el desarrollo del IRWMP fue en respuesta a la Proposición 50, mientras el desarrollo del SWRP fue en respuesta a la Proposición 1. Otra diferencia es que los IRWMP se preparan en general por áreas de cuencas hidrográficas grandes, mientras un SWRP se puede preparar para una área mucho más pequeña.

San Bernardino County Santa Ana River Watershed Stormwater Resource Plan

The Flood Control District is seeking partners

Multi-Benefit Project Request Form

We want to know about your projects for inclusion in the Stormwater Resource Plan. If your project involves a partnership with the District and provides at least two benefits, then complete the form below. We will perform a metrics-based analysis of project benefits. Potential project benefits are listed below.

Water Quality
- Pollutant load reduction
- Stormwater runoff reduction

Flood Management
- Runoff rates and runoff volume reductions
- Flood elevation reduction
- Parcel/structure removal from floodplain
- Property value saved

Water Supply
- Groundwater recharge
  - Stormwater
  - Recycled water

Community
- Employment opportunities
- Public education
- Community involvement
- Enhancement/creation of
  - public spaces
  - walking paths
  - bike trails
  - sidewalks

Environmental
- Wetlands enhancement/ creation
- Riparian area enhancement
- Streambed restoration
- Increased urban green space

Tell us about your project

Project Name: _____

Submitting Agency: _____ Lead Agency: _____

Project Partners: _____

Contact: _____ Email: _____ Phone: _____

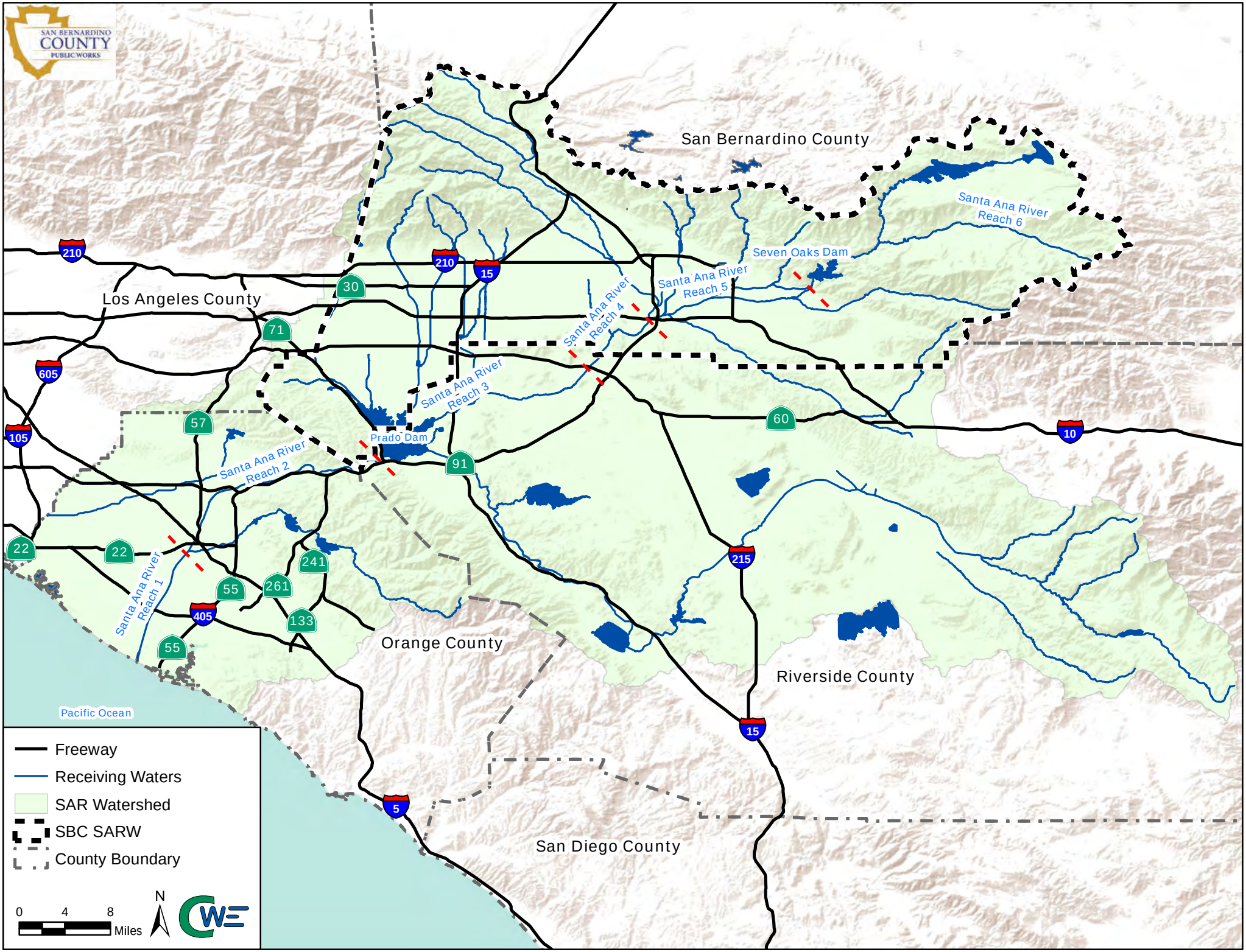
List main project components _____

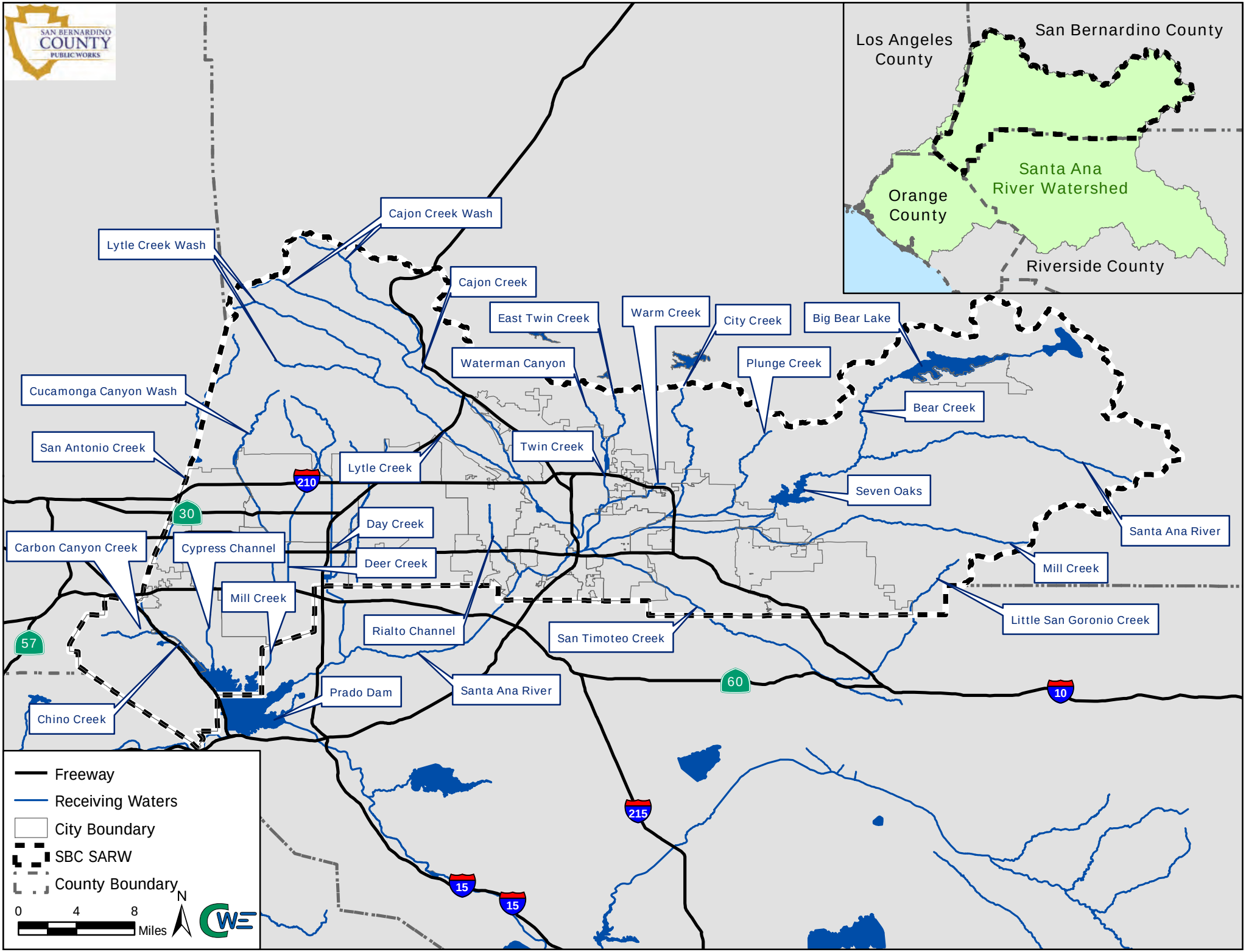
_____

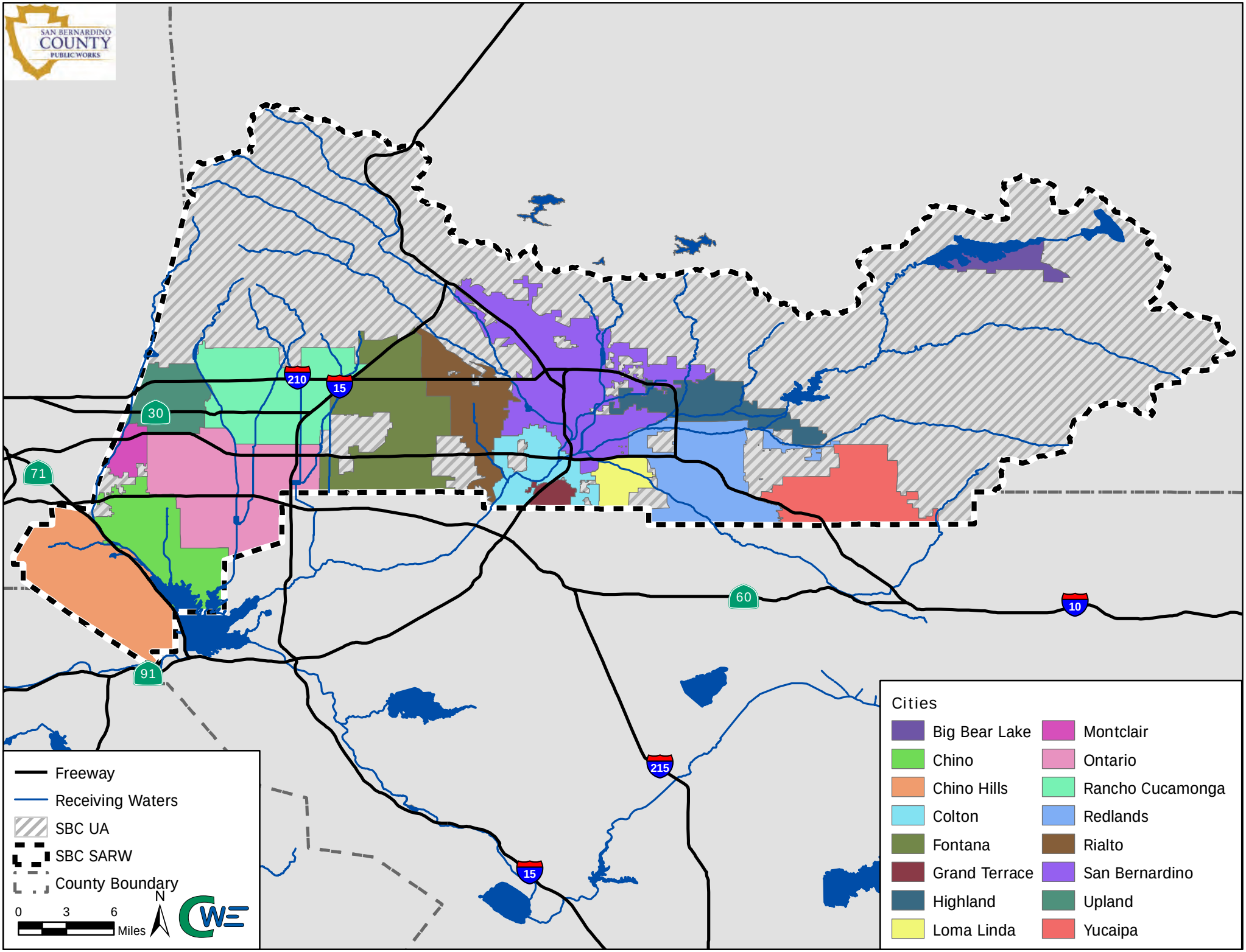
_____

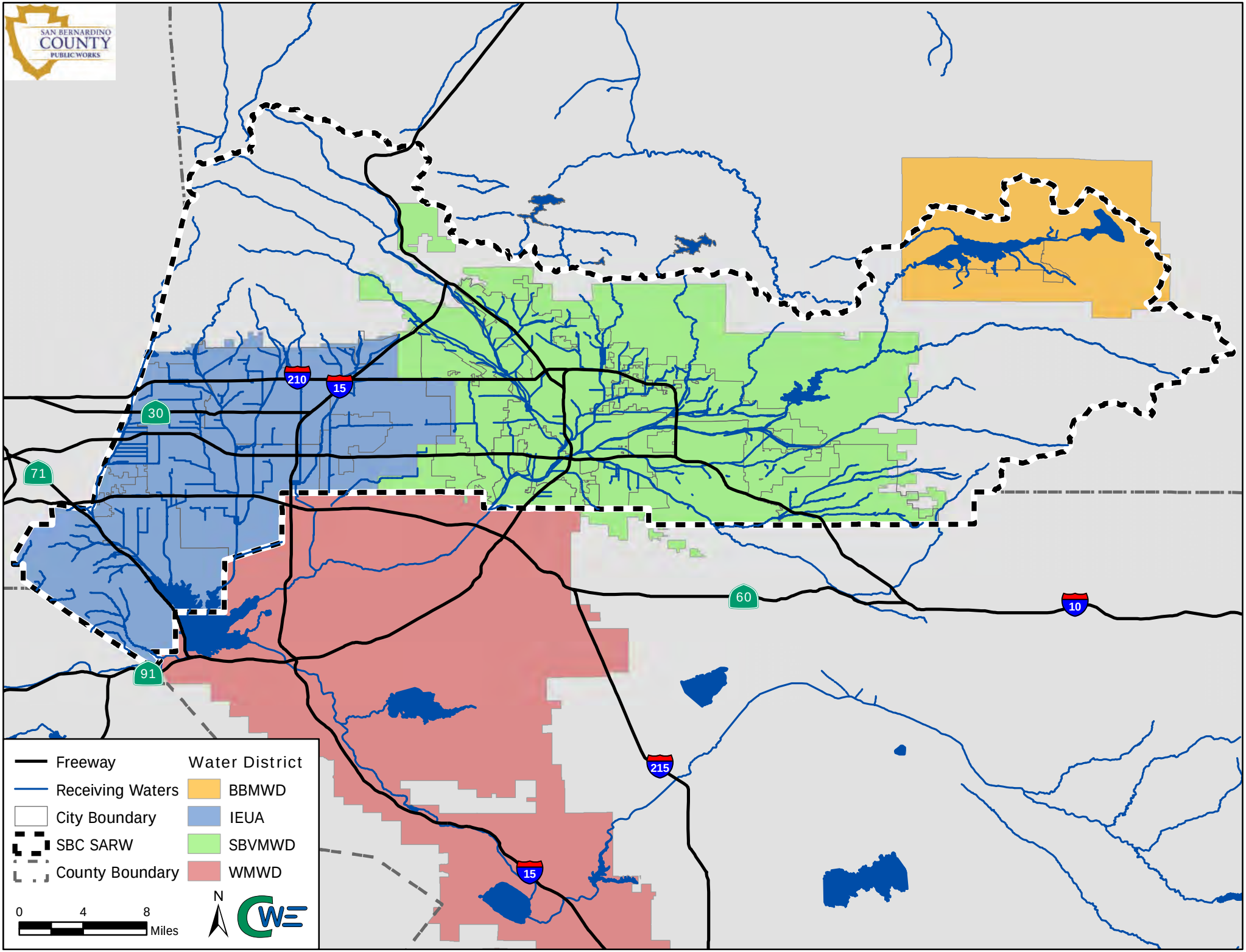
How far along is the project?

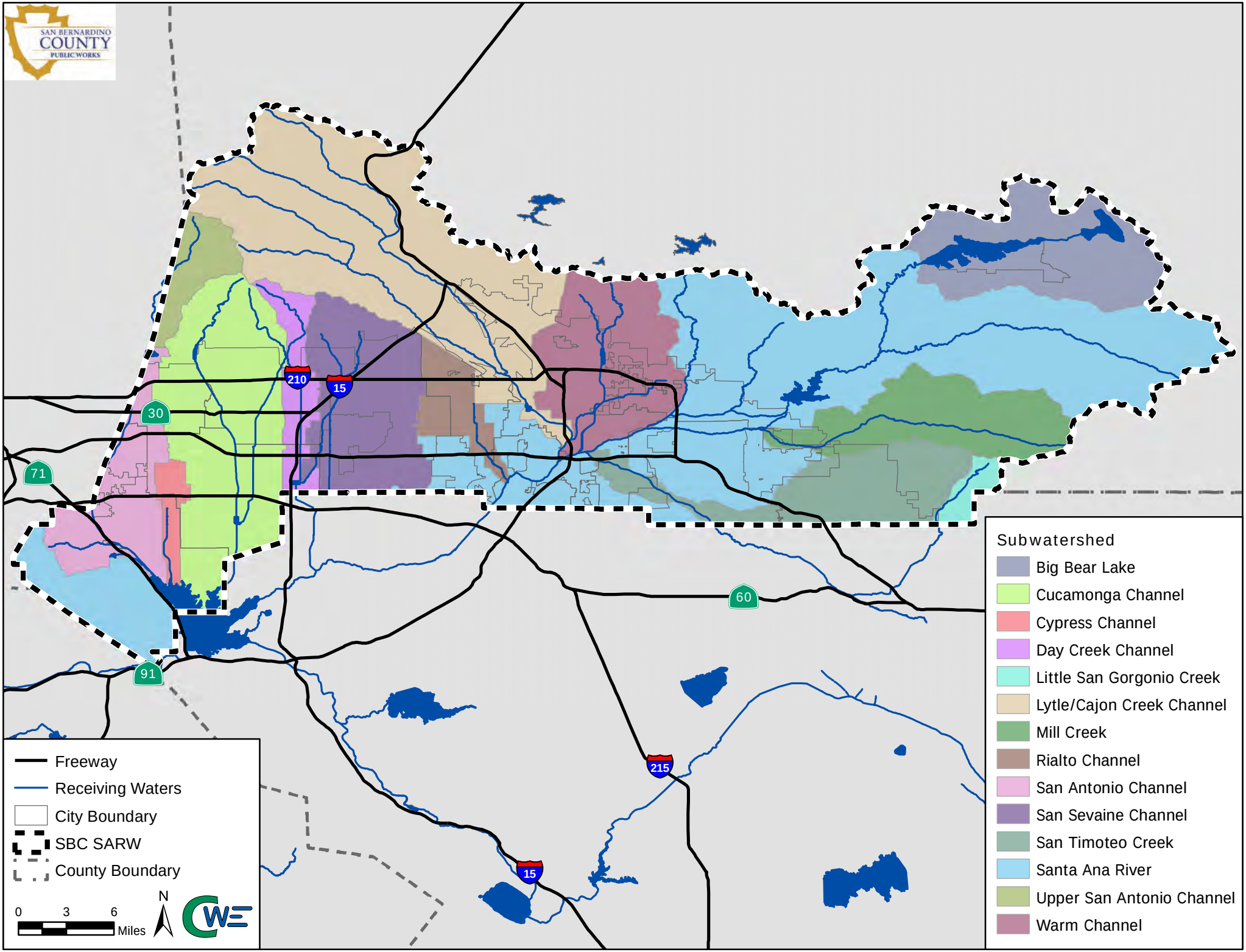
- ☐ Just an idea
- ☐ Concept developed
- ☐ Preliminary design report
- ☐ Soils investigation
- ☐ Hydrology study
- ☐ Topographic survey
- ☐ Hydraulic study
- ☐ Flood study
- ☐ Design plans in progress
- ☐ Design plans completed

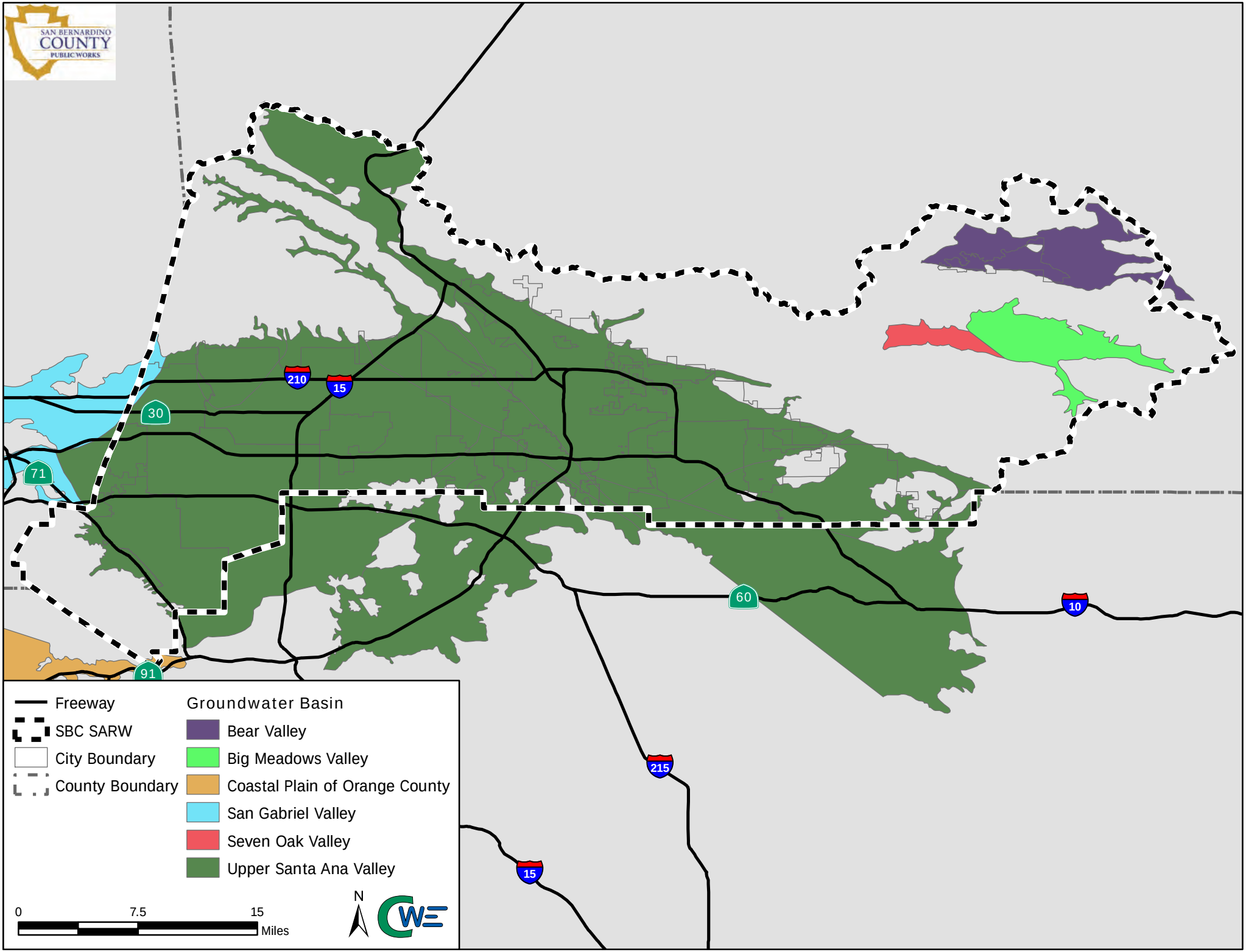

SAN BERNARDINO COUNTY PUBLIC WORKS
San Bernardino County
Los Angeles County
Orange County
Riverside County
San Diego County
Pacific Ocean
Santa Ana River Reach 1
Santa Ana River Reach 2
Santa Ana River Reach 3
Santa Ana River Reach 4
Santa Ana River Reach 5
Santa Ana River Reach 6
Prado Dam
Seven Oaks Dam
210
15
30
71
605
105
57
91
60
10
22
241
261
55
405
133
215
5
Freeway
Receiving Waters
SAR Watershed
SBC SARW
County Boundary
0 4 8
Miles
N

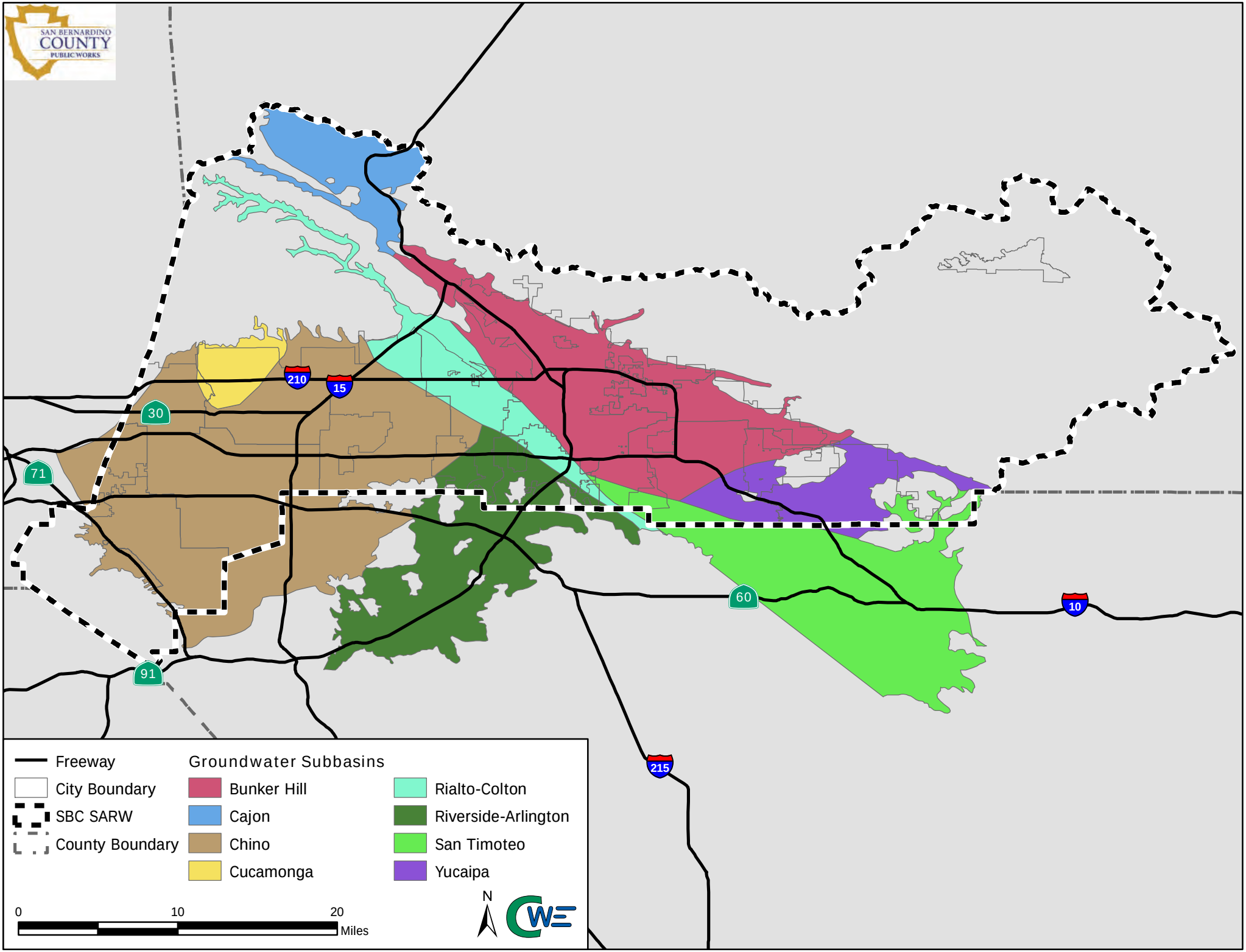

SAN BERNARDINO COUNTY PUBLIC WORKS
Los Angeles County
San Bernardino County
Santa Ana River Watershed
Orange County
Riverside County
Cajon Creek Wash
Lytle Creek Wash
Cajon Creek
East Twin Creek
Warm Creek
City Creek
Big Bear Lake
Waterman Canyon
Plunge Creek
Cucamonga Canyon Wash
Bear Creek
San Antonio Creek
Twin Creek
Lytle Creek
Seven Oaks
Day Creek
Santa Ana River
Carbon Canyon Creek
Cypress Channel
Deer Creek
Mill Creek
Mill Creek
Rialto Channel
San Timoteo Creek
Little San Goronio Creek
Prado Dam
Santa Ana River
Chino Creek
210
30
57
60
10
215
15
15
Freeway
Receiving Waters
City Boundary
SBC SARW
County Boundary
0
4
8
Miles
N

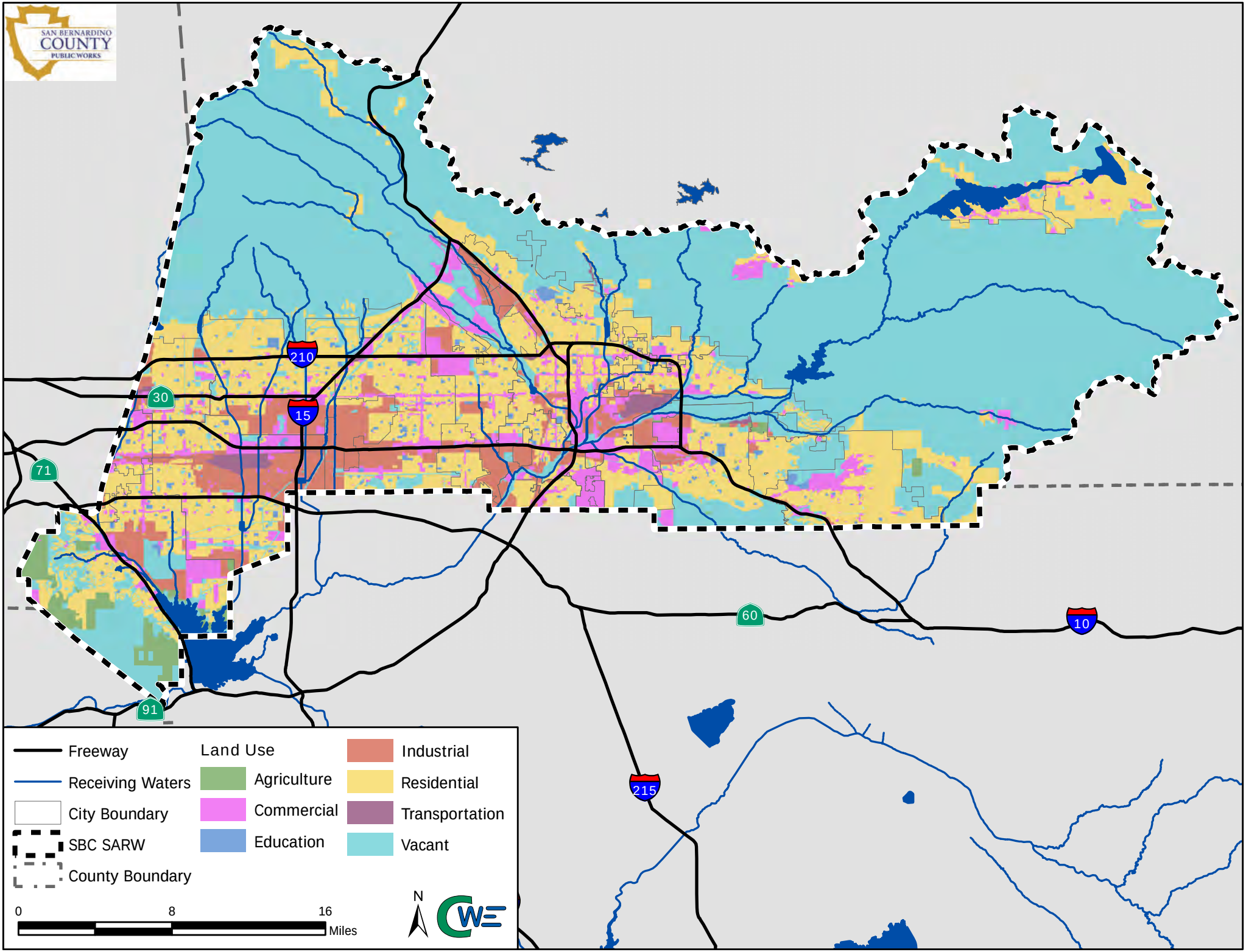

SAN BERNARDINO COUNTY
PUBLIC WORKS
210
15
30
71
91
60
10
215
15
Freeway
Receiving Waters
SBC UA
SBC SARW
County Boundary
0 3 6
Miles
N
Cities
Big Bear Lake
Chino
Chino Hills
Colton
Fontana
Grand Terrace
Highland
Loma Linda
Montclair
Ontario
Rancho Cucamonga
Redlands
Rialto
San Bernardino
Upland
Yucaipa


SAN BERNARDINO COUNTY
PUBLIC WORKS
210
15
30
71
91
60
10
215
15
Freeway
Receiving Waters
City Boundary
SBC SARW
County Boundary
Water District
BBMWD
IEUA
SBVMWD
WMWD
0
4
8
Miles
N


SAN BERNARDINO COUNTY PUBLIC WORKS
210
15
30
71
60
91
215
15
Subwatershed
Big Bear Lake
Cucamonga Channel
Cypress Channel
Day Creek Channel
Little San Gorgonio Creek
Lytle/Cajon Creek Channel
Mill Creek
Rialto Channel
San Antonio Channel
San Sevaine Channel
San Timoteo Creek
Santa Ana River
Upper San Antonio Channel
Warm Channel
Freeway
Receiving Waters
City Boundary
SBC SARW
County Boundary
0 3 6
Miles
N


SAN BERNARDINO COUNTY
PUBLIC WORKS
210
15
30
71
91
60
10
215
15
Freeway
SBC SARW
City Boundary
County Boundary
Groundwater Basin
Bear Valley
Big Meadows Valley
Coastal Plain of Orange County
San Gabriel Valley
Seven Oak Valley
Upper Santa Ana Valley
0
7.5
15
Miles
N


SAN BERNARDINO COUNTY
PUBLIC WORKS
210
15
30
71
91
60
10
215
Freeway
City Boundary
SBC SARW
County Boundary
Groundwater Subbasins
Bunker Hill
Cajon
Chino
Cucamonga
Rialto-Colton
Riverside-Arlington
San Timoteo
Yucaipa
0
10
20
Miles
N


SAN BERNARDINO COUNTY
PUBLIC WORKS
210
30
15
71
60
10
91
215
Freeway
Receiving Waters
City Boundary
SBC SARW
County Boundary
Land Use
Agriculture
Commercial
Education
Industrial
Residential
Transportation
Vacant
0
8
16
Miles
N

What is a SWRP?

A SWRP is a watershed based, public/stakeholder-driven, and adaptively managed plan that evaluates existing water resources and identifies projects, programs, and activities that will enhance the beneficial uses of stormwater and dry-weather runoff.

Adaptive Management

New Data
(water quality, studies, objectives, etc.)

Public and Stakeholder Input

SWRP Development
Apply Assessment Tools
Evaluate Multiple Benefits
Determine Implementation Approach

Benefit Categories

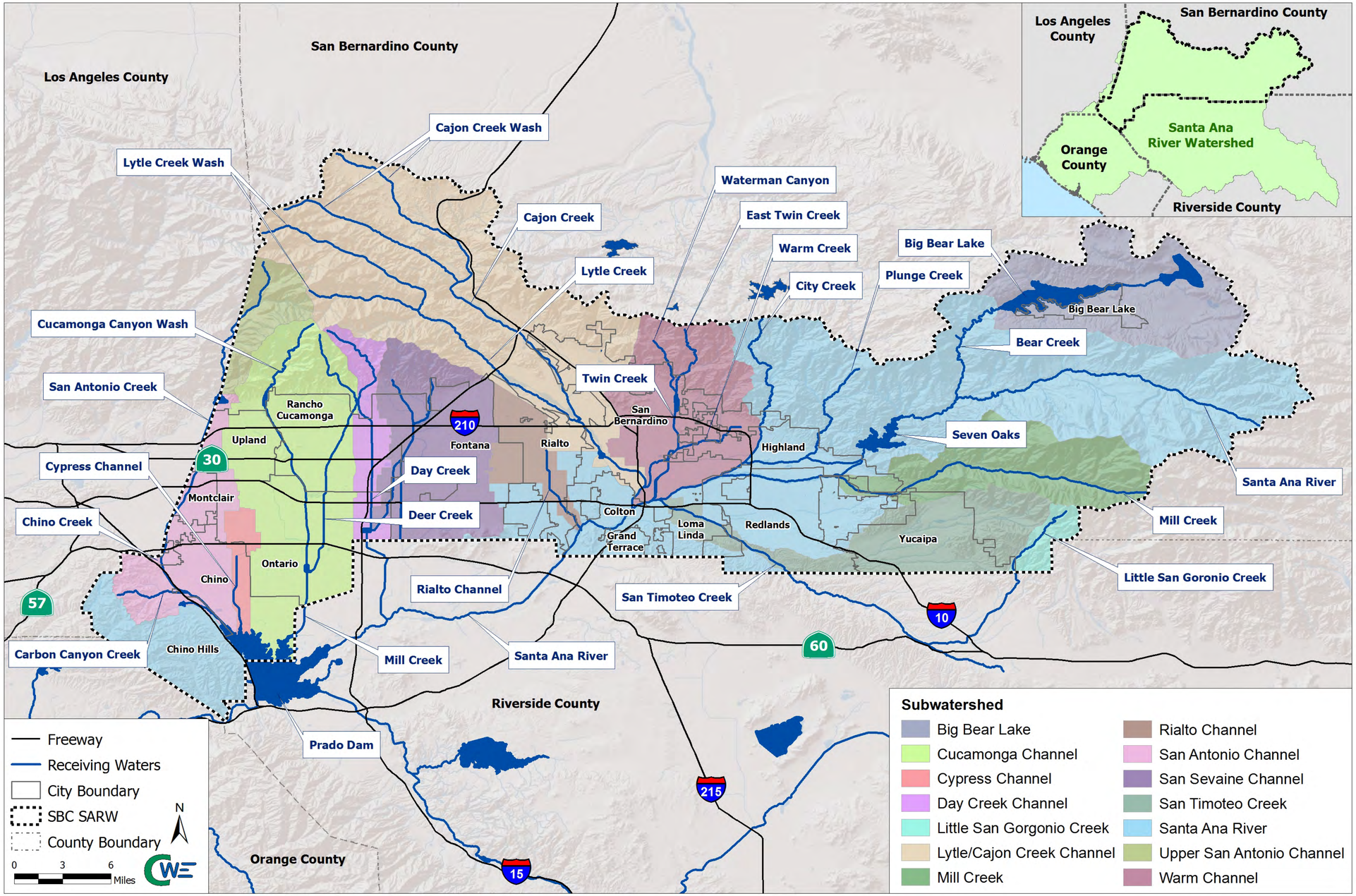
- Water Quality
- Flood Management
- Water Supply
- Community
- Environmental

San Bernardino County

Santa Ana River Watershed Stormwater Resource Plan

SAN BERNARDINO COUNTY PUBLIC WORKS

SWRP Area Map



San Bernardino County

Santa Ana River Watershed Stormwater Resource Plan

SAN BERNARDINO COUNTY PUBLIC WORKS

What types of projects are included?

Groundwater Recharge

Habitat Restoration

Channel Improvements

Water Quality Enhancements

Passive Recreation

Recycled Water

San Bernardino County

Santa Ana River Watershed Stormwater Resource Plan

SAN BERNARDINO COUNTY
PUBLIC WORKS

What are the multiple benefits?

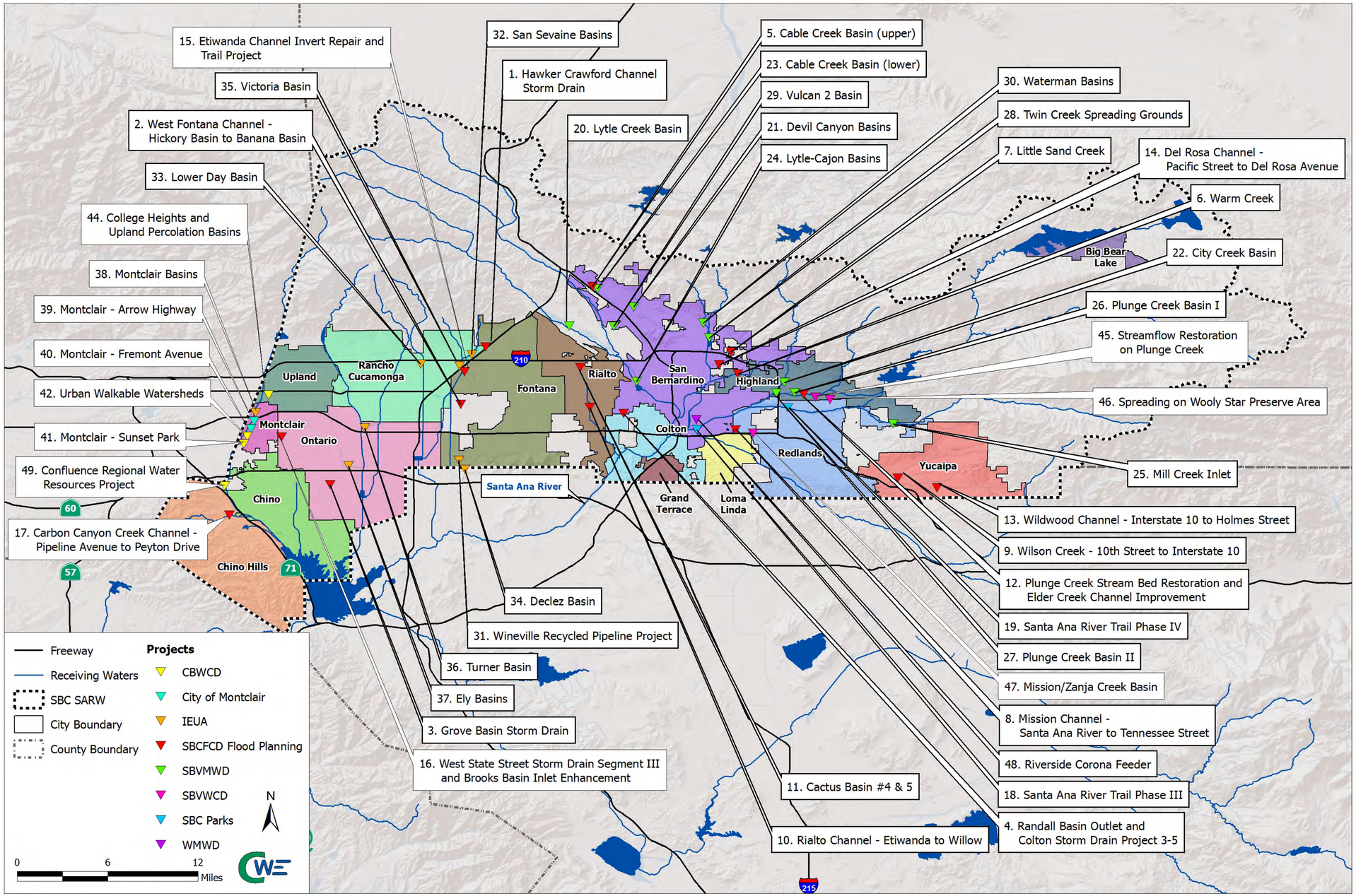
Projects, programs, and activities identified in the SWRP will provide the multiple benefits described below.

GOALS	OBJECTIVES
Enhance Water Quality	Pollutant Load Reduction Stormwater Runoff Reduction
Maximize Water Supply	Stormwater Recharge Recycled Water Recharge
Improve Flood Management	Runoff Rate & Volume Reduction Flood Elevation Reduction Floodplain Parcels/Structures Removal Saved Property Value
Protect the Environment	Wetlands Enhancement/Creation Riparian Area Enhancement Streambed Restoration Increased Urban Green Space
Provide Community Benefits	Employment Opportunities Public Education and Community Involvement Recreational Paths Enhancement/Creation Public Use Area Enhancement/Creation

OUTCOMES

- Removal of roughly **four quadrillion** (4×10^{15}) MPN **E. coli bacteria** per year.
- Reduce the discharge of untreated stormwater by approx. 41,500 **acre-feet** per year.
- Cumulatively capture on average around 41,500 **acre-feet** of stormwater per year and use the volume to recharge local aquifers.
- Capture about 5,600 **acre-feet** of recycled water per year for groundwater recharge.
- Provide a benefit of reducing the peak flow rate during floods, with a maximum predicted flow rate reduction of 600 **cfs**.
- Cumulatively prevent 41,500 **acre-feet** of stormwater from reaching flood-prone areas.
- Reduce the water surface elevation during a flood event, with a maximum predicted flood elevation reduction of almost 9 **feet**.
- Remove over 1,700 **parcels** from the risk of flooding during a 100-year storm event. These parcels have a combined value of over **$510 million**.
- Enhance or create 2 **acres** of wetlands.
- Restore or enhance almost 31 **acres** of riparian habitat.
- Restore at least 2,300 **feet** of streambed to natural conditions, creating and preserving critical habitat for endangered species.
- Increase the amount of urban green space by about 66 **acres**.
- Construction is estimated to provide roughly 4,400 **job-years** of employment opportunities to the community. Estimated at cumulatively providing over 1,100 **new jobs**.
- Public education in at least **five projects**, including interpretive signage to increase the public's understanding of water quality protection and using stormwater as a resource.
- Increased permanent community involvement in at least **three projects**.
- Create or enhance over 24 **miles** of multi-use paths and trails for public use.
- Over 64 **acres** of new public use and recreational space will be created by the construction of the projects.

SWRP Projects



San Bernardino County

Santa Ana River Watershed Stormwater Resource Plan

SAN BERNARDINO COUNTY PUBLIC WORKS

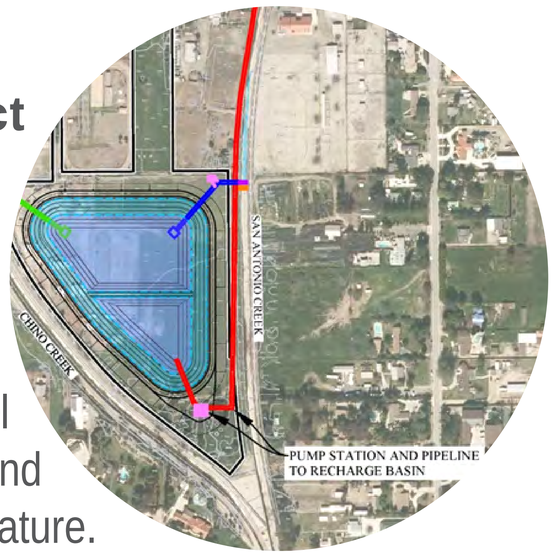
SWRP Example Projects

Cactus Basin No. 4 and 5

This project will provide beneficial uses in Disadvantaged Communities in Rialto and the Inland Empire by increasing the volume of stormwater captured to rechage groundwater, while enhancing water quality and protecting thousands of structures from flooding.

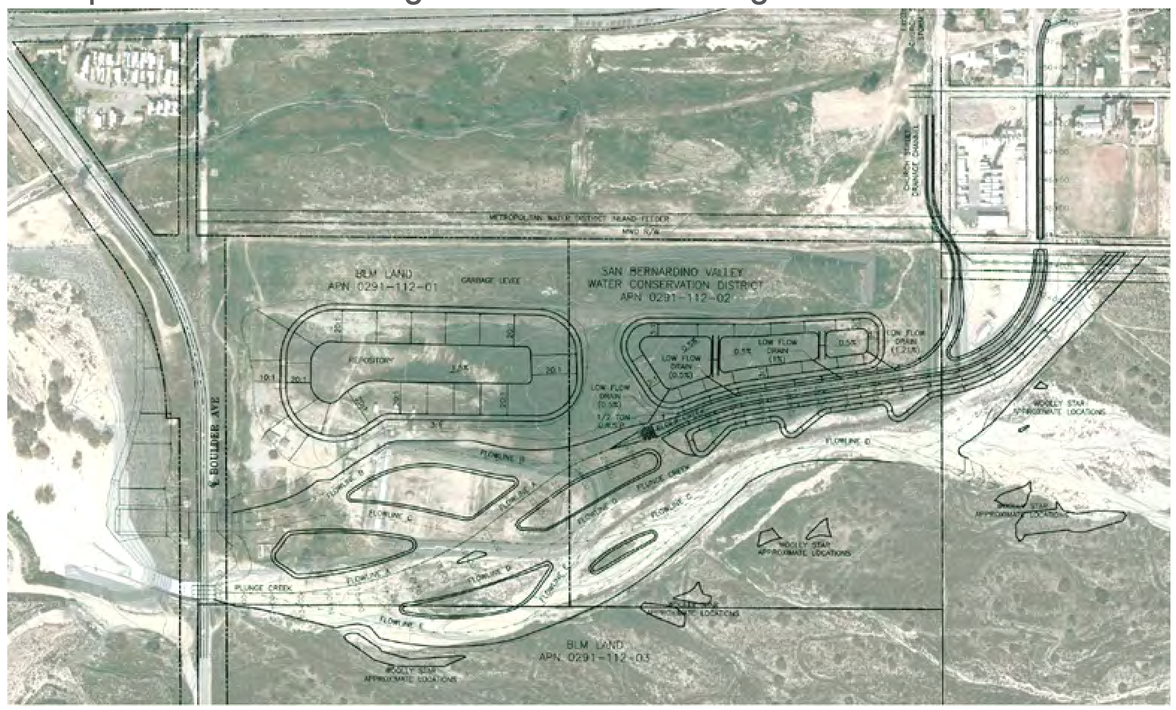
Confluence Basin Project

This project will construct a new groundwater recharge and storage reservoir where Chino and San Antonio Creeks meet. A habitat and bioremediation channel will be used as an educational and wetland habitat feature.



Elder Creek

The Elder Creek/Plunge Creek confluence project, a continuation of SBVWCD's Plunge Creek restoration project, will rehabilitate the ecological function of the Santa Ana River Wash area. The project will spread stormwater through braided channels to restore natural watershed processes, enhance groundwater recharge, and improve downstream water quality. The project will also improve Elder Gulch upstream of the confluence to reduce sedimentation and protect surrounding areas from flooding.



San Bernardino County

Santa Ana River Watershed Stormwater Resource Plan

SAN BERNARDINO COUNTY
PUBLIC WORKS

Next Steps

June 29, 2018	Public SWRP Draft posted online
August 7, 2018	Public Comments due
August 31, 2018	Comments addressed in Final Draft SWRP
October 31, 2018	Final SWRP
Late 2018	Present SWRP to SAWPA
Late 2018/Early 2019	Proposition 1 Funding Application Released
2019	Apply for Funding
2020 - Onward	Implement Projects

Email:
swrp@cwecorp.com
for additional information

E: Vulnerability to Catastrophic Interruption of Water Supply and Disaster Preparedness

Table of Contents

1 Background

This appendix addresses vulnerability of the region's water supply system to catastrophic events that may interrupt the water supply system in the Upper Santa Ana IRWM Plan Region (region). California Water Code Section 10632 (c) requires that Urban Water Management Plans address catastrophic supply interruptions. While not the only cause for catastrophic water supply interruption, the postulated Magnitude 8+ Earthquake certainly will be the predominant example in the region. Since a large magnitude earthquake is generally considered the most significant event for the region, we will concentrate on earthquake effects as our primary water supply interruption, knowing that other events would be treated similarly. Literature to be reviewed includes post-earthquake surveys of water system damage, earthquake planning reports, purveyor's Urban Water Management Plans and available reports prepared by the Department of Water Resources. We have concentrated the following discussions with a magnitude 8+ earthquake. Other catastrophic interruptions caused by regional power failure, terrorist attack, or other man-made or natural catastrophic event could cause similar conditions and issues to water supply systems in the region. For purposes of this report, a major earthquake is defined as an earthquake on the San Andreas Fault (SAF) on the order of 8.0.[1]

The work conducted for this appendix is intended to be the first step and is at the conceptual level. Additional detailed work should be conducted in the future to further evaluate options to effectively address water supply system vulnerabilities. This appendix includes the discussion of the following:

- An earthquake literature search of major earthquake events and what has been learned from such events.
- Evaluation of Catastrophic interruption of the regional facilities
- Vulnerabilities of region's water supply system to SWP supply interruption.
- Vulnerably of local purveyors' system to an earthquake .
- Summary of Finding and Recommendations including Water Shortage Contingency Plan

[1] The California Division of Mines and Geology has prepared two "Planning Scenarios" for major earthquakes in southern California. The first was a Magnitude 8.3 Earthquake on the San Andreas Fault (California, 1982). The second was a magnitude 7 earthquake on the San Bernardino Valley segment of the San Jacinto Fault (California, 1993).

- Options to reduce the impacts in case of catastrophic water supply system failure.
- Water Shortage contingency planning.

The region is located in a seismically active area of Southern California. Four major fault zones are found in the region, including the San Jacinto Fault, the Chino-Corona segment of the Elsinore Fault, the Cucamonga Fault, and the San Andreas Fault (SAF). Numerous other minor faults associated with these larger fault structures may also present substantial hazards.

The SAF is a right-lateral strike-slip fault that runs approximately 800 miles through western and southern California. The fault marks a transform boundary between the Pacific Tectonic Plate and the North American Tectonic Plate.

In Southern California, the SAF runs along the southern base of the San Bernardino Mountains, crosses through Cajon Pass, and continues northwest along the northern base of the San Gabriel Mountains. Historical records indicate that massive earthquakes have occurred in the central section of the SAF in 1857 and in the northern section in 1906 (the San Francisco Earthquake). In 1857, an estimated magnitude 8+ earthquake occurred on the San Andreas Fault rupturing the ground for 200 to 275 miles, from near Cholame to Cajon Pass and possibly as far south as San Gorgonio Pass. The recurrence interval for a magnitude 8 earthquake along the total length of the fault is estimated to be between 50 and 200 years. It has been 147 years since the 1857 rupture. A study completed by Yuri Fialko (2005) suggests that the SAF in Southern California has been stressed to a level sufficient for an earthquake of magnitude 7.0 or greater.

A detailed earthquake-related literature search was conducted to prepare this report. The literature search included review of the following events and reports:

- Loma Prieta Earthquake of October 17, 1989
- Northridge Earthquake of January 17, 1994
- Santa Clara Valley Water District Water Infrastructure Reliability Project
- San Simeon Earthquake of December 22, 2003
- Denali Earthquake of November 3, 2002
- City of San Diego Water Supply Study
- City of Vancouver Regional Water Distribution System Study
- San Fernando Earthquake of 1971
- Kobe (Japan) Earthquake of January 17, 1995
- California Division of Mines and Geology Planning Scenarios

Attachment A summarized this literature search.

2 Evaluation of a Catastrophic Interruption to Regional Facilities

The California Aqueduct has been designed to "break" at the Devil Canyon Powerplant in a large earthquake.

Some of Valley District's pipelines cross the San Andreas Fault. This section evaluates the impact of a catastrophic interruption on Valley District's regional facilities used to convey SWP water supplies and specific actions that may be taken to minimize the impact on water deliveries.

2.1 Facility Evaluation

The individual facilities that were examined in this analysis are as follows:

- Foothill Pipeline
- Santa Ana River Connector (SARC) Pipeline
- Greenspot Pump Station
- Morton Canyon Connector
- Greenspot Pipeline
- Tate Pump Station
- Crafton Hills Pump Station
- Crafton Hills Reservoir
- Crafton Hills Pipeline, portion of EBX
- Yucaipa Pipeline
- Bryant Street Pipeline
- Lytle Pipeline
- Baseline Feeder System

Given a loss of each of the above facilities, the examination will include:

- How the water supply needs of the affected service area could be met.
- To what degree local groundwater and/or surface water can replace the loss of the SWP
- What projects would be required to mitigate the loss of the facility.

- What projects could be implemented to mitigate the impact of catastrophic failures of these facilities.

Figure AF-1 shows the location of Valley District's major facilities relative to fault lines.

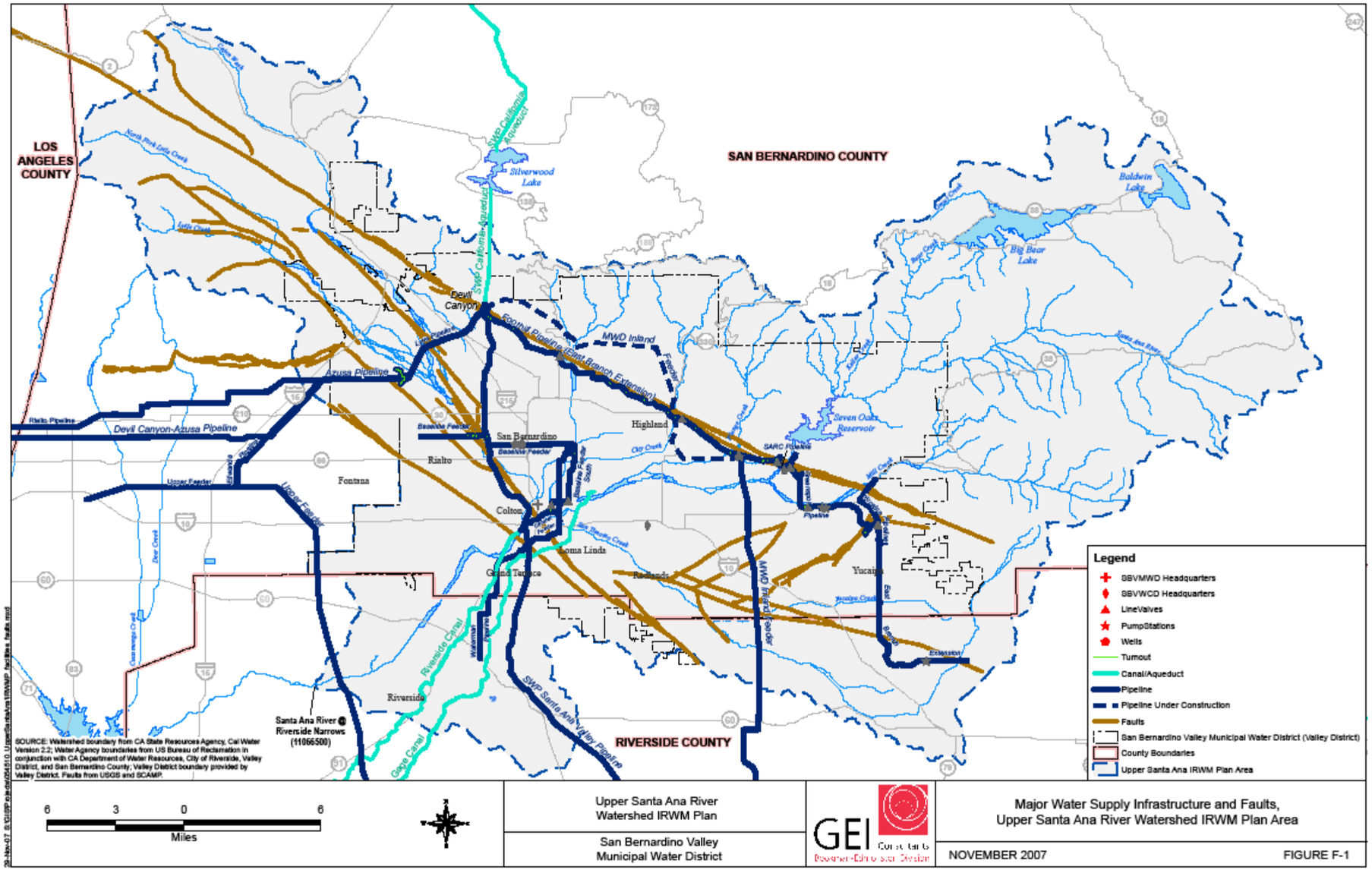
In general, Valley District direct deliveries are to surface water treatment plants that were built to treat local surface water and SWP water. Local surface water, collected and conveyed by the purveyor's own system is the least costly and highest quality. Valley District's SWP deliveries supplement these supplies.

Valley District also makes direct deliveries for irrigation. These deliveries are assumed to be able to be suspended during severe events and will not be investigated further.

Table AF-1 shows the Valley District conveyance facilities and the surface water treatment plants that receive deliveries of imported and surface water from those facilities. This table shows how interruption in each of the Valley District facilities may impact water deliveries for the local purveyors. Valley District's conveyance system is used to implement the Santa Ana-Mill Creek Cooperative Water Project and effect deliveries of local surface water and exchanges of local surface water and SWP water. Furthermore, these facilities could be used to convey local surface water from the Santa Ana River and/or Mill Creek in the east to delivery points in the west along the Lytle Creek Pipeline. In the past, Valley District has demonstrated this capability by delivering local surface water from the Santa Ana River to Devil Canyon where it was transferred to Metropolitan Water District of Southern California and conveyed to the Weymouth Water Filtration Plant.

It should also be mentioned that the California Division of Mine and Geology planning scenario for a major earthquake on the San Jacinto Fault concludes that the Santa Ana Valley (a SWP facility) Pipeline will also be damaged extensively as the fault and pipeline cross several times. Since Valley District does not have any current delivery points along this pipeline, it is not considered in this analysis.

Figure F-1
Water Supply Infrastructure and Faults



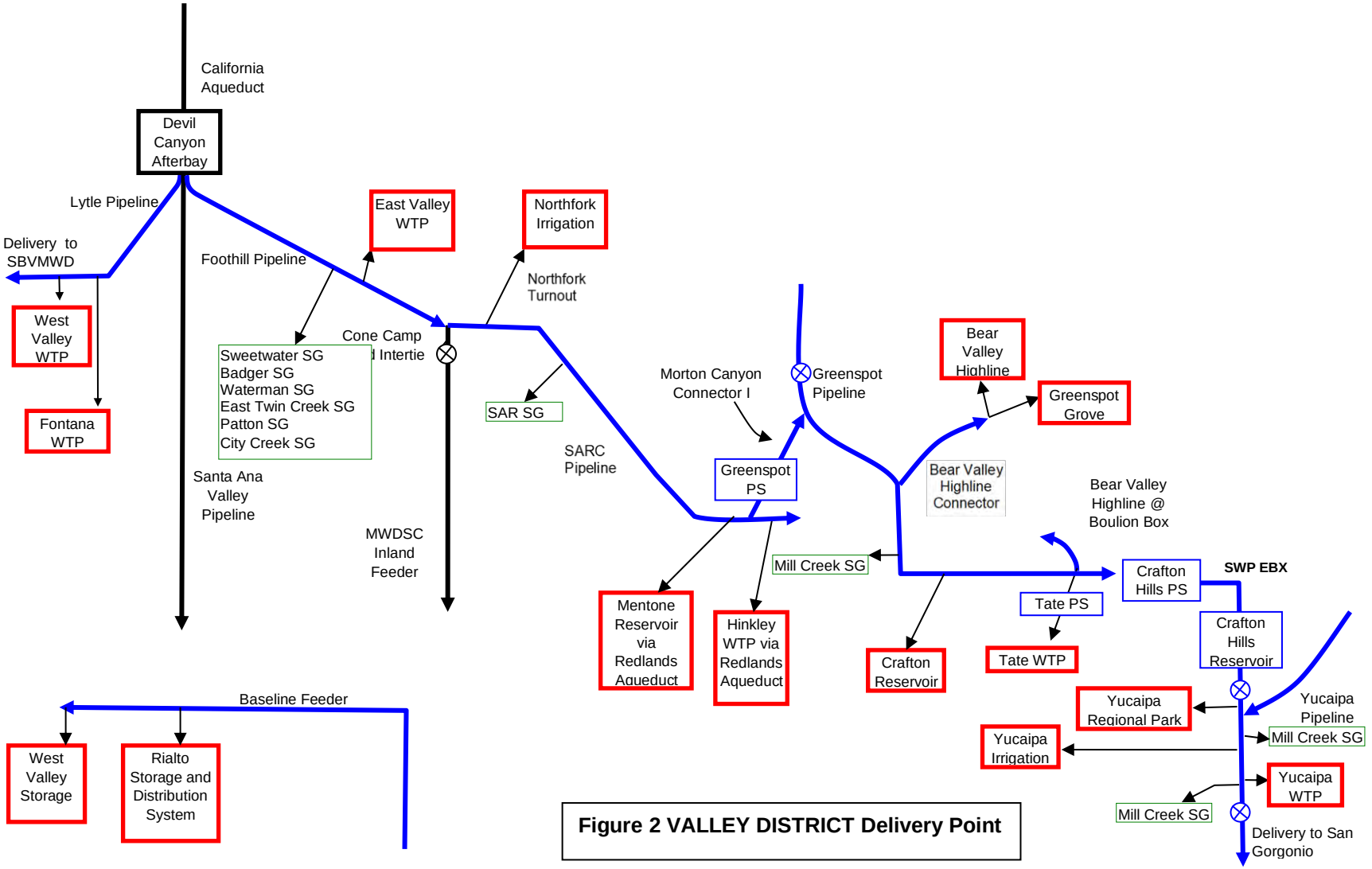


Figure 2 VALLEY DISTRICT Delivery Point

NOTE: Arrows indicate the primary flow direction. In some cases, water can also flow in the opposite direction, in an emergency, for short durations.

Table AF-1
Valley District Facilities Used to Deliver Water to Retail Agencies

Agency	Foothill Pipeline	SARC Pipeline	Morton Canyon Connector	Green-spot Pipeline	Green-spot Pump Station	Devil Canyon - Azusa	Tate Pump Station	Crafton Hills PS	Crafton Hills Reservoir	EBX[1] Reach 1 Pipeline	EBX Reach 2 Pipeline	Yucaipa Pipeline	Baseline Feeder
San Bernardino Municipal Water Department	✓	✓[2]	✓[2]	✓[2]	- -	- -	- -	- -	- -	- -	- -	- -	- -
East Valley Water District	✓	✓[2]	✓[2]	✓[2]	- -	- -	- -	- -	- -	- -	- -	- -	- -
City of Redlands – Hinckley	✓	✓	✓[3]	✓[3]	✓[3]	- -	- -	- -	- -	- -	- -	- -	- -
City of Redlands – Tate	✓	✓	✓	✓	✓	- -	✓	- -	- -	- -	- -	- -	- -
Bear Valley MWC - In lieu obligation and irrigation	✓	✓	✓	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Yucaipa Valley Water District	✓	✓	✓	✓	✓	- -	- -	✓	✓	✓	✓	✓	- -
Fontana Water Company	✓[2]	✓[2]	✓[2]	✓[2]	- -	✓	- -	- -	- -	- -	- -	- -	- -
West Valley Water District	✓[2]	✓[2]	✓[2]	✓[2]	- -	✓	- -	- -	- -	- -	- -	- -	✓
City of Rialto (SWP thru WVWD)	✓[2]	✓[2]	✓[2]	✓[2]	- -	✓	- -	- -	- -	- -	- -	- -	✓

Notes:

[1]EBX: East Branch Extension of the California Aqueduct

[2] Used only in an emergency condition to deliver Santa Ana River and/or Mill Creek water in a westerly direction.

[3] Could be used to receive a water delivery from Bear Valley Mutual Water Company

Valley District's conveyance system is used to implement the Santa Ana-Mill Creek Cooperative Water Project and effect deliveries of local surface water and exchanges of local surface water and State Project water.

The Devil Canyon - Azusa Pipeline is owned by San Gabriel Valley Municipal Water District. Valley District owns 50% of the conveyance capacity of the pipeline from Devil Canyon to the Lytle Creek area and uses this capacity to convey water to West Valley, Rialto, and Fontana. It could also be used in an emergency to convey local surface water.

The Baseline Feeder is used to convey groundwater to Rialto and West Valley. The groundwater is produced by the City of San Bernardino on behalf of Valley District and by Rialto for Rialto.

Valley District deliveries to San Bernardino Municipal Water Department are for recharge. Changes in recharge impact well hydrographs in six to seven months.

2.2 Findings and Recommendations

Table AF-1 summarizes the Valley District facilities which purveyors utilize. This table also includes Valley District facilities that could be used to make other deliveries in an emergency situation. Table AF-1 shows that all purveyors listed could be impacted by interruption in the Foothill Pipeline, SARC Pipeline and Morton Canyon Connector. Therefore, these four pipelines are the most vulnerable Valley District facilities in the case of a major earthquake along the San Andreas Fault. Specific recommendations to manage the catastrophic interruption are discussed below.

2.2.1 Alternative Local Supplies

2.2.1.1 Interties between Purveyors

Table AF-2 lists interconnections between purveyors. These interties could be used to balance supplies between purveyors. An interconnection between the City of San Bernardino and East Valley is currently being used to facilitate blending. This use is anticipated to end in the near future.

Table AF-2 – System Interties between Purveyors

Transfer	Direction	Capacity (MGD)	Remarks/data source
City of San Bernardino/East Valley	Either	4	Three interties. One currently used to facilitate blending.
City of San Bernardino/Riverside	To San Bernardino	2	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/West Valley	Either	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Loma Linda	Either	5	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Colton	To Colton	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Rialto	Either	3.6	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/ Riverside Highland	To Riverside/ Highland	3	(San Bernardino UWMP, Pg 2-10)
Fontana/Cucamonga Valley	Either	3.6	Fontana UWMP (2500 gpm)
West Valley/Fontana	Either		West Valley UWMP.
West Valley/Rialto	Either		West Valley UWMP.
West Valley/Colton			West Valley UWMP.
Redlands/Loma Linda	To Loma Linda		Greg Gage
Rialto[1]/Marygold	To Marygold		Rialto has historically conveyed 1,500 afy of groundwater to Marigold. The agreement under which this was accomplished is expiring.

Sources: San Bernardino Municipal Water Department 2005 UWMP; Jack Nelson, Yucaipa Valley; Ron Buchenwald, East Valley; Greg Gage, Valley District, West Valley 2005 UWMP.

[1] Rialto has several connections with other systems, including four connections with West Valley Water District, and connections with City of San Bernardino, Fontana Water Company, and Riverside Highland Water Company.

Based on the limited sources of data, this list may be incomplete.

2.2.1.2 Use of Big Bear Lake

Big Bear Lake has a capacity of over 70,000 acre-feet. The goal of Big Bear Lake Municipal Water District is stabilization of the level of Big Bear Lake by managing the amount of water released to the downstream water rights holder. That is, water is kept stored in the lake at all times for recreational use. Bear Valley Mutual Water Company (Mutual) has rights to a large portion of the lake. Through an agreement with Big Bear Municipal Water District (Big Bear), Valley District provides SWP water to Mutual instead of water being released from the lake. However, in an emergency situation, it may be possible for water to be released from the lake for a short duration. A legal framework could be established to make this water available in case of a catastrophe that prevented Valley District from making its deliveries under the agreement with Big Bear.

2.2.2 Increased Groundwater Production Capacity and Reliability

In general, the groundwater basin is presently able to meet peak demands using wells without Valley District facilities. If the catastrophe is an earthquake, the most likely impact on groundwater production capacity will be damage to the electrical system of the well or to the electricity supplier's system, and backup power supplies at key production wells will be necessary

Thus, depending on the system of each purveyor, increasing the purveyor's groundwater production capacity and the reliability of that capacity may improve the area's ability to operate after a catastrophic failure.

2.2.3 Alternative Conveyance of Surface Water

2.2.3.1 Alternatives to Foothill Pipeline System

As stated earlier, Foothill Pipeline together with Santa Ana River Connector Pipeline are the most vulnerable facilities if a major earthquake were to occur along the San Andreas Fault and the most critical during a catastrophic interruption. The following systems could provide some alternative conveyance of surface water should portions of the Foothill Pipeline System fail:

- Metropolitan's Inland Feeder can provide redundancy of the Foothill Pipeline to the intertie at Opal Avenue. The Inland Feeder could also be used to pump water from Diamond Valley Lake north to the intertie with the Valley District Foothill Pipeline. The conveyance capacity of the Inland Feeder operating from Diamond Valley Lake to the north is reported to be 250 cfs.

- The proposed conjunctive use project would include facilities that could convey stored groundwater from the San Bernardino Basin Area to purveyors as a substitute for imported water.

2.2.4 Additional Surface Storage

If the ability to import SWP water is lost or the region is faced with major interruption of regional and local facilities due to a catastrophic event, it is important to have ample local surface storage to meet immediate water demands. While there may be significant water stored below ground, the ability to extract and deliver this water may also be disrupted by a catastrophic event. The following suggestions could further prepare the Region for such an emergency:

- Inventory surface water storage facilities throughout the region and determine the amount of existing storage capacity compared to need to satisfy emergency water

demands. The Valley District should conduct an evaluation of feasible storage needs for the Region.

- Select appropriate delivery methods for the waters (i.e., trucking or alternative or backup pipelines).
- Rank agencies by their current amount of surface water storage and their operating storage amounts to determine which areas of the Region are in need of additional surface storage. (How far would people have to walk or drive to get to water? Which cities or communities are most at risk for water shortages?)
- Investigate adding additional local surface water storage facilities that could supply water to the entire Region in the event of an emergency. (North and South Lake projects and conservation pool behind Seven Oaks Dam.)

3 Vulnerability of Region's Water Supply System to SWP Supply Interruption

The scenario considered by this document is a large earthquake along the San Andreas Fault severing the State Water Project (SWP) California Aqueduct just above Devil Canyon power plant. In addition to the threat of earthquake, a disruption on the SWP could be caused by levee failure in the Sacramento-San Joaquin Delta or by other disruptions in transmissions facilities. These two disasters would have an impact on the delivery of SWP water into the region. This chapter will investigate the effects of an interruption of the SWP system on Valley District's customers.

3.1 Valley District SWP Deliveries

Deliveries of SWP water to Valley District have averaged approximately 15,000 acre-feet per year (1999-2003 Western-San Bernardino watermaster records). San Gorgonian Pass Water Agency is also receiving SWP water that would be affected by interruption of SWP deliveries. These direct deliveries are projected to increase to 34,000 acre-feet per year by 2030 based on the UWMP projections within the Region. Historically, direct deliveries have peaked during summer months with the greatest deliveries in July, August, and September. In the event that State Water Project deliveries are severely reduced, more demand will be placed on local groundwater supplies. For example, in a one-month shutdown, additional demands on groundwater within the Valley District service area would be 3,000 to 6,000 acre-feet (current to future demands, shut down in the summer); in a six-month shutdown, additional groundwater demands would be 10,000 to 30,000 acre-feet (current to future demands, shut down in May to September); and in a 12-month shutdown, additional demands on groundwater would be 15,000 to 34,000 acre-feet (current to future demands).

3.2 Overview of Known Earthquake Vulnerabilities of State Water Project

Publications available from the Department of Water Resources address the institutional requirements of responding to an emergency.

3.2.1 California Division of Mines and Geology Planning Scenarios

The California Division of Mine and Geology planning scenario for a major earthquake on the San Jacinto Fault concludes that the Santa Ana Valley Pipeline of the SWP will be damaged extensively as the fault and pipeline cross several times.

The planning scenario for a magnitude 8.3 earthquake north of the San Bernardino area and on the San Andreas Fault concludes that though all of the SWP facilities of the California Aqueduct are designed to resist the effects of a great earthquake comparable to the scenario event, widespread damage to the aqueduct will inevitably occur. For planning purposes, a minimum of three months will be required to accomplish those repairs necessary to restore water deliveries to southern California. Severe damage to the East Branch where it crosses the San Andres Fault at Barrel Springs is expected. No major damage to aqueduct facilities between Lake Silverwood and the Devil Canyon Power Plant is expected (this scenario assumes that surface fault rupture would terminate some 25 km northwest of Devil Canyon). The Santa Ana Valley Pipeline would be subjected to intense shaking and possible ground failure.

3.2.2 Seismic Risk Analysis for California State Water Project – Reach C

The objective of this study (Shah, 1976) was to develop a seismic hazard map for the east branch of the SWP. The study concluded that with respect to the pumping and power plants, the hazard or probability of exceeding the design load level employed for the substructures and superstructures during the next 50 years was very small (on the order of 5 percent). For the switchyards, however, the probability of exceeding their design load level during the next 50 years is large (on the order of 30 to 60 percent).

The following recommendations were made as a result of the above study.

- "The risk of damage or destruction to the pumping and power plant substructures and superstructures is minimal during the next 50 to 100 years, and therefore no action is required. However, for the mechanical and electrical equipment within these plants it is recommended that a thorough survey be made to evaluate their ability to resist seismic loads."

- "All switchgear equipment should be modified so as to resist a minimum peak ground acceleration of 0.3 g. This load level corresponds to a return period of approximately 200 years or more along [the East Branch]."

- "Since the ground shaking along the Santa Ana Valley pipeline is relatively high, in excess of 0.5 g for a 1000 year return period), an investigation should be made to determine the advisability of providing a cut-off facility for this portion of the [East Branch]."

- "Because of the large risk potential, a central operations and maintenance center with facilities and capabilities for dealing with earthquake induced damage should be set up for the region south of the Devil Canyon Power Plant."

3.3 Finding and Recommendations

Valley District currently requires the agencies it serves to have a back-up water supply in case the State Water Project (SWP) supply is not available. Assuming the back-up supply is groundwater produced from the San Bernardino Basin Area (SBBA), 15,000 additional acre-feet per year of groundwater production would be needed if the earthquake happened in the near future, and potentially 34,000 acre-feet of additional groundwater production if the earthquake happened around 2030.

The average instantaneous pumping rate for the 199 wells (with data available) of the major water purveyors in the SBBA is approximately 1,438 gpm. Based on well production rates at 70 percent of their instantaneous pumping rate, annual production would be about 323,100 acre-feet. For the remaining wells without instantaneous pumping rate data, the total maximum annual production between 2001 and 2005 was about 60,800 acre-feet. This yields a total maximum annual groundwater production capability of 383,900 acre-feet. The projected actual groundwater pumping for the Baseline Run 1 ranged from between 193,200 acre-feet in 2010 to 289,100 acre-feet in 2034, with an annual average of 248,900 acre-feet per year for the period 2006-2044. Thus, the additional groundwater production that could be used if the state aqueduct was severed is approximately 95,000 acre-feet (383,935 – 289,105) which is greater than the estimated 2030 need of 34,000 acre-feet. The 95,000 acre-feet represents approximately 9 percent of the 1,000,000 acre-feet of usable storage in the SBBA.

In the event of a SWP shutdown, there is sufficient groundwater storage, production facilities and transmission facilities to likely provide short-term water deliveries to customers in the Valley District service area. To prepare for such an outage, SWP and local supplies should be stored in the local groundwater basins, whenever available.

3.3.1 Pipeline Redundancy

Pipeline redundancy in the region is important if interruption occurs in the region along the Foothill Pipeline. On a regional-scale, projects like the Baseline Feeder, the proposed conjunctive use project and the MWDSC Inland Feeder provide additional options of conveyance in an emergency situation.

Although a loss of SWP water for a short period of time can be overcome, the SWP is critical to long-term management of the groundwater basin. The following suggestions are intended to help further prepare the Region for a shutdown of the State Water Project.

3.3.2 Recharge with SWP Water when it is Available

The SBBA is essentially an underground storage reservoir that contributes to the water reliability of the Region during periods of drought. By recharging water from the SWP when it is available, the Region can prepare in advance for drought or disruptions in the SWP

system. This is a primary management strategy of the San Bernardino Valley Regional Urban Water Management Plan and the Upper Santa Ana River Watershed Integrated Regional Water Management Plan.

3.3.3 Surface Storage in the Region

Additional surface storage in the region can help provide water supplies during a catastrophic failure of the California Aqueduct.

3.3.4 Exchange and Banking Program Utilizing Santa Ana River Water

In years when water available from the Santa Ana River exceeds the capacity of local treatment plants and spreading grounds, the excess amount could physically be delivered to the Inland Feeder and into Metropolitan's water system in exchange for SWP water from Metropolitan. This banked water could be recovered and delivered to the region if a catastrophe occurs along the California Aqueduct.

4 Vulnerabilities of Local Purveyors Water Supply System to an Earthquake in the Region

A catastrophic 8.0 earthquake near San Bernardino could lead to pipeline rupture, loss of electricity, and well failure, substantially reducing water supplies available in the Region. The quality of both surface and groundwater supplies could also be affected by the failure of existing wastewater treatment facilities. Figure AF-1 shows the San Andreas Fault trace through the Valley District service area with a five mile fault buffer zone. In the case of a 7.8 earthquake, anything within five miles of the fault is likely to be damaged or destroyed (Caltech meeting, July 31, 2007). In addition, regional infrastructure within this zone includes the SWP CA Aqueduct coming from Lake Silverwood to Devil Canyon, regional water facilities owned by Valley District (Foothill Pipeline, Greenspot Pipeline, Lytle Canyon Pipeline, and the East Branch Extension), and Metropolitan's Inland Feeder will be impacted. Prudent preparation for a catastrophic earthquake would suggest planning for no water deliveries from the SWP.

4.1 Overview of Known Earthquake Vulnerabilities of Purveyor's Systems

This section has been prepared based on review of Urban Water Management Plans of agencies receiving direct deliveries from Valley District. California Water Code Section 10632 (c) requires that Urban Water Management Plans address catastrophic supply interruptions.

4.1.1 San Bernardino Municipal Water Department

San Bernardino Municipal Water Department's Supplemental Emergency Plan is designed for implementation during emergency water shortages that could occur as a result of earthquake, flood, fire, or other catastrophes. SBMWD maintains portable backup power supply and diesel- and/or natural gas-driven wells at critical locations within the distribution system to provide domestic water for emergency purposes during sustained power outages. Additionally, they have entered into a Mutual Aid Agreement with surrounding water agencies.

4.1.2 East Valley Water District

East Valley has in place back-up power supplies at critical locations within the distribution system. The District maintains portable pumps that can be used to transfer water between zones, but cannot be used for production. East Valley's storage capacity of 25.5 million gallons would provide a potable supply for customers' non-irrigation uses (assumes

implementation of Water Shortage Contingency Plan) for an estimated two to three days. A Mutual Aid Agreement with surrounding water agencies is also in place for the provision of water supply and/or manpower.

East Valley has an agreement with Arrowhead Drinking Water Company to deliver potable water tanks to selected sites within the District's service area. The trucks will be manned by District personnel to distribute water to customers for drinking purposes.

Were surface water deliveries to East Valley disrupted, East Valley has adequate groundwater production capacity to meet peak day. This presumes that East Valley's facilities remained intact.

4.1.3 West Valley Water District

Extended multi-week supply shortages due to natural disasters or accidents that damage all West Valley water sources are unlikely. The District's 23 storage reservoirs hold 65.6 million gallons, which is sufficient water to meet the health and safety requirements of 50 gallons per day per capita for the 60,121 customers for 21 days. This assumes zero non-residential use. Under emergency power outages or catastrophic earthquake conditions, the existing storage is expected to provide a minimum supply of 3.5 days of average day demand or 1.7 days under maximum summer demand.

The District is planning to construct an additional 12.5 million gallons of storage within the next few years for a total of 78.11 million gallons, which would give the District 4.2 days of average day demand. The District also has interconnections with three other agencies for emergency supplies.

The District has portable back-up generators that can be used in the event of an area-wide power outage. These generators can be located on both wells and booster stations to continue water production. These generators will be located in the northern part of the distribution system. Water can then be boosted to higher zones or gravity fed to the lower zones. In addition to the portable generators, the District is constructing back-up generators at the Zone 5 and 6 booster stations.

West Valley's groundwater production capacity is approximately 80 percent of peak day demand. It obtains water from two Valley District facilities, the Lytle Pipeline and the Baseline Feeder. These facilities are required to meet peak day demand.

4.1.4 Yucaipa Valley Water District

Yucaipa Valley's Major Disaster Plan and Alerting Procedures deal with non-drought-related water shortages, including those that might result from earthquakes. It outlines the responsibilities of the District's designated emergency response personnel, alerting

procedures, alternate headquarters, communications, transportation, and relationships with regional and state emergency response officials.

To the extent well capacity exists, the Yucaipa basin can be temporarily exercised beyond its long-term safe yield in response to shortages.

It is East Valley's intent to maintain groundwater production facilities adequate to meet peak day demand without use of surface water.

4.1.5 City of Redlands

The Redlands UWMP notes that the Redlands Municipal Utilities Department has an emergency plan that supplements the Citywide Emergency Plan. It notes that in case of an earthquake, required actions are to "coordinate the resources necessary for repair of water infrastructure," and to "utilize vendor lists to identify available water haulers, temporary water lines, piping, heavy equipment, etc."

Redlands does not have adequate capacity to meet peak day demand without use of surface water. Redlands obtains surface water from Mill Creek and SWP wheeled by SBVWMD. During a typical summer, Mill Creek is the main source during early summer, but this supply is substantially reduced by late summer. SWP water is the dominate source in late summer. Depending on the supply of Mill Creek water, Redlands may not be able to meet peak day demands without SWP water.

4.1.6 Fontana Water Company

Fontana is dependent on imported surface water to meet demands. Presently, the water is all delivered via the Lytle Pipeline. It is possible that in the future, some of the imported water will be conveyed by Metropolitan's Foothill Feeder (also known as the Rialto Pipeline). These two lines are parallel, however, and it is reasonable to presume that the same event that damages one will damage the other.

4.1.7 City of Rialto

Rialto's UWMP notes that the city's storage reservoirs can meet the health and safety requirements of 50 gallons per day per capita for 11 days. This assumes no non-residential use. The City is retrofitting key well sites to enable the City to bring in portable generators for use during a power outage.

Rialto obtains water from two Valley District facilities, the Lytle Pipeline and the Baseline Feeder. It is believed that both these facilities are required to meet peak day demand.

4.2 Findings and Recommendations

- The purveyors in the region will primarily rely on groundwater during catastrophic events. Therefore, they must ensure they have reliable and adequate backup power supplies at critical locations within the distribution system as well as key production wells. The backup power supplies should be tested periodically to ensure proper operations during emergencies.

- Local purveyors should examine their current storage and interties capacities and plan for additional storage and interties to ensure adequate water supply is available for health and safety during catastrophic events.

5 Summary of Findings and Recommendations

5.1 Findings

These findings have been developed from a search of literature reporting the impacts of major earthquakes and limited work by water purveyors. More detailed, site-specific analyses are needed to better quantify and identify impacts from major earthquakes or other catastrophic outages.

- **Reliability of Groundwater Wells.** Review of post-earthquake lifeline performance reports reveals little discussion of groundwater well failure. However, loss of commercial power, damage to electrical equipment and aboveground appurtenances, or damage to the distribution system may effectively put the well out of service. Liquefaction, especially in areas where there is high groundwater levels between depths of 5 to 50 feet, may cause ground settlement and interfere with continued well operation.

  No discussion of the performance of well head treatment systems during earthquakes was found. This may be due to the limited amount of well head treatment in place during prior earthquakes. As well head treatment typically includes purchased equipment installed in a field location, there is significant opportunity for lapses in the seismic design.

  The groundwater basin and the groundwater production wells are a reliable part of the water supply system for the San Bernardino area.

- **Reliability of Pipelines**. Pipelines are generally the most fragile part of a water system. Generally, damage is a function of displacement rather than shaking. Empirical algorithms have been developed to predict seismic reliability of pipelines.
- **Reliability of Pump Stations**. Past earthquakes indicate that the structural and mechanical elements of a pump station are highly resistant to earthquake damage. The most likely failures are to the electrical equipment and loss of commercial power.
- **Reliability of Surface Water Treatment Facilities**. The major elements of a surface water treatment system are typically concrete structures that are very resistant to damage. However, these facilities include a large variety of mechanical equipment, much of it long and light weight that is subject to damage not only from the direct force of an earthquake, but also to the wave action created by the earthquake. Similar to a pump station, power supply and electrical equipment are fragile.

- **Reliability of the State Water Project**. While little specific information was found on anticipated damage to the SWP, the high susceptibility of the Santa Ana Valley Pipeline is recognized. A major vulnerability of the SWP is the Sacramento-San Joaquin Delta. The SWP does have a Business Resumption Plan and an Emergency Operations Plan.
- **Length of Outages.** The Loma Prieta earthquake affected a large number of separate systems. The San Jose Water Company serves most of San Jose and all of Los Gatos. Los Gatos was hard hit and half of the water customers lost water service. In San Francisco, the worst hit area was the Marina District. Fires and liquefaction both affected the district. East Bay Municipal Water District serves 1.1 million customers and suffered $3.7 million in damage. Damage included a break in a 60-inch raw water line.

  After the Northridge earthquake, the Los Angeles Aqueducts No. 1 and 2 were in and out of service for temporary and permanent repairs over several months, these facilities were not critical at that time. Alternate supplies were available and drought conditions limited supply to these aqueducts.

  Table AF-3 shows the length of outages for water operation during the Loma Prieta and Northridge earthquakes.

  Valley District's Emergency Operations Plan includes estimates for repair of Valley District facilities. Electrical and pipe repairs are estimated to take 35 to 77 days. Pump repairs are estimated to take 168 to 273 days.

  Tables AF-4 and AF-5 summarize the degree to which purveyors depend on Valley District facilities for deliveries over a period of days to one year. These tables presume normal operations by the purveyor with the exception that non-potable deliveries (West Valley and Yucaipa) are suspended.

Table AF-3 – Length of Outages for Water Operation during Loma Prieta and Northridge Earthquakes

Earthquake	Purveyors	Time to Restore Water Operation
Loma Prieta	San Jose WC	36 hrs/98%
	San Francisco	6 days/most areas
	East Bay MWD	3 days/normal operation
Northridge	City of L.A.	12-65 days

Table AF-4 – Percent of Present (P) and Future (F) Peak Day, Potable Demand conveyed by SBVWMD facilities when no local surface water is available. Assumes imported water used prior to local groundwater

Purveyor	Foothill Pipeline	SARC Pipeline	Greenspot Pump Station	Morton Canyon Connector	Greenspot Pipeline	Tate Pump Station	Crafton Hills PS	Crafton Hills Reservoir	Crafton Hills Pipeline	Bryant Street Pipeline	Yucaipa Pipeline	Lytle Pipeline	Baseline Feeder
San Bernardino Municipal Water Dept	0	0		0	0								
East Valley Water District	12 (P) 24 (F)	12 (P) 24 (F)		12 (P) 24 (F)	0								
Redlands	36 (P) 41 (F)	36 (P) 41 (F)	24 (P) 25 (F)	51 (P) 35 (F)	24 (P) 25 (F)	24 (P) 25 (F)							
Yucaipa Valley Water District	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)		24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	0		
Fontana Water Company	0	0		0	0							unknown	
West Valley Water District	0	0		0	0							23 (P) 36 (F)	12(P) 27 (F)
City of Rialto	0	0		0	0							7 (P) 6 (F)	unknown

Notes:
San Bernardino Municipal Water Department figure does not include deliveries of surface water for wells under the influence of surface water as it takes six to seven months for the hydrographs of these wells to respond. If these deliveries were included, they would be 14% of peak day demand.
Does not include deliveries for irrigation or indirect deliveries.
Gray shading indicates a conveyance facility that cannot under any circumstances be used to convey water to the agency.

Table AF-5 – Groundwater and Local Surface Water Production Capacity as percent of peak day demand

Purveyor	Percentage	Remarks
San Bernardino Municipal Water Department	113%	
East Valley Water District	104%	
Redlands	≈ 75 to 85%	Assumes late summer when local surface water supplies are low. When local surface water supplies are high, Redlands can produce approximately 85 to 95% of demand.
Yucaipa Valley Water District	95%	Yucaipa's intent is to maintain groundwater production facilities adequate to meet peak demand. As of August 2007, they do not meet this goal.
Fontana Water Company	Significantly less than 100%	
West Valley Water District	78%	Projected to decrease to 59% in the future.
Rialto	unknown	
Notes: Does not include non-potable use by West Valley and Yucaipa.		

5.2 Recommendations for Disaster Preparedness

This section includes the consultants recommendations based on the literature review and discussions with District staff and purveyors. The following recommendations have not been included in the administrative draft of the IRWM Plan. After these recommendations, the projects already included in the IRWM Plan that would enhance disaster preparedness will be reviewed.

5.2.1 General Recommendations

- Consider a Seismic Improvement Program/Water Infrastructure Reliability Project to review the adequacy of Valley District facilities to withstand an earthquake. East Bay Municipal Utilities District and Santa Clara Valley Water District (Santa Clara Valley Water District, 2005) are two agencies that have performed such studies. High priority facilities include Foothill Pipeline, Santa Ana River Connector, Morton Canyon Connector, and Greenspot Pipeline.
- Consider the opportunities that Big Bear Lake presents as an emergency source of water after an earthquake that interrupts SWP deliveries for many weeks.
- Consider using the existing MWD agreements to allow the use of Metropolitan Water District facilities to bypass failed Valley District facilities (and the reverse).

- Review ability to provide drinking water immediately following an earthquake. Arrangements to provide bottled water may be appropriate.
- The USGS Multi-hazards Demonstration Project (MHDP) is leading an effort to create a scenario document for a future M7.8 southern San Andreas Fault earthquake. The document will describe in detail the effects of the earthquake. It will form the basis for a November 2008 statewide earthquake response exercise. The USGS contact for this project is Dale Cox, dacox@usgs.gov, 916/997-4209. It is probable that useful information for disaster preparedness planning will come out of this effort.

5.2.2 Proposed Projects to Provide Conveyance System Redundancies for the Regional Facilities

The proposed conjunctive use project could provide the backup well production needed for the retail water agencies in an emergency when SWP supplies have been severed.

5.3 Alternative Local Supplies

This section is intended to initiate a discussion of options that would improve the water supply reliability in case of a catastrophic failure of portions of the Valley District water system.

5.3.1 Interties between Purveyors

Table AF-6 lists interconnections between purveyors. These interties could be used to balance supplies between purveyors. An interconnection between the City of San Bernardino and East Valley is currently being used to facilitate blending. This use is anticipated to end in the near future. Fontana Water Company has historically depended on supplies delivered through its interconnection with Cucamonga Valley to meet peak day demand.

Table AF-6 – System Interties between Purveyors

Transfer	Direction	Capacity (MGD)	Remarks/data source
City of San Bernardino/East Valley	Either	4	Three interties. One currently used to facilitate blending.
City of San Bernardino/Riverside	To San Bernardino	2	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/West Valley	Either	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Loma Linda	Either	5	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Colton	To Colton	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Rialto	Either	3.6	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/ Riverside Highland	To Riverside/ Highland	3	(San Bernardino UWMP, Pg 2-10)
Fontana/Cucamonga Valley	Either	3.6	Fontana UWMP (2500 gpm)
West Valley/Fontana	Either		West Valley UWMP.
West Valley/Rialto	Either		West Valley UWMP.
West Valley/Colton			West Valley UWMP.
Redlands/Loma Linda	To Loma Linda		Greg Gage
Rialto[1]/Marigold	To Marigold		Rialto has historically conveyed 1,500 afy of groundwater to Marigold. The agreement under which this was accomplished is expiring.

Sources: San Bernardino Municipal Water Department 2005 UWMP; Jack Nelson, Yucaipa Valley; Ron Buchenwald, East Valley; Greg Gage, Valley District, West Valley 2005 UWMP.

[1] Rialto has several connections with other systems, including four connections with West Valley Water District, and connections with the City of San Bernardino, Fontana Water Company, and Riverside Highland Water Company.

Based on the limited sources of data, this list may be incomplete.

5.3.2 Big Bear Lake

Big Bear Lake has a capacity of over 70,000 acre-feet, most of which is owned by the Bear Valley Mutual Water Company. To enhance tourism, Big Bear Municipal Water District entered into an agreement with BVMWC and Valley District whereby Valley District makes deliveries to BVMWC "in lieu" of BVMWC taking delivery from the lake. The net effect is that water remains in the lake to enhance tourism. An agreement could be written that might make water from the lake available for municipal use in case of a catastrophe.

5.3.3 Increased Groundwater Production Capacity and Reliability

If the catastrophe is an earthquake, the most likely impact on groundwater production capacity will be damage to the electrical system of the well or to the electricity supplier's system.

Thus, providing emergency generators for "key" wells would help improve the area's ability to operate after a catastrophic failure.

5.4 Alternative Conveyance of Surface Water

5.4.1 Alternatives to Foothill Pipeline System

The following systems could provide some alternative conveyance of surface water should portions of the Foothill Pipeline System fail:

- Metropolitan's Inland Feeder parallels the Foothill Pipeline from Devil Canyon to Opal Avenue. The Inland Feeder could also be used to convey water stored in Diamond Valley north to the Valley District service area. The conveyance capacity of the Inland Feeder operating from Diamond Valley Lake to the north is reported to be 250 cfs.

- The proposed conjunctive use project would increase the ability to convey groundwater between agencies following a catastrophe.

- The proposed East Branch Extension Phase II will convey SWP water from the eastern portion of the Foothill Pipeline to Crafton Hills Pump Station. This will provide redundancy for the SARC Pipeline, Greenspot Pump Station, Morton Canyon Connector I, and Greenspot Pipeline.

5.4.2 Alternatives to the Lytle Pipeline

- Metropolitan's Foothill Feeder, also called the Rialto Pipeline, parallels the Lytle Creek Pipeline from Devil Canyon east for approximately nine miles. With turnouts it could provide alternative conveyance to West Valley's and Fontana's surface water treatment plants.

- The Baseline Feeder conveys groundwater to West Valley and Rialto. This groundwater is an alternative to SWP water conveyed by the Lytle Pipeline. It should be noted that Rialto's connection to Lytle Pipeline is not yet completed.

5.4.3 Alternatives to Baseline Feeder System

- The Lytle Creek Pipeline conveys SWP water to West Valley and can convey SWP water to Rialto when the connection is completed. This surface water is an enhancement to groundwater conveyed by the Baseline Feeder.

5.5 Back-Up Power Supplies

5.5.1 Power Supplies for Groundwater Wells

A catastrophic earthquake may cause loss of electricity for an indeterminate amount of time. In order to ensure water supplies in the immediate aftermath and weeks following a major earthquake, it is critical to have back-up generators or internal combustion engines for important production wells throughout the Region.

- Inventory wells in the Region with back-up generators.
- Determine the number of wells that could be equipped with internal combustion engines.
- Rank groundwater wells by their ability to supply water to purveyors. Wells with higher production capacities, more conveyance connections, or delivery pipeline options are preferential.
- Select a distribution of wells across the basin to be provided with back-up generators or internal combustion engines, decreasing the likelihood of a localized event impacting a majority of the most important wells.

5.5.2 Back-Up Power Supplies for Other Water Supply Facilities:

Similar evaluations should be conducted for other facilities such as water treatment plants and the key pumping plants, and back-up power generation should be put in place for use during emergencies.

6 Water Shortage Contingency Plan

Each water agency in the region is required by law to have a water shortage plan and emergency catastrophe plan. If there is a shutdown in the SWP system or a long-term drought that affects imported or local supplies, each agency in the region should participate in conservation activities that maximize use of the shared water supplies, both local surface water and ground water. These conservation efforts should be coordinated at a regional level.

The following provides examples of rules, regulations, and procedures that could be implemented to restrict or reduce water use. These could be implemented upon determination that there exists, or there is a threat of, a water shortage that affects the region's ability to provide adequate potable water supplies for the purveyors to deliver to their customers. Each agency should have a water shortage plan that is tailored to their customers in order to reach water conservation targets.

6.1 Stage I Conservation – Additional 20% Reduction

Upon determination that additional water conservation is needed, the following prohibitions can be considered and adopted with the goal of achieving an additional **20 percent** reduction in water consumption—the water conservation measures referenced in Stage I, and the following:

(a) All outdoor irrigation should occur only after 8 p.m. and before 7 a.m.

(b) Prohibit the use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground, and other hard-surface areas by direct application.

(c) Prohibit the use of non-drinking-water fountains, except for those using recycled water.

(d) Prohibit the use of water that results in any flooding or run-off in gutters or streets. Limit water deliveries to residential and non-residential users to 90 percent of their water consumption for the same billing cycle during a pre-determined Base Year.

(b) Levy a surcharge of **200 percent** on all water use in excess of the maximum water use allotment referenced in subparagraph (a) above, assessed to the account of the customer.

(c) Limit the use of water from fire hydrants to fire suppression and/or other activities immediately necessary to maintain health, safety, and welfare of residents.

(d) Prohibit the use of potable water for dust control and compaction for construction projects.

(e) Prohibit the washing of automobiles, trucks, trailers, boats, and other types of mobile equipment not occurring upon the immediate premises of a commercial car wash and/or commercial service station that uses recycled water.

(f) Encourage restaurants to refrain from serving water to their customers, except upon specific request.

(g) Limit the use of potable water to irrigate grass, lawns, ground cover, shrubbery, crops, vegetation, ornamental trees, etc., to Saturdays, Mondays, and Wednesdays for even-numbered addresses and Sundays, Tuesdays, and Thursdays for odd-numbered addresses, or as otherwise established by resolution from the Board of Directors of the respective agencies.

(h) Limit water main flushing to emergency situations only.

(i) Wait list applications for Intent to Serve Letters and suspend their further processing.

Pursue a vigorous public information campaign regarding current water supply conditions and the need to reduce water consumption by such means deemed appropriate.

Meet with other water purveyors, public school districts, park agencies, and golf courses that use water sources other than purveyor-supplied water, to seek voluntary reduction in irrigation of decorative landscape and reduce irrigation of turf and play areas.

In addition to those measures stated above, adoption of water conservation measures on an urgency basis may be warranted.

6.2 Stage II Conservation – Additional 35% Reduction

Upon determination that additional water conservation is needed, the following prohibitions can be considered and adopted with the goal of achieving up to an additional **35 percent** reduction in water consumption. The water conservation measures referenced in Stage I and Stage II, and the following:

(a) Limit water deliveries for residential uses to **65 percent** of their water consumption for the same billing cycle during a pre-determined Base Year.

(b) Levy a surcharge of **400 percent** on all water use in excess of the maximum water use allotment reflected in subparagraph (a) above, and that can be assessed to the account of the customer.

(c) Require all swimming pools to be covered when not in use.

(d) Prohibit the use of potable water to irrigate grass, lawns, ground cover, shrubbery, crops, vegetation, ornamental trees, etc., and lock all irrigation meters.

(e) Suspend Intent-To-Serve Letters. However, the expiration period can be extended commensurate with the time of suspension.

In addition to those measures stated above, adoption of water conservation measures on an urgency basis may be necessary.

6.3 Stage III Conservation – Additional 50% Reduction

Upon determination that additional water conservation is needed, the following prohibitions can be considered and adopted with the goal of achieving up to an additional **50 percent** reduction in water consumption. The water conservation measures referenced in Stage I, II, and III above, and the following:

(a) Limit water deliveries for residential uses to **50 percent** of their water consumption for the same billing cycle during a pre-determined Base Year.

(b) Levy a surcharge of **500 percent** on all water use in excess of the maximum water use allotment reflected in subparagraph (a) above, and that can be assessed to the account of the customer.

(c) Prohibit the setting of new water meters and suspend all Will-Serve Letters.

In addition to those measures stated above, adoption of additional water conservation measures on an urgency basis may be necessary.

References

Ballantyne, Donald. Water System Performance in the Great Hanshin (Kobe) Earthquake.

Ballantyne, Donald. 1995. Relative Earthquake Vulnerability of Water Pipe. Dames & Moore, Inc. July 26, 1995.

Ballantyne, Donald B and Crouse, C.B. 1997. Reliability & Restoration of Water Supply Systems for Fire Suppression & Drinking Following Earthquakes. GCR 97-730. National Institute of Standards and Technology. November 1997.

Ballantyne, Donald B. Comparison of Water Utility Earthquake Mitigation Practices.

California Department of Conservation, Division of Mines and Geology. 1982. Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in Southern California, Special Publication 60. 1982.

California Department of Conservation, Division of Mines and Geology. 1993. Planning Scenario for a major Earthquake on the San Jacinto Fault Zone in the San Bernardino Area, Special Publication 102. 1993.

California Department of Water Resources. 2006. Emergency Response Plan.

California Department of Water Resources. Business Resumption Plan. September 2006.

Chung, Riley M, Jason, Nora H. Jason, Mohraz, Bijan, Mowrer, Frederick W., and Walton. William D (editors). 1995. Post-Earthquake Fire & Lifelines Workshop: Long Beach. CA. NIST Special Publication 889. National Institute of Standards and Technology. August 1995.

Collins, Frank, Conner Michael Eidinger, John M. and Tomasulo, Jim. Pipeline Performance in San Diego due to Earthquakes. March 28, 2001.

Degner, Joel, Pappas Alex, IRGMP Study Area Vulnerability to an 8.0 Earthquake on the San Andreas Fault, September 14, 2007

Eidinger, John, Yashinsky, Mark and Schiff, Anshel. 2000. Napa M5.2 Earthquake of September 3, 2000. September 13, 2000.

Fialko Y., Rivera L. , and, Kanamori H. (2005) Estimate of differential stress in the upper crust from variations in topography and strike along the San Andreas fault . *Geophysical Journal International* 160 (2), 527–532

Gilbert, Jerome B, Dawson, Artis L., and Linville, Thomas J. Bay Area Water Utilities Response to Earthquake. Prepared for East Bay Municipal Utility District.

Housing and Urban Development, Department of. 2000. Preparing for the "Big One": Saving Lives through Earthquake Mitigation in Los Angeles, California. http://www.huduser.org/publications/destech/bigone/

JELC Working Committee. 2000. Final Report, Provision of Water. May 2000.

Los Angeles Fire Department. Northridge Earthquake January 17, 1994. http://lafd.org/eq.htm.

Lund, Le Val. Lifeline Performance, San Simeon Earthquake, December 22, 2003. http://www.asce.org/pdf/sansimeon.pdf

Pickett, Mark A, Laverty, Gordon L., Abu-Yasein, Omar A., and Chen Wun Lay. Loma Prieta Earthquake: Lessons Learned for Water Utilities.

Riordan, Raymond A. Sending Mutual Aid to Northridge: More than Main Repairs. Prepared for East Bay Municipal Utility District.

RMC Water and Environment. 2005. Executive Summary, Water Infrastructure Reliability Project Report prepared for Santa Clara Valley Water District, May 2005.

Schiff, Anshel J. (ed). 1998. The Loma Prieta, California. Earthquake of October 17, 1989 – Lifelines. U.S. Geological Survey Professional Paper 1552-A.

Schiff, Anshel J. 1997. Northridge Earthquake: Lifeline Performance and Post-Earthquake Response. Mational Institute of Standard and Technology.

Vancouver, City of. 2007. Alternate Water Supplies. http://www.city.vancouver.bc.ca/engsvcs/waterserwers/altenatve.htm/

Water Supply Panel. Assessing the Impacts of a M7.8 Southern San Andreas Earthquake on Water Supply. 7/31/2007 meeting at the California Institute of Technology

Water Supply Contingency Work Group. July 2007 sketch.

Yashinsky, Mark and Eidinger, John. Performance of Lifelines during the November 3, 2002 Denali, Alaska Earthquake. http://www.asce.org/pdf/denaliearthquake.pdf

Conversations with:

Sam Fuller, San Bernardino Valley MWD, July 2007
Ron Buchwald, East Valley, August 2007
Tom Crowley, West Valley, August 2007. Email on August 28.
Chris Diggs, Redlands, August 2007
Jack Nelson, Yucaipa Valley, August 2007
Matt Litchfield, August 2007

2005 Urban Water Management Plans:

East Valley Water District
Fontana Water Company
City of Redlands
West Valley Water District
Yucaipa Valley Water District

Attachment 1

Earthquake Literature Search

This section has been prepared based on the insights included in reports prepared by water agencies outside this IRWM Plan area that summarize their experience and include their after-action reports prepared following earthquakes.

Loma Prieta, California, Earthquake of October 17, 1989.

The U.S. Geological Survey's Professional Paper on the performance of the built environment in the Loma Prieta Earthquake was compiled of a number of separate papers. Information from two of those papers that focused on water systems is discussed here (Schiff, 1998).

A section of the Professional Paper (Le Val Lund, primary author) had the following conclusions:

"On the basis of this preliminary reconnaissance survey, the 1989 Loma Prieta earthquake has reinforced the lessons learned in previous earthquakes that water and wastewater systems should do the following.

- Provide emergency power for critical operating, treatment, and support facilities
- Maintain portable light plants, generators, chlorinators, and pumps
- Develop a separate radio-communication system, independent of the telephone system
- Maintain an inventory of repair materials, parts, and fuel
- Improve the State-wide and mutual-aid programs
- Establish guidelines for State-wide emergency water-quality sampling and public notification
- Conduct an earthquake-response assessment of system facilities
- Develop an emergency-response plan
- Incorporate into local or regional emergency-response plans a more active participation by water and wastewater agencies
- Provide a method, possibly computer based, for logging problems and system operations to establish priority for repair activities
- Conduct a cross-training program to include all personnel in emergency response
- Train personnel in appropriate communication procedures
- Conduct regular periodic emergency-response exercises
- Provide flexible pipe joints
- Provide flexible pipe connections to wells, tanks, pumps, and other rigid structures

- Provide adequate anchorage for air valves and other heavy appurtenances that are installed in an inverted-pendulum position
- Design mechanical appurtenances in treatment-plant basin facilities for wave action
- Provide for a breakaway or fusible connections and (or) safety cables or chains to prevent malfunctioning mechanical equipment from interfering with other equipment in treatment-based basins
- Provide for redundancy in water and wastewater systems
- Install isolation valves and establish a regular valve-maintenance program
- Anchor water-quality-testing equipment and supply cabinets"

A separate section of the Professional Paper (Mark Pickett, primary author) focused in part on the lessons learned from the Loma Prieta Earthquake for utility operations, including preparedness and response. A brief review of the points made on utility operations is below:

- **Organization**. Important improvements in organization that were frequently identified were (1) better definition of leadership roles, (2) clearer statement of unit duties, (3) improved emergency planning to reflect the detailed events that must be dealt with in real disasters, and (4) better preparation through "what if" thinking and plan exercising.
- **Energy Sources**. Points that could provide better preparedness for loss of electrical power included:
    - Maintain close relationships with the local electrical-power company to ensure priorities of the utility and the water agency are understood.
    - Portable electrical-power generators should be provided with the proper fittings and connections for each intended use. Generators should be periodically tested.
    - Permanent engine-driven generator sets should be provided at critical support facilities.
    - Regularly scheduled periodic tests should be conducted under load.
- **Portable Equipment.** All utility personnel noted that more portable equipment was needed than was on hand in their organization. Portable equipment needs scheduled maintenance and safe and accessible storage. Personnel need to know how to operate the equipment and the equipment limitations.
- **Communications and Public Information.** Pre-disaster preparation includes development of "fill-in-the-blank" media-release forms, development of procedures to disseminate information to the media, securing of communications equipment and access to communications networks, and preparation for post-disaster investigations.

- **Inventory.** Adequate supplies and access to those supplies needs to be maintained.
- **Emergency-Response Planning**. In general, utility emergency-response plans were not well documented or pre-exercised before the earthquake.
- **Mutual-Aid Planning.** Adequate mutual-aid planning includes coordination with other water agencies, participation in regional meetings and test exercises, preparation to provide aid to adjacent Federal and State organizations, and authorization from fire department officials for utilization of fire engines as booster equipment.
- **Training**. Extensive training of employees is required.
- **Long-Term Recovery Planning.** Recovery planning needs to take into account reconstruction, rate-structure changes, integration of new knowledge into operations, collection of revenues, and record keeping for State or Federal reimbursement.

Northridge Earthquake, California, Magnitude 6.8 Earthquake of January 17, 1994

The National Institute of Standards and Technology report on the lifeline performance in the Northridge Earthquake had the following observations and recommendations concerning the performance of water facilities (Schiff, 1997).

"Seismic performance of dams, large buried reservoirs, and wells in the 1994 Northridge earthquake showed significant improvement from the 1971 San Fernando earthquake. Facilities constructed since the San Fernando earthquake that incorporated lessons learned from that earthquake performed well. These include concrete tanks and pumping stations that were subjected to very strong ground motions. The prestress-concrete water tanks were constructed using criteria more conservative than those contained in AWWA Standards for Wire-Wound Circular Prestressed Water Tanks (AWWA D110)."

"There is a need for performance criteria for water systems so that piping systems and other water system facilities and equipment can be evaluated and seismic specification established in a consistent manner. With performance criteria, water systems performance and the consequences of disruption can be evaluated. With this information a case can be made for getting public support to enhance system performance in a timely and cost-effective manner."

"The largest impact on water system performance was the failure of water lines, both large supply lines and smaller lines in the distribution system. Most pipeline damage has the result of ground deformations. This earthquake had no surface faulting, but there were many areas with ground deformations in locations that had not previously been predicted. Thus, a general level of improved materials and methods may be needed to improve system performance rather than concentrating on special problems of fault crossings. The uncertainty in predicting the location of damage increases the importance of system

redundancy and alternate supplies from other sources, such as groundwater basins and alternate aqueduct systems for water supplies."

"Many of the pipe failures appear to be related to cracks in bells that are probably associated with their method of fabrication. There is a need to study the seismic strength of welded steel bell and spigot joints and methods to improve the seismic performance of the joint. The joint performance should be compared with the current (AWWA) Standard for Welded Steel Pipe."

"The performance of surface-supported tanks was poor and damage was similar to that observed in previous earthquakes. Many of the damaged tanks were old and predate current seismic design standards. The loss of tank contents was frequently associated with failure of input and output pipe connections. These failures are due to the use of cast iron fittings and inadequate flexibility to accommodate the movement of the tank, which was typically lifting rather than sliding. The roofs and upper parts of side walls on several tanks were damaged due to sloshing. Several examples of elephant foot buckling were observed."

"There is a need for follow up surveys to determine the performance of tanks constructed using current seismic standards and to determine the relative performance of anchored and unanchored tanks. Methods to address the damage due to sloshing should be identified for existing and new tanks. Based on the effect of tank performance on water system performance, the need for reducing the risk of tank damage by improving anchorage, stiffening to prevent buckling, and reducing effects of sloshing can be determined."

"Sloshing in large basins in water filtration and water reclamation plants caused damage in both 1989 Loma Prieta and the Northridge events. Although not critical, the damaged equipment can cause malfunction of other equipment. For example, sloshing caused the jamming of the chain drive sludge scrapers in seven out of 44 final clarifiers of a water reclamation plant. There is a continuing need to consider sloshing and shaking in the design of mechanical equipment and baffles in large basins of water and wastewater treatment plants."

"Air and vacuum valves on pipelines are configured in an inverted pendulum above the ground surface. In the Northridge event many valves toppled, had cracked bodies or damaged floats (balls). Also the damage may have been caused by transient pressures in the pipeline. A study is required to improve the performance of these valves in an earthquake."

"The disruption of commercial power emphasizes the need for reliable emergency power supplies. While emergency power for pumping stations and treatment plants performed well, there were indications that testing units under full load may enhance performance.

"The 1971 San Fernando and 1987 Whittier Narrows earthquakes experience had encouraged water agencies to prepare emergency response plans and establish emergency operations centers. These plans have been tested and implemented by lifeline agencies. Water system emergency response plans generally worked well in the Northridge earthquake. This was attributed to their periodic testing. It is important that plans address expected problems in communicating with personnel and with transportation problems. Because of transportation problems and the disruption of several lifelines, it is important that water system disaster plans make provisions for supporting most needs of their workers, including food and temporary housing. In the recovery after the earthquake, outside contractors may be retained to speed the recovery. It is important that all personnel be aware of OSHA requirements for entering confined spaces, such as large diameter pipes, conduits and tunnels. To improve the performance of utility work crews, utilities should consider providing support for worker families that have been directly affected by the earthquake. For example, this could include providing assistance with getting shelter or help in evaluating damage to homes."

"Boil water orders were issued as a precaution. Because of the time needed to confirm that water is safe once an order is issued, the public may be needlessly inconvenienced. Consideration should be given to developing a mobile water quality laboratory to expedite, in the field after repairs have been made, the determination if the water is safe for drinking. More rapid methods for evaluating the safety of water should be explored."

"There is a need for adequate documentation of emergency response and recovery costs. For public utilities, as is the case for most water systems, a record is needed for reimbursement from FEMA. Documentation is also needed to substantiate insurance claims."

"The disruption of the water supply demonstrated that many critical facilities were not prepared with emergency water supplies or even a means for connecting an external source into their system."

"This is a need for better public education about the consequences of water system disruption and use of appropriate mitigation measures."

"While the performance of customer water is outside of the jurisdiction of water utilities, damage to these systems was costly and disruptive in the Northridge earthquake. The Oliveview Hospital, which was reconstructed after experiencing severe damage in the San Fernando earthquake had to be evacuated due to the failure of water systems within the hospital. The vulnerability of water systems in buildings should be evaluated and standards improved to reduce the losses and disruption from these systems."

This report also addresses damage and repair of supply pipelines. Since supply pipelines are the main facilities of SBVWMD, these estimates may be of particular interest. They are summarized in Table 1.

Table 1– Repair of Supply Pipelines after Northridge Earthquake

Pipeline Description	Repair time	Remarks
54- to 33-inch modified prestressed concrete cylinder pipe	65 days	Castaic Lake Water Agency's pipeline from treatment plant to service area. 35 leaks. New fabricated sections were installed and pulled rubber gasket joints were welded in place.
SWP – West Branch, 85-inch welded steel pipe to Jensen WTP	2 days	10-foot section of damaged pipe replaced with pipe fabricated at MWD yard.
Los Angeles Aqueduct No.1		Aqueduct No. 1 had damage at four locations; and it was able to be operated at very low flow for about a week to allow repairs to Aqueduct No. 2, then shut down for repairs. Operated at one-half capacity, after temporary repairs were made, during a planned Metropolitan shutdown. It was out of service from April 1 until summer for permanent repairs.
Los Angeles Aqueduct No. 2	One week	Out of service for the first week after earthquake for repairs.
78-inch North Branch Feeder (Metropolitan)	45 days	From Jensen Plant to Simi Valley. 15 to 20 major pulled pints and 500 cracks. Replacement air and vacuum valves delivered by manufacturer in two days.
48-inch, Granada Trunk Line (LADWP)	12 days	Welded Steel Pipe and modified prestressed concrete cylinder pipe. Four major pulled mechanical couplings and two tension and compression failures.
68-inch, WSP, Rinaldi Trunk Line (LADWP)		Welded Steel Pipe. Three pulled welded bell and spigot joints and a tension and compression failure.

Santa Clara Valley Water District Water Infrastructure Reliability Project

At the time of Santa Clara's Water Infrastructure Reliability Report, the system could suffer up to a 60-day outage if a major event, such as a 7.9 magnitude earthquake on the San Andreas Fault, were to occur.

Recommended improvements to the system included:

- Life Safety – retrofit of all operations buildings
- Emergency Planning and Studies – Recovery Plan and Retailer Shortages Agreement
- Agreements – Mutual aid, contractor retainer, pipe rental companies, welder retainer, retailer incentives
- Capital Improvements – SCVWD-owned well fields
- Operational Improvements – Stockpile pipes and system materials
- SCADA Improvements

The estimated cost of these improvements was $150 million (report data May 2005). With these improvements the estimated outage period would reduce to 7 to 14 days.

San Simeon, California, Magnitude 6.5 Earthquake of December 22, 2003

The San Simeon earthquake damaged two of 19 dams in the area.

There was no reported damage to groundwater wells other than the loss of power from a few hours to several days.

Steel water tanks damaged included two in the City of Paso Robles water system, one in a private system serving a mobile home park, three (of four) at the City of Templeton, and an elevated tank in the City of Guadalupe.

Pipeline breaks were reported in most purveyor systems (Lund, 2003).

Denali, Alaska, Magnitude 7.9 Earthquake of November 3, 2002

Population near the epicenter is limited to about 10,000 people in rural locations. Nearly all residents rely on private wells for water supply. Two events of well casings ejecting out of the ground were reported. These events may be attributed to accumulated frost heave forces on casing pipe that lost its soil resistance temporarily due to shaking and/or liquefaction.

City of San Diego

In 2001, the City of San Diego completed a study of the expected operational performance of the City of San Diego Water Supply pipelines when exposed to possible future scenario earthquakes. The analysis used a specialized GIS software package.

For the most serious earthquake, the study determined that it would take 1.7 days to stabilize the system, 20 days to restore backbone pipes, 35 days to restore distribution pipes, and 74 days to complete all pipe repairs.

The study also examined the costs and benefits of different seismic improvement programs and developed benefit/cost ratios for each program (Collins, 2001).

While the City of San Diego has a large number of reservoirs in the distribution system, this study did not examine those systems.

City of Vancouver, Canada

In 2000, the City of Vancouver completed a study of the expected operational performance of the Regional Water Distribution System. In the event of a Design Basis Earthquake, a 475-year event, the report concluded the following (JELC Working Committee, 2000):

1. The present system will be severely impacted. Chlorine facilities evaluated have life safety concerns. Fiberglass tanks containing sodium hypochlorite and ammonia may overturn due to lack of anchorage.

2. An estimated 30 pipeline failures will occur, making much of the system inoperable.

3. All pump stations that were evaluated will likely be inoperable as a result of nonstructural and, in some cases, structural damage. All but two pump stations are dependent on commercial power. If power is out, pump stations without self-contained power will be inoperable.

4. All reservoir roofs/column supports are vulnerable. Some may collapse. In general, tanks should remain operable.

A later discussion of the development of an alternate water supply for Vancouver proposed development of procedures to allow use of two existing irrigation wells for potable supply should the city's supplies from reservoirs fail in an earthquake. In addition, a dedicated fire protection system, possibly supplied with sea water, was proposed (City of Vancouver).

San Fernando, California, Magnitude 6.7 Earthquake of 1971

Immediately following the earthquake, approximately 100,000 customers were without water, and a citywide "boil water" advisory was issued. Within 5 days, water service was restored to all but a few thousand customers; after 10 days, less than 100 scattered customers were without water. All "boil water" orders were lifted after 12 days (Housing and Urban Development, 2001).

Two dams, Van Norman and Pacoima were seriously damaged by this earthquake. Van Norman was replaced and Pacoima was repaired.

Kobe, Japan, Magnitude 6.8 Earthquake of January 17, 1995

An estimated 2,000 water pipeline failures occurred, draining reservoirs and limiting water available for fire suppression. Transmission and distribution pipeline and water purification plant damage resulted in 300,000 people still without water one month following the earthquake.

An aggressive earthquake mitigation program had replaced most of the city's cast iron pipe prior to the earthquake. Without that, program failures and restoration time could have been far greater. About 6 percent of Kobe's ductile iron pipe had a special seismic joint that appears to have had little or no damage. An earthquake monitoring and control system isolated 18 reservoirs saving the water for drinking in the days following the event.

The earthquake monitoring and control system consists of an earthquake ground motion monitoring center, telemetry, and reservoirs with earthquake isolation valves at 21 locations. There are dual reservoirs at each of the 21 sites; one has an isolation valve to be controlled following an earthquake, and one does not. This concept allows shutdown of one reservoir while maintaining service should the second reservoir inadvertently shut down. If the system can keep up with system leakage, the isolated reservoir can be put back on line from the control center. If the system cannot keep up with demand, the reservoir remains isolated (Ballantyne, 1995).

There were two major issues identified that had delayed system restoration:

- No water pressure was available to check the repairs while the tunnels remained out of service.
- Access – limited by collapsed buildings and traffic congestion.

California Division of Mines and Geology Planning Scenarios

The California Division of Mines and Geology has prepared two special publications intended to provide an understanding of the impacts of major earthquakes in southern California. The first was a Magnitude 8.3 Earthquake on the San Andreas Fault (California, 1982). The second was a magnitude 7 earthquake on the San Bernardino Valley segment of the San Jacinto Fault (California, 1993). Both studies anticipate significant damage to the State Water Project. That information is discussed in a later section of this report that focuses on the State Water Project. Impacts to other water facilities in the SBVWMD service area are discussed here.

The San Andreas publication hypothesized an earthquake in which the southern limit of surface fault rupture is outside of the San Bernardino service area (approximately 10 miles northwest of Devil Canyon Power Plant). Thus, it does not directly address facilities within the San Bernardino service area. Within the area that is affected (generally west and north of San Bernardino), it does not anticipate widespread damage to primary transmission lines, although some pipe failures will occur. In distribution lines, there will be hundreds of breaks and thousands of leaks. Pumping plants are generally more compact structures and, with the exception of related electrical equipment and transformers, will probably not suffer as great of damage as distribution pipelines.

The San Jacinto publication hypothesized an earthquake within Valley District's service area and thus, substantially more impact on SBVWMD. The publication's planning scenario states that within 25 miles of the fault, damage to treatment facilities, pumping stations, and transmission and distribution pipelines will reduce service by 20 percent for up to five days. Restoration will take up to two weeks. People will be asked to use emergency supplies, boil their water, or take other safety measures against contamination. Delays will be necessary because waste water lines must be repaired before fresh water lines. The most serious

problems will be concentrated in the low lying areas of San Bernardino and the Santa Ana River Basin. The extent of damage and contamination of wells and groundwater will depend on groundwater levels at the time of the earthquake.

Specific failures hypothesized by the San Jacinto publication to facilities that convey SBVWMD water include (State Water Project facilities are discussed in a later section):

- San Gabriel Valley MWD's pipeline closed for 5 to 10 days. Fault displacement.
- Valley District's Foothill Pipeline closed for 4 to 6 days. Moderate liquefaction potential.
- Valley District's Baseline Feeder closed for 4 to 6 days.

The main source for this hypothesis was the then General Manager of SBVWMD, Louis Fletcher.

Regional Electrical System Vulnerability

During this evaluation, no recent information was available from Southern California Edison on the anticipated likelihood of a widespread failure of the electrical system serving the San Bernardino Area. Nor was information found on the times required to restore power after the Loma Prieta Earthquake. In the absence of that data, we reviewed the impacts of the Northridge earthquake.

The total generating capacity supplying the greater Los Angeles area at the time of the Magnitude 6.8 Northridge Earthquake of January 17, 1994, was approximately 10,000 MW. When the earthquake occurred at 4:30 AM the southern California area was exporting approximately 1800 MW to the Northwest over AC and DC interties that link Southern California to Oregon and Washington State. As a result of the earthquake, the AC and DC interties were opened and the power grid in the United States west of Denver was spilt into three separate islands. Due to the loss of power, there were short-term outages, up to three hours, in British Columbia, Montana, Wyoming, Idaho, Oregon, and Washington.

Within the City of Los Angeles, restoration times of power at major substations varied from 6:18 AM to 11:03 PM on the day of the earthquake. Due to distribution system failures, power remained out for a longer period for some customers. But, within 24 hours power was restored to over 90 percent of its customers. Had the earthquake occurred during the summer when loads are heavier, restoration would have taken longer.

F: Objectives Workshop Feedback Matrix

IRUWMP Workshop #4 (February 2021)

The following tables list the feedback obtained regarding measuring success in meeting goals during a ConceptBoard exercise, and how the information was incorporated into the IRUWMP.

Goal #1: Improve Water Supply Reliability

How will we know we've achieved this goal?	How do we measure success?	How was this item captured in the IRUWMP?
Increased GW basin recharge	Completion of GW basin storage projects	Captured under Objective 1c.
	Continue to develop SW capture basins throughout the San Bernardino Basin	Captured under Strategies – "Increase Stormwater Capture", and notes that this strategy supports Goals 1, 2, 3 and 5.
	GW model will help answer the question of the deficit in each basin. Then look at supplies to determine reasonable recharge targets. Use Usable Storage Study to inform decisions	Captured under Objective 1c. The 10,000 AFY metric is within the available storage amount for local basins. The limitation is assumed to be water available for recharge, not storage capacity. Also included mention of the integrated model under needs discussion.
	Regular updates to model for each basin	Captured as part of groundwater management strategies.
	Better utilize in-lieu recharge via SWP/RW	Captured as a part of Objective 1b.
	Replenish Big Bear - in-lieu recharge ~200 AFY/ reduce in-lieu deliveries of SWP to BVMWC	Captured as a part of Objective 1c (separate numerical objectives not available for all basins, so one numerical objective used for all basins)
Increased local supplies	Annual Change in Groundwater Storage Report can track and measure success.	Incorporated into metrics for Objective 1c
	Additional local storage to capture and or import supplies	Captured as a part of Objective 1c
	Additional recharge locations/options to benefit all groundwater producers in the Basins. (new recharge basins or Injection wells??)	Captured as part of Objective 1c and as part of strategies
	Increased use of RW (SNRC, Clean Water Factory, Replenish Big Bear) - quantifiable	Captured as a part of Objective 1b.

	Make sure we have enough wells to extract the available gw supply (declining gw levels, Usable Storage Study could inform quantifying this)	Captured as a part of Objective 1b.
Maintained access to clean drinking water for all	Community surveys: Do residents believe they have access to clean water?	Included under the needs discussion related to water quality
	Low numbers of boil water/ do not drink orders?	Captured as part of Objective 3a
Improved resiliency to supply interruptions	Water Infrastructure specs. inventory (awareness of the condition of different portions of our delivery system allows us to plan for potential failures)	Captured under the needs discussion of Chapter 6 under "Disaster Preparedness"
	Continue to import as much SWP water as available	Captured as a part of Objective 1c
	Create additional interties, mutual aid agreements, etc..	Captured under Objective 1d.
	4 interties planned - keep this as a metric	Captured under Objective 1d. Numerical objective not used for this objective as the objective was expanded to include all strategies for improving system resiliency and ability to respond to emergencies.
	More emergency storage to supply water during power outages (BBLDWP Wolf Reservoir project)	Captured under Objective 1d
Robust emergency response approach	Increased participation in regional emergency groups (ex: ERNIE) alongside operations staff	Captured under Objective 1d
	Revitalize ERNIE group so everyone is aware of the regional resources available/try to get full participation of all Integrated Plan stakeholders	Added "developing agreements for mutual aid" to Objective 1d. ERNIE added to the objective narrative.
	Evaluate how a seismic event may impact groundwater wells, especially older wells	This information is captured by the seismic risk assessments conducted by each agency as part of meeting urban Water Management Plan requirements.
	Risk assessment and mitigation plan/prioritized actions	This information is captured by the seismic risk assessments conducted by each agency as part of meeting urban Water Management Plan requirements.

	Power outage vulnerabilities (PSPS and other) - what are the best options available to mitigate? Battery backups being considered	Captured under Objective 1d.
	Emergency response plans and mutual aid agreements that address pressing disasters as well as after action summaries	Captured under Objective 1d
	Exercises between agencies around communication and disaster response - once a year meeting/forum	Captured under Objective 1d
	could survey stakeholders to see who is involved/where needs are	Captured as part of the disaster preparedness needs narrative that notes a more detailed analysis is needed to determine impacts.
Comply with conservation legislative requirements	All agencies comply with Urban Water Use Objective (2024)	Captured under Objective 1a.
	Agencies continue to meet and report their achievements. Seek input on any hurdles.	Captured as part of plan for annual reporting of progress towards meeting goals and objectives.

Goal #2: Balance Flood Management and Increase Stormwater Recharge

How will we know we've achieved this goal?	How do we measure success?	How was this item captured in the IRUWMP?
Urban stormwater capture to increase recharge and improve surface water quality	Balance capacity required for flood control with available capacity to retain storm water.	Captured under Objective 2a.
	Number and acre feet of projects	Captured under Objective 2b.
	Sample WQ at sites before and after project installation	This type of monitoring would be expected to be included as part of pre- and post- project monitoring of stormwater capture projects.
	Requires coordination among agencies	Coordination among agencies is encouraged across all projects. Project partners is a scoring criteria for project prioritization.
	Consider potential water quality impairments that might impact GW	Captured under the groundwater management needs discussion.

Multi-benefit flood projects	Number of new project permitted and acre feet of projected recharge	Captured under Objective 2b.
	Number and type of alternate benefits, water quality, habitat, recharge, recreation	Captured under Objective 2b.
Flood control projects in DAC areas	Identify areas in most need and track project completion, # ppl impacted, flood risk reduction etc.	Captured under needs discussion and Objective 2c.
Joint use of flood control basins for recharge	Number and capacity of planned and implemented projects which benefit both flood management and water supply.	Captured under Objectives 2a and 2b.
	Number of Planning MOU's for new joint use projects	Captured under Objective 2a.

Goal #2: Balance Flood Management and Increase Stormwater Recharge

How will we know we've achieved this goal?	How do we measure success?	How was this item captured in the IRUWMP?
Urban stormwater capture to increase recharge and improve surface water quality	Balance capacity required for flood control with available capacity to retain storm water.	Captured under Objective 2a.
	Number and acre feet of projects	Captured under Objective 2b.
	Sample WQ at sites before and after project installation	This type of monitoring would be expected to be included as part of pre- and post- project monitoring of stormwater capture projects.
	Requires coordination among agencies	Coordination among agencies is encouraged across all projects. Project partners is a scoring criteria for project prioritization.
	Consider potential water quality impairments that might impact GW	Captured under the groundwater management needs discussion.
Multi-benefit flood projects	Number of new project permitted and acre feet of projected recharge	Captured under Objective 2b.
	Number and type of alternate benefits, water quality, habitat, recharge, recreation	Captured under Objective 2b.

Flood control projects in DAC areas	Identify areas in most need and track project completion, # ppl impacted, flood risk reduction etc.	Captured under needs discussion and Objective 2c.
Joint use of flood control basins for recharge	Number and capacity of planned and implemented projects which benefit both flood management and water supply.	Captured under Objectives 2a and 2b.
	Number of Planning MOU's for new joint use projects	Captured under Objective 2a.

Goal #3: Improve Water Quality

How will we know we've achieved this goal?	How do we measure success?	How was this item captured in the IRUWMP?
No violations of drinking water standards	Continue to work with DDW on current and upcoming PHG's, and MCL's. The objective would be there are no MCL violations for our region over the next five years	Captured under objective 3a
	Formulate a regional response to DDW, SWRCB and OEHHA to the upcoming PFAS/PFOA and other CEC's PHG and MCL's.	The need to address PFAS is noted under the water quality needs discussion.
Additional groundwater treatment to improve quality	WVWD has treatment on 4 wells alone - the Valley has a phenomenal amount of groundwater treatment. Next step - quantify capacity of all groundwater treatment and determine what percentage of total water supply comes from treated groundwater to set an objective for how much additional treatment to add in next 5 years.	Captured under Objective 3b
	Track pounds of contaminants removed from wellhead treatment facilities	Captured under Objective 3b
	Review periodic reports that indicate a reduction of contaminants over time.	Captured under Objective 3b
	Report the amount of Pounds of a constituent is removed during the treatment processess (e.g., 500 pounds of TCE removed during treatment (insert other constituents removed)	Captured under Objective 3b

Coordinated strategy to manage TDS and nitrogen in groundwater	Improving the quality of water in Big Bear Lake through Replenish Big Bear. Improves quality of groundwater and supports habitat downstream of Seven Oaks Dam	Project can be included in the recycled water supplies discussion. This is a great example of a multi-benefit project that uses highly treated recycled water.
	Continue to develop the Salt and Nutrient Management Plan for the Upper Santa Ana River Watershed Groundwater basins with the SAR Integrated Model	Captured under Objective 3c
	Review and follow recommendations in TDS/Nitrogen Mgmt Plans	Captured under Objective 3c

Goal #4: Improve Habitat and Open Space

How will we know we've achieved this goal?	How do we measure success?	How was this item captured in the IRUWMP?
Implement multi-benefit projects that increase recreation, public access and education opportunities	Propose a planning element during new project siting, which evaluates if the proposed project site's region is presently underserved in terms of recreation and open space.	Captured by the strategy "Incorporate Opportunities to Improve Habitat and Increase Recreation and Public Access During the Facilities Design Process"
	Seek new grant funding in bonds or local programs for including recreation or public access in flood/water supply projects	Pursuing funding is included as a part of the plan implementation chapter.
	Bring in representatives from different levels of the community to ensure benefits for all.	Captured by the strategy "Incorporate Opportunities to Improve Habitat and Increase Recreation and Public Access During the Facilities Design Process"
	Have multi-year plan in place across agencies and have action plan for grant funding to help secure federal funding	Pursuing funding is included as a part of the plan implementation chapter.
Preserved and improved habitat	Implementation of the HCP - what is currently being done. HCP has identified projects that have been required to meet permits. This would show baseline and projects that have been implemented.	Project acres identified in the HCP incorporated into Objective 4a.
	Track additional projects currently not included in HCP that would help meet requirements (ex: project in Rialto).	Project tracking for the IRUWMP is not limited to HCP projects.

	Do not duplicate efforts. Monitor implementation of the HCP through this integrated plan.	Tracking of progress in meeting objectives is captured under the Implementation chapter.
	Track number of acres/sq ft of public access/recreational spaces or linear feet of walkways/trails etc tied to our projects	Captured under Objectives 4a and 4b.
	Serve as a resource to other agencies projects to advise them on how to preserve water quality, improve stormwater runoff in their own projects (preservation of native plants etc)	Falls under the strategy of "Increase Outreach and Engagement"
Coordinate with San Bernardino County and the Cities on General Plans for Open Space and the RCIP	Number of new acres of open space or habitat preserves under endowed management	Captured under Objective 4a.
	Request members provide an update on if they have served on a committee, attended workshops or otherwise participated in County Plans	This will be a part of the annual report card development process.

Goal #5: Address Climate Change through Adaptation and Mitigation

How will we know we've achieved this goal?	How do we measure success?	How was this item captured in the IRUWMP?
Adapt to climate change impacts to water resources	Diverse, robust portfolio of imported and local supplies to be resilient to climate change impacts	Captured under Objectives 1b and 5a.
	Increased production and use of recylced water - producing a valuable resource with nominal increase in energy demand.	Captured under Objectives 1b and 5a.
	Manage changes in water supply variability, both local and imported. Success Measure: Long-term reliability of supply - ability to maintain level of service even with reductions in imported and local supplies	Captured under Objectives 1b, 1c and 5a.

	Quantify the number and size of multi-benefit flood/recharge projects. Water supply adaptation, and flood protection adaptation	Captured under Objectives 2b and 2d.
Reduce/offset energy consumption and GHG emissions associated with water facilities	If agencies meet urban water use objectives to prove effective demand management. Both a water supply and energy issue (both adaptation and mitigation)	Captured under Objective 1a
	Measurable reduction in energy intensity of water supplies (e.g. KWh/AF)	Captured under Objective 5b
	Helpful to measure changes in demand over time, both average and seasonal	Captured under Objective 1a
	X MW of renewable energy generation capacity installed X MWh of energy storage installed	Captured under Objective 1b
	Energy management in water distribution and wastewater collection systems. (e.g. storing water for use in high electricity demand periods, pumping off-peak)	Captured under Objective 1b
Meeting state level climate change objectives, as well as objectives from local Climate Action Plans. **Successful implementation of local and regional projects for adaptation / mitigation** **Continue to improve local, regional and statewide**	Threat of wildfire and flooding impacts on water quality. - Protection of supplies -Emergency aid agreements -Ability to bounce back, evaluate performance, share resources Success Measure: Number of partnerships / mutual aid agreements Looking back on results of disasters - were we able to avoid severe impacts and/or recover quickly? Reduced impact of event	Captured under Objective 1a

understanding of climate change impacts	Implementation of microgrids (local generation, storage and use of electricity) where feasible and appropriate to improve reslience to potential impacts to the regional electricity grid due to climate change. When electricity system is experiencing peak demand, so is water system.	Captured under Objective 5b.
	Increased public awareness of climate change and its impacts	Falls under the strategy of "Increase Outreach and Engagement"
	YVWD working on energy project at WWTP. (Jennifer to provide more info)	Specific projects to be included under Projects chapter.
	Key question - how can we measure regional impacts of a local program?	Captured under the Implementation chapter that discusses progress tracking.

G: Project List

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
IMPROVE WATER SUPPLY RELIABILITY	**IMPROVE WATER SUPPLY RELIABILITY**					
	Active Recharge City Creek Tributary Project	San Bernardino Valley Water Conservation District	$32,823,285	Daniel Cozad	dcozad@sbvwcd.org	City Creek East of the 210 Freeway
	Active Recharge in the Santa Ana River Tributaries [East]	San Bernardino Valley Water Conservation District	$88,000,000			
	Active Recharge in the Santa Ana River Tributaries [West]	San Bernardino Valley Municipal Water District	$127,000,000	Bob Tincher	bobt@sbvmwd.com	
	Active Recharge Mill Creek Tributary Project	San Bernardino Valley Water Conservation District	$2,595,052	Daniel Cozad	dcozad@sbvwcd.org	Mill Creek at SBVWCD Diversion
	Active Recharge Transfer Project [East]	San Bernardino Valley Conservation District	$88,000,000	Erwin Forgerson	Eforgerson@sbvwcd.org	
	Active Recharge Twin Creek Tributary Project	San Bernardino Valley Water Conservation District	$16,667,990	Daniel Cozad	dcozad@sbvwcd.org	Twin Creek Spreading Grounds
	Active Recharge Waterman Creek Tributary Project	San Bernardino Valley Water Conservation District	$23,709,212	Daniel Cozad	dcozad@sbvwcd.org	Waterman Spreading Grounds
	Active Recharge Plunge Creek Tributary Project	San Bernardino Valley Water Conservation District	$10,207,218	Daniel Cozad	dcozad@sbvwcd.org	Plunge Creek West of Orange Street
	Bunker Hill Conjunctive Use Project	San Bernardino Vally Municipal Water District	$14,200,000	Bob Tincher	bobt@sbvmwd.com	
	Cactus Basin Recharge Pipeline	San Bernardino Valley Municipal Water District	$2,500,000	Bob Tincher	bobt@sbvmwd.com	
	Calimesa Aquifer Storage and Recovery	Yucaipa Valley Water District	$6,250,000	Matthew Porras	mporras@yvwd.us	City of Calimesa, 33°58'24"N, 117° 2'54.29"W
	Calimesa Recycled Water Conveyance Project	Yucaipa Valley Water District	$5,500,000	Matthew Porras	mporras@yvwd.us	This project is a linear pipeline mainly located in Calimesa Blvd. 33°58'57.03"N, 117°3'5.16"W
	Central Feeder and EBX Intertie Project	San Bernardino Valley Municipal Water District	$2,000,000	Wen Huang	wenh@sbvmwd.com	
	City of Beaumont WWTP	City of Beaumont		Amer Jakher	ajakher@ci.beaumont.ca.us	

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
IMPROVE WATER SUPPLY RELIABILITY	City of Redlands WWTP	City of Redlands		Kevin Watson	kwatson@cityofredlands.org	1950 Nevada Street, Redlands
	City of San Bernardino Tertiary Treatment System (Formerly known as City of San Bernardino	San Bernardino Municipal Water Department	$8,730,000			
	Devil Canyon Recharge Project	San Bernardino Valley Municipal Water District	$10,000,000	Bob Tincher	bobt@sbvmwd.com	
	Enhanced Recharge in Santa Ana River Basins Phase 1B	San Bernardino Valley Municipal Water District	$55,000,000	Bob Tincher	bobt@sbvmwd.com	
	Enhanced Recharge in Santa Ana River Basins Intake Improvement	San Bernardino Valley Municipal Water District	$3,000,000	Bob Tincher	bobt@sbvmwd.com	
	Enhanced Recharge in Santa Ana River Basins Phase 1C	San Bernardino Valley Municipal Water District	$3,000,000	Bob Tincher	bobt@sbvmwd.com	
	Erwin Lake Fire Flow	Big Bear Lake Department of Water and Power		Reggie Lamson	rlamson@bbldwp.com	
	Foothill Pipeline Infrastructure Improvements	San Bernardino Valley Municipal Water District	$10,000,000	Bob Tincher	bobt@sbvmwd.com	
	Foothill Pipeline Interior Relining	San Bernardino Valley Municipal Water District	$10,000,000	Bob Tincher	bobt@sbvmwd.com	
	Groundwater Reclamation Interagency Project (GRIP)	City of Redlands	$9,100,000	Kevin Watson	kwatson@cityofredlands.org	
	Henry N. Wochholz WWTP (Salinity and Groundwater Enhancement Project)	Yucaipa Valley Water District	$27,700,000	Kathryn Hallbergy	khallberg@yvwd.us	880 W. County Line Rd, Yucaipa CA, 92399
	IEUA Regional Treatment Plant 4	Inland Empire Utilities Agency		Elizabeth Hurst	ehurst@ieua.orh	
	Medical Center No. 2 Reservoir	San Bernardino Municipal Water Department	$18,100,000	Miguel Guerrero	miguel.guerrero@sbmwd.org	X = 6767194.45 feet; Y = 1874365.95 feet (NAD 83, State Plane, Zone 5, CA, Feet)
	Recharge in Cactus Basin		$5,000,000			
	Recycled Water System Expansion	City of Redlands	$4,858,700	Kevin Watson	kwatson@cityofredlands.org	1950 Nevada Street, Redlands

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
IMPROVE WATER SUPPLY RELIABILITY	Regional Recycled Water Recharge Pipeline	San Bernardino Valley Municipal Water District	$25,000,000	Bob Tincher	bobt@sbvmwd.com	
	Replenish Big Bear (formerly Big Bear Valley Water Sustainability Project)	Big Bear Area Regional Wastewater Agency	$61,152,000	David Lawrence	dlawrence@bbarwa.org	BBARWA Wastewater Treatment Plant 121 Palomino Drive, Big Bear
	Reservoir Seismic Upgrades	City of San Bernardino Municipal Water Department	$27,800,000	Steve Miller	Steve.Miller@sbmwd.org	Thirteen (13) reservoir sites spanning the City of San Bernardino.
	Riverside North Aquifer Storage & Recovery Project	San Bernardino Valley Municipal Water District	$45,000,000	Bob Tincher	bobt@sbvmwd.com	
	Riverside-Corona Feeder	Western Municipal Water District	$176,000,000			
	Seven Oaks Dam Borrow Pit Groundwater Recharge and Habitat Restoration Project	San Bernardino Valley Water Conservation District	$7,700,000	Daniel Cozad	dcozad@sbvwcd.org	Lattitude: 34° 5'58.32"N Longitude: 117° 7'12.28"W
	Calimesa Recharge Basin	South Mesa Water Company	$5,872,190	Dave Armstrong	darmstrong@southmesawater.com	
	Stormwater Capture and Recharge	City of Riverside Public Utilities	$3,000,000	Leo Ferrando	Lferrando@riversideca.gov	33.98346 , -117.34607
	Twin Creek Channel and Spreading Grounds	San Bernardino Valley Municipal Water District		Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.1657 Long.-117.2674
	Weaver Basins	San Bernardino Valley Municipal Water District	$6,000,000	Wen Huang	wenh@sbvmwd.com	Recycled Water Recharge from SNRC & CWF
IMPROVE WATER QUALITY	**IMPROVE WATER QUALITY**					
	Big Bear Lake Management Plan	Multiple Agencies	$260,000			
	Cable Creek Basin (Upper)	County of San Bernardino Flood Control District	$20,000,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.1961 Long. -117.3635
	City of Beaumont Desalter	City of Beaumont		Amer Jakher	ajakher@ci.beaumont.ca.us	
	Desalter and Brine Disposal (Salinity Concentration Reduction and Minimization - (YVRWFF)	Yucaipa Valley Water District	$7,913,000	Kathryn Hallberg	khallberg@yvwd.us	35477 Oak Glen Rd., Yucaipa CA, 92399

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
IMPROVE WATER QUALITY	Little Sand Creek - Concept 1 &2 - City of San Bernardino	County of San Bernardino Flood Control District	$6,825,600 concept 1; $3,216,957 concept 2	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.1446 Long. -117.2474
	RIX Facility Basin Levee Project	San Bernardino Municipal Water Department	$3,300,000	Kevin Stewart	kevin.stewart@sbmwd.org	RIX Location
	Sari Improvement Project					
	Security Fencing of Groundwater Recharge Facilities	San Bernardino Valley Water Conservation District	$1,640,000	Daniel Cozad	dcozad@sbvwcd.org	Lattitude: 34° 5'57.38"N Longitude: 117° 7'51.11"W
BALANCE FLOOD MANAGEMENT AND INCREASE STORMWATER RECHARGE	**BALANCE FLOOD MANAGEMENT AND INCREASE STORMWATER RECHARGE**					
	Alluvial Fan Development Guideline	Water Resources Institute - California State University San Bernadino		Janiene Friend	Janiene.Friend@water.ca.gov	
	Cactus Basins #3	San Bernardino County Parks Department	$21,300,000	Ken Eke	keke@dpw.sbcounty.gov	N34 07' 28", W117 23' 19"
	Cactus Basins #4 and #5	San Bernardino County Parks Department	$21,300,000	Ken Eke	keke@dpw.sbcounty.gov	N34 07' 51", W117 23' 27"
	Carbon Canyon Creek Channel	SBCFCD	$19,500,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 33.9877 Long. -17.7239
	City Creek Levee Repair - Highland	County of San Bernardino Flood Control District	TBD	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.1277 Long. -117.1908
	Del Rosa Feasibility Study	County of San Bernardino Flood Control District	$7,878,455 (concept 1) $2,930,297 (concept 2) $1,500,000 (Feasibility	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0941 Long. -117.2581
	Elder Creek Channel -Highland	County of San Bernardino Flood Control District	$14,700,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.1082 Long. -117.1725
	Grove Basin Outlet Storm Drain	City of Ontario and SBFCD	$9,300,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0120 Long. -117.6180
	Hawker Crawford Channel	City of Fontana and SBFCD	$8,900,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.1503 Long. -117.4870
	Mission Channel Feasibility Study	County of San Bernardino Flood Control District	$1,500,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0741 Long -117.2704

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
BALANCE FLOOD MANAGEMENT AND INCREASE STORMWATER RECHARGE	Mission Channel-Santa Ana River to Tennessee Street	County of San Bernardino Flood Control District	$8,190,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0655 Long. -117.2335
	Randall Basin	San Bernardino County Parks Department	$1,460,000	Ken Eke	keke@dpw.sbcounty.gov	N34 05' 09", W117 21' 09"
	Rialto Channel Willow Ave. To Etiwanda Ave. Rialto	County of San Bernardino Flood Control District	$40,200,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0769 Long. -117.3779
	San Antonio Storm Drain	City of Ontario	$23,300,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0213 Long. -117.6588
	San Timoteo Creek Basin Slope Repair-Redlands	County of San Bernardino Flood Control District	$410,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat 34.0265 Long. -117.2008
	Sand/Warm Confluence	San Bernardino County Parks Department		Ken Eke	keke@dpw.sbcounty.gov	N34 07' 05", W117 15' 29"
	West Fontana Channel Hickory to Banana Basin	County of San Bernardino Flood Control District	$11,500,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0941 Long. -117.4924
	West State Street Storm Drain- Montclair	County of San Bernardino Flood Control District	$23,600,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0603 Long. -117.6809
	Wildwood Channel- Interstate 10 to Holmes St. - Yucaipa	County of San Bernardino Flood Control District	$16,670,920	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0137 Long. -117.0635
	Wilson Creek -10th Street to Interstate 10 - Yucaipa	County of San Bernardino Flood Control District	$11,000,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.0250 Long. -117.0790
	Wilson III Basin Project	City of Yucaipa	$8,900,000	Michael R. Seal	mseal@yucaipa.org	The project is proposed to be located within an approximate 100 acre site at the confluence
IMPROVE HABITAT AND OPEN SPACE	**IMPROVE HABITAT AND OPEN SPACE**					
	Combined SBKR and Water Recharge Enhancement - Wash Plan Implementation	San Bernardino Valley Water Conservation District	$1,371,101	Daniel Cozad	dcozad@sbvwcd.org	Lattitude: 34° 6'12.20"N Longitude: 117° 9'27.62"W
	Hidden Valley Duck Ponds Mitigation Project	San Bernardino Valley Municipal Water District	$2,000,000			
	Lake Rialto	City of Rialto	$6,000,000	Thomas Crowley	tjcrowley@rialotca.gov	Area directly south of the City of Rialto Wastewater Treatment Plant, 501 E. Santa Ana Ave,

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
IMPROVE HABITAT AND OPEN SPACE	LIDS for Kids- Low Impact Development	Inland Empire Resource Conservancy District	$237,000	Brian/Mandy	ey@iercd.orgmparkes@iercd.org	
	Lytle Creek Watershed Assessment and Restoration	Water Resources Institute - California State University San Bernadino	$260,000	Janiene Friend	Janiene.Friend@water.ca.gov	
	Pedley Landfill Removal and Native Habitat Restoration Mitigation Project	San Bernardino Valley Municipal Water District	$5,000,000			
	Plunge Creek Stream Bed Restoration - Highland	County of San Bernardino Flood Control District	$7,480,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat. 34.1147 Long. -117.1399
	Removal of Invasive Plant	Inland Empire Resource Conservancy District	$300,000	Brian/Mandy	brobey@iercd.org; mparkes@iercd.org	
	Rialto Channel Mitigation for Santa Ana Sucker	San Bernardino Valley Municipal Water District	$4,000,000	Wen Huang	wenh@sbvmwd.com	
	Rubidoux Nature Center, Evans and Sunnyslope Creeks - Habitat, Rehabilitation, and Enhancement Mitigation Project	San Bernardino Valley Municipal Water District	$3,000,000			
	San Timoteo Basin Mitigation Project-Redlands	County of San Bernardino Flood Control District	$500,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat 34.0303 Long. -117.2047
	San Timoteo Canyon State Park Habitat Conservation	R.L.C.	$5,500,000	Jack Easton	jeaston@riversandlands.org	The study area is about 10,000 acres generally centered on coordinates Lat. 33.976550° /
	Santa Ana River Habitat, Parks, and Water Project	City of Riverside Public Utilities/ San Bernardino Valley Municipal Water District	$40,000,000	Greg Herzog, Chris Jones	@riversideca.gov, chrisj@sbvmwd.com	
	SAR Trail - Phase III	San Bernardino County Parks Department		Ellie Hargrove	ehargrove@dpw.sbcounty.gov	Waterman Ave to California St, San Bernardino to Redlands (along south side of river)
	SAR Trail - Phase IV	San Bernardino County Parks Department		Ellie Hargrove	ehargrove@dpw.sbcounty.gov	California St to Garnet St, (along south side of river) in San Bndo and Redlands
	Upper Santa Ana Watershed Alluvial Sage Scrub Habitat Restoration Mitigation Banking Construction Program	San Bernardino Valley Water Conservation District		Daniel Cozad	dcozad@sbvwcd.org	Lattitude: 34° 5'56.71"N Longitude: 117° 9'4.47"W
	Warm Creek – Baseline Street to Sand Creek Confluence – Concept 1	County of San Bernardino Flood Control District	$6,350,000	Michael Fam	mfam@dpw.sbcounty.gov	Lat 34.1213 Long. -117.2474
	Warm Creek – Del Rosa Confluence to Sand Creek Confluence – Concept 2	County of San Bernardino Flood Control District	$26,126,325	Michael Fam	mfam@dpw.sbcounty.gov	Lat 34.1161 Long. -117.2662

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
IMPROVE HABITAT AND OPEN SPACE	Warm Creek Restoration Project	Inland Empire Resource Conservancy District	$63,000	Brian/Mandy	brobey@iercd.org; mparkes@iercd.org	
	Wash Habitat Conservation Plan	San Bernardino Valley Water Conservation District	$800,000	Daniel Cozad	dcozad@sbvwcd.org	Lattitude: 34° 5'56.71"N Longitude: 117° 9'4.47"W
ADDRESS CLIMATE CHANGE THROUGH ADAPTATION AND MITIGATION	**ADDRESS CLIMATE CHANGE THROUGH ADAPTATION AND MITIGATION**					
	Energy Resiliency Project - HWRWRF	Yucaipa Valley Water District	$25,000,000	Matthew Porras	mporras@yvwd.us	880 County Line Road, Yucaipa Ca 92399
	Energy Resiliency Project - YVRWFF	Yucaipa Valley Water District	$20,000,000	Matthew Porras	mporras@yvwd.us	35477 Oak Glen Road, Yucaipa, CA 92399
	Hydroelectric Acquistion Projects	SBV Water User Consortium	TBD	Wen Huang	wenh@sbvmwd.com	
	Waterman Turnout Hydroelectric Plant	San Bernardino Valley Municipal Water District	$4,500,000	Bob Tincher	bobt@sbvmwd.com	
PROJECTS REMOVED FROM LIST	**PROJECTS REMOVED FROM LIST**					
	Beaumont Avenue Recharge Facility	San Gorgonio Pass Water Agency		Project Complete		
	Opal Recharge and Flood Control Basin	City of Redlands		Removed at the request of Project Sponsor		
	Downtown Storm Drain Project	City of Redlands		Removed at the request of Project Sponsor		
	RIX Flow Outage Mitigation for Santa Ana Sucker	San Bernardino Valley Municipal Water District		Removed at the request of Project Sponsor		
	Stanfield Marsh	No Agency Listed		No Agency Listed; Do Not Include		
	Bogart Park Wetlands	No Agency Listed		No Agency Listed; Do Not Include		
	BCV Forest Land Reserved	No Agency Listed		No Agency Listed; Do Not Include		
	I.E. Sustainable Watershed Project	No Agency Listed		No Agency Listed; Do Not Include		
	Central Feeder Pipeline	San Bernardino Valley Municipal Water District	$117,000,000	Bob Tincher	bobt@sbvmwd.com	
	West End Pump Station	San Bernardino Valley Municipal Water District	$10,000,000	Bob Tincher	bobt@sbvmwd.com	
	Yucaipa Connector	San Bernardino Valley Municipal Water District	$4,500,000	Bob Tincher	bobt@sbvmwd.com	
	Rialto-Colton Basin Groundwater Recharge Study	San Bernardino Valley Municipal Water District	$280,000	Bob Tincher	bobt@sbvmwd.com	
	Pellesier Ranch Recharge and Water Treatment Plant	City of Riverside Public Utilities	$17,700,000	Inactive Project, Agency Not Pursuing		
	Santa Ana River Construction Area	San Bernardino Valley Municipal Water District	$122,000,000	Bob Tincher	bobt@sbvmwd.com	

Primary Goal	Project	Project Sponsor	Project Costs and Funding	Contact Name	Contact Email	Project Location
PROJECTS REMOVED FROM LIST	Installation of Groundwater Monitoring Wells in Santa Ana River Forebay	San Bernardino Valley Water Conservation District	$640,000	Daniel Cozad	dcozad@sbvwcd.org	
	Bunker Hill Basin Water Supply Reliability	West Valley Water District	$13,000,000	Inactive Project, Agency Not Pursuing		

H: Blank Project Submittal Form

Upper Santa Ana River Watershed
2020 Integrated Regional Urban Water Management Plan

Call for Projects – Project Submittal Form

Please email all forms and supporting documents to Dawn Flores (dflores@woodardcurran.com) and Laine Carlson (lcarlson@wsc-inc.com)

Please check one. This form is to:

☐ Update an existing project in the 2015 IRWMP/current project list

If updating an existing project, only the information that has changed needs to be provided; other sections can be left blank

☐ Submit a new project to be included in the 2020 IRUWMP

Note: new projects can be submitted at any time and will be added to the list once approved.

1. Contact Information

General Information	
Project Name	
Lead Agency or Organization	
Organization Address	
Project Partners (if applicable)	
Contact Information	
Primary Contact Name	
Organization	
Title	
Phone Number	
Email	

2. Project Description

Project Information	
Readiness for implementation (conceptual or developed)	
Type (planning or implementation)	
Location (address, coordinates and/or other location description to describe the project area)	

Project Description

Provide a 1-2 paragraph project description. Include a discussion of any facilities that will be constructed or programs to be implemented, and how these will provide water resource-related benefits to the Region.

Relationship to other Projects in the Region

Can the project be integrated with other regional projects?

Has there been any coordination with other entities within or outside of the Region?

3. Project Benefits

Check the benefits the project will provide. All projects must provide one or more benefits. Project components that will ensure these benefits should be included in the Project Description.

Improve Water Supply Reliability
☐ Reduce demand for water
☐ Increase utilization of local supplies
☐ Increase storage of water in groundwater basins during wet years
☐ Improve system resiliency and the ability to respond to emergency supply interruptions
☐ Ensure equitable access to clean drinking water
Balance Flood Management and Increase Stormwater Recharge
☐ Utilize flood control retention/detention basins for recharge
☐ Reduce the risk of flooding while providing multiple benefits, where possible
☐ Improve flood control or reduce the risk of flooding in disadvantaged communities
☐ Improve surface water quality and increase recharge by capturing stormwater in urban areas
Improve Water Quality
☐ Reduce or eliminate violations of drinking water quality standards
☐ Improve surface and groundwater quality by treating water supply
☐ Manage total dissolved solids and nitrogen in groundwater
☐ Ensure equivalent water quality services for disadvantaged communities
Improve Habitat and Open Space
☐ Improve habitat and open space
☐ Increase recreation and public access in and around local waterways
Address Climate Change through Adaptation and Mitigation
☐ Adapt to the impacts of climate change on water resources
☐ Reduce or offset energy consumption or GHG emissions associated with water and wastewater systems

Additional Benefits

Check which Disadvantaged Communities (DAC), Native American Tribal Communities and Environmental Justice concerns are features of the project:

☐ Benefits to DACs. Explain:

☐ Benefits to Native American Tribal communities. Explain:

☐ Addresses Environmental Justice[1] concerns. Explain:

[1] Environmental Justice is defined by State Law as: “the fair treatment and meaningful involvement of all people regardless of race, color, sex national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.”

4. Project Schedule

Provide the current status of the project (e.g., initial study, planning, design, environmental review, in construction) and include a timeline for the project.

5. Project Costs and Funding

Project Costs

Provide the total estimated project cost.

Funding

List potential sources of funding for the project and percent of project that has been funded or financed, if available.

Basis for Project Cost

Describe the basis for the project cost, such as a feasibility study, partial design, etc. If a cost estimate has been prepared, please list that document here.

6. Supporting Information

Technical Feasibility

Provide the name of supporting documents that indicate/justify project feasibility.

Economic Feasibility

Has a cost-effectiveness or benefit-cost analysis been performed for the Project? Provide a copy of (or link to) the economic analysis, if available.

7. Other Considerations

Has the lead agency or organization adopted the latest Upper Santa Ana River Watershed 2015 Integrated Urban Water Management Plan and/or will the lead agency or organization adopt the 2020 Integrated Regional Urban Water Management Plan?

I: Water Management Strategies

Appendix I: Description of Water Management Strategies

The water management strategies identified in Part 1 Chapter 6 are described in detail in this Appendix.

Reduce Water Demand

Implement Urban Water Use Efficiency

Urban Water Use Efficiency (WUE) involves reducing potable water used for municipal, commercial, industrial, irrigation and aesthetic purposes, and is an important element in almost every water purveyor's water resource planning efforts. Such efficiency methods include incentives, public education, and other efficiency-enhancing programs. Significant progress has been made to reduce urban water use in the Region. This strategy will also mitigate against climate change by reducing the energy use and GHG emissions associated with conveying water over long distances and treating water for potable use. The Region plans to continue these programs and work on other strategies such as implementing water rate structures that reduce water waste.

This strategy aligns with the Region's objective to comply with conservation legislative requirements (AB 1668 and SB 606).

Implement Agricultural Water Use Efficiency

Agricultural WUE includes improvements in technology and management of water, both on-farm and at the water supplier level through incentives, public education, and other programs. Future agricultural WUE measures will focus on development of new technologies and further economic incentives.

Though implementation of this strategy will help the Region to achieve its goal of improving water supply reliability and adaptively managing climate change impacts, since agriculture is not a large industry in the Region, implementing agricultural WUE will provide limited benefit to the Region.

Increase Water Supply

Increase Recharge

Recharge projects increase local groundwater supplies, which can help the Region both mitigate and adapt to climate change. Groundwater use may be a critical resource during droughts, which are expected to intensify as a result of climate change. Local groundwater supplies can also mitigate climate change by offsetting GHGs associated with transporting imported water over long distances. Recharging surface water runoff also protects downstream surface water flows and key habitats that sequester carbon and reverse GHG pollution.

Flood control projects, such as new detention basins, can be used to increase recharge of local stormwater runoff in addition to reducing flood risk in the Region. These projects will have the

additional benefit of increasing groundwater storage to improve water supply reliability. Secondarily, these projects will improve water quality in surface waters by reducing stormwater runoff volumes.

Increase Surface Water and Groundwater Storage Inside and Outside the Region

This strategy will improve water supply reliability by increasing storage, increasing utilization of local supplies, and preparing for disasters that could cause an interruption in imported water or failure of regional water conveyance. Supplies stored in water banks and other reservoirs can be used as a buffer for drought periods, which are expected to become more frequent and longer as a result of climate change.

Optimize Wet Year Storage and Dry Year Pumping (Conjunctive Use & Groundwater Management)

Conjunctive use, storing water in wet years for later use during dry years, can help improve the Region's long-term and seasonal water supply reliability. This strategy also helps to maximize the utilization of California's "feast or famine" hydrology which is characterized by wet years and dry years with relatively few years in between. Implementation of this strategy supports the Region's objectives of increasing utilization of local supplies and increasing storage. This strategy also increases water supply reliability by helping meet the objective to prepare for disasters by implementing storage projects.

Conjunctive use can help improve the Region's long-term and seasonal water supply reliability. This strategy helps to maximize water storage in wet years for later use during dry years. This supply is essential in drought periods, which are projected to become more common and intense as a result of climate change. Implementation of this strategy supports the Region's objective of managing climate change impacts.

Increase Recycled Water Use

Water supply reliability in the Region can be improved by increasing the use of recycled water. Use of recycled water eliminates the need for an equivalent amount of potable water. Recycled water is also extremely reliable since wastewater flows continue independent of whether it is a wet period or a dry period.

Water recycling can also reduce energy consumption and associated GHG emissions by lowering dependence on imported water supplies. Although recycled water supplies can be affected by drought and increased conservation, the impacts are typically lower than other resources. This supply source is also considered more resilient to temperature and precipitation variation expected with climate change.

Increase Stormwater Capture

Water supply reliability in the Region can be increased by capturing local stormwater that historically flowed to the ocean. The Region is working on a variety of projects that would capture more of this local resource. This strategy will help increase storage and utilization of local supplies and increase local supply reliability. Implementation of this strategy will help

mitigate climate change by decreasing regional dependence on imported water and reducing GHG emissions associated with conveying imported water to the Region.

In addition, local stormwater is of very high quality. Therefore, capturing and recharging more local stormwater not only improves water supply reliability but also improves water quality. Capturing stormwater for groundwater recharge can apply to the Region's objective to manage TDS and nitrogen by diluting these constituents with water that is of higher quality than imported water.

Support Bay Delta Conveyance Project

The DCP is intended to improve habitat in the Delta while improving supply reliability for the SWP. The DCP will also result in improved water quality for the SWP, primarily in dry years when there is less fresh water to keep salt water from flowing into the Delta. The freshwater increases in salts as it passes through the Delta. The DCP will move the SWP intakes to the north and bypass the Delta, limiting the increase in salinity during dry years and thereby improving the quality of water delivered through the SWP to the Region and the rest of Southern California.

Operate Existing Facilities to Increase Recharge

Increasing recharge in existing facilities would maximize groundwater infiltration and storage in recharge areas. Local groundwater supplies are key for the Region as they can reduce the need to import water, effectively decreasing the amount of energy associated with water conveyance over large distances. Groundwater recharge also prevents water tables from dropping and then being pumped from lower depths with high energy costs. Local water supplies will also increase the Region's resiliency to droughts as imported water becomes increasingly vulnerable to climate change.

Modifications and/or adjustments to SBCFCD facilities may be needed to effectively integrate water recharge concepts. While the primary function of SBCFCD is 'flood control', water conservation is part of the SBCFCD mission. Cooperation between the SBCFCD and water agencies will allow for further adaptation of flood control facilities with the facilities of other local agencies for the preservation of local waters. All basins and SBCFCD storm water conveyance systems in Zones 2 and 3 have potential for utilization in groundwater recharge scenarios given the proper study, design concept, and configuration. In addition, avenues for future SBCFCD/local agency agreements can be identified to truly integrate mutual efforts for water conservation.

Implement System Reoperation

System reoperation allows for better management and movement of existing water supplies and includes managing surface storage facilities to optimize the availability and quality of stored water supplies. System reoperation could involve balancing supply and delivery forecasts, coordinating and interconnecting reservoir storage, and optimizing depth and timing of

withdrawals. This strategy will help the Region improve water supply reliability by helping to meet objectives such as increasing utilization of local supplies and increasing storage.

Improve Supply Conveyance – Delta

The Region relies on the SWP for imported water supplies. Improvements to the SWP system increase the reliability of this supply source. The Region recognizes the importance of the SWP and, therefore, desires to support the Delta Conveyance Project (DCP) which would restore reliability to the SWP while also improving habitat.

Improve Supply Conveyance – Regional/Local

Local and regional water supply conveyance in the Region can include both natural watercourses and man-made facilities such as pipelines and flood control channels. Infrastructure associated with these conveyance facilities includes pumping plants and diversion structures. The local/regional conveyance strategy seeks to improve existing conveyance systems by upgrading aging distribution systems, as well increasing system flexibility and reliability through the addition of interconnections among water resource systems. Establishing performance metrics for quantitative/qualitative indicators and assuring adequate resources to maintain the condition and capacity of existing conveyance facilities are also aspects of this strategy.

Conveyance infrastructure improvements and upgrades can improve the operational flexibility of delivery systems to better accommodate peak demands and emergency water needs, which will help the Region to meet its objective of preparing for disasters. Additional local and regional conveyance can also increase utilization of local supplies and continue to ensure equitable access to clean drinking water for all communities. This strategy will also help the Region mitigate climate change by reducing the energy use and GHG emissions associated with transporting water.

Identify Water Transfer Opportunities

Water transfers are temporary or long-term changes in the point of diversion, place of use, or purpose of use by contracting or moving water from one beneficial use to another. Through pipeline interties and other facilities, the Region can make a variety of water transfers and increase supply resiliency. These transfers would typically be used in times of shortage caused by drought or emergency, such as an earthquake. The Region will continue identifying additional interties that would increase the opportunity for future water transfers.

Improve Water Quality

Match Water Quality to Use

Matching water quality to use recognizes that not all water uses require the same quality of water. Agricultural, municipal, landscape and residential water uses have different water quality needs. Achieving water quality standards can also be impacted by natural background

conditions, natural flow conditions, irreversible human impacts, hydrologic modifications, natural features of the water body and economic hardships.

Matching water quality to water use by recognizing the different needs, natural background conditions, hydrologic limitations, and economics ensures that limited public resources can be focused on the most significant problems. Benefits of this strategy can include providing cost saving opportunities by reducing treated water costs if users can be supplied with raw water or recycled water, while reserving high quality water for drinking water purposes. This strategy can help the Region to achieve its goal to improve water quality.

Improve Drinking Water Treatment and Distribution

Public water systems must develop and maintain adequate water treatment and distribution facilities to meet the goal of providing a reliable supply of safe drinking water. The drinking water treatment and distribution strategy includes improving the quality of potable water supplied to customers and improving conveyance systems to improve the quality of supplies delivered from treatment facilities. Implementing this strategy will support the Region's objectives to ensure no violations of drinking water standards by improving water quality and the ability to access and increase groundwater supply that may not have been previously available due to quality concerns. Overall water quality is reported to customers in annual consumer confidence reports. The Region plans to use these reports as a strategy to ensure drinking water quality standards are met. Improving supply quality and distribution will also help achieve the Region's objective to continue to provide high quality drinking water to all communities.

Implement Pollution Prevention Measures

Pollution prevention controls or reduces pollutants from point and nonpoint sources that can affect multiple environmental resources, including water supply, water quality, and riparian and aquatic habitat. Strategies that prevent pollution can include public education, efforts to identify and control pollutant contributing activities, and regulation of pollution-causing activities. Pollution prevention includes implementation of water quality BMPs that reduce contaminant concentrations to reduce loading to 303(d) listed receiving waters and/or supply sources. BMPs can include either structural BMPs, where the BMP involves designing and building structural treatment and control facilities, or non-structural BMPs, where the BMP does not require construction of a physical component to filter stormwater.

Projects that remove contaminants using the soil as a filter have the secondary benefit of mitigating flood risk and increasing stormwater recharge, thereby increasing water supply reliability. Pollution prevention can improve water quality for all beneficial uses by protecting water at its source and therefore reducing the need and cost for other water management and treatment options. By preventing pollution throughout the watershed, water supplies can be used and reused for a broader number and types of downstream water uses. Protecting source water is consistent with a watershed management approach to water resources problems.

Manage Salt and Salinity

This strategy encourages stakeholders to proactively identify the sources of salinity, prioritize the necessary mitigation actions, and work collaboratively with entities that have the authority to take appropriate actions. Effective salt and salinity management will reduce the accumulation of salinity in drinking water supplies. This strategy can help the Region meet several objectives including improving surface and groundwater quality and managing TDS and nitrogen.

Manage Sediment

Sediment management decreases turbidity and suspended sediment concentrations in surface waters that provide drinking water supplies. Sediment management also improves the permeability of drainage areas by filtering water and reducing turbidity, suspended solids, nutrients, and concentrations of trace metals and organic contaminants present in the sediments before the water enters aquifers.

The sediment management strategy can also be used to preserve or improve habitat by conserving or restoring riparian, wetland, and permanent water areas. This strategy protects sediment as a valuable resource for the restoration and renewal of stream habitats, wetlands, riparian vegetation, and floodplains and prevents excessive amounts from degrading surface water quality.

Manage Urban Runoff

The Region plans to work with land use authorities to improve urban runoff management which includes strategies for managing or controlling urban runoff, such as intercepting, diverting, controlling, or capturing stormwater runoff or dry weather runoff. Urban runoff management strategies, coupled with centralized groundwater recharge or decentralized low impact development (LID) projects, can also help to improve groundwater recharge. Several BMPs can be used to manage urban runoff and prevent surface water quality contamination such as public education, bioswales, permeable pavers, vegetated buffers, rainwater harvesting, construction erosion control, and others. Reducing dry weather flows that are often caused by over-irrigation may also be improved through water conservation programs that aim to improve water use efficiency.

The urban runoff management strategy supports the Region’s objective to improve surface and groundwater quality and has the secondary benefits of reducing flood risk.

Remediate Groundwater Contamination Plumes

Groundwater management is currently influenced by the presence of contamination plumes. Avoiding any impacts to and from the plumes and removing the contaminants when possible is a Basin Management Objective for the Region and is also consistent with SGMA.

Flood Management

Manage Flood Risk

Integrated water management seeks a balance between exposure of people and property to flooding, the quality and functioning of ecosystems, the reliability of water supply and water quality, and economic stability that includes both economic and cultural considerations. Through the implementation of integrated flood management techniques, the Region intends to improve stormwater recharge and reduce runoff flows.

Practice Resources Stewardship

Continue Basin Management in Local Groundwater Basins

Local groundwater basins are a major source of supply for the Region. Projects that will implement this strategy should align with management structures already in place for each groundwater basin. For example, the BTAC monitors and manages the SBB. The Region is currently working to maximize the conjunctive use of the SBB. The BTAC also evaluates liquefaction potential on a monthly basis and has a dewatering plan should additional pumping be required to lower water levels and reduce liquefaction potential. As another example, the Yucaipa Subbasin has been designated as a high-priority basin under SGMA and is therefore required to have a Groundwater Sustainability Plan put into place to sustainably mange the Subbasin over the long-term planning and implementation horizon. The Rialto Basin has also just established a Groundwater Council that will be developing a groundwater management plan.

Included in the basin management strategy is the management of high groundwater potential in the SBB. The SBB is uniquely constrained by shallow groundwater levels when the basin is too full. The shallow groundwater conditions have been artesian in the past and occur in an area of South San Bernardino called the Pressure Zone, or Area of Historic High Groundwater. High groundwater levels increase the risk of liquefaction, flood basements and can impact underground utilities. These conditions can also limit opportunities for recharge and/or groundwater banking in the basin.

Develop Watershed Management Projects and Programs

Watershed management utilizes planning, programs, and projects to restore and enhance watershed functions. Watershed planning encompasses a broader perspective on water resources management, including improving and protecting water quality, ecosystems, and open space. Using the watershed as a basic management unit promotes multi-benefit, integrated projects and collaboration among policies and actions, often requiring the involvement of stakeholders. Given this, projects that use watershed management can help the Region to meet several of its objectives including improving surface and groundwater quality and managing TDS and nitrogen.

Development of watershed management projects and programs also promotes integrative planning that enhances ecosystem services. Typically, a diversified watershed ecological system is more robust and resilient to rapid climate changes. Maintaining a healthy watershed

through effective land and resource management will ensure that ecosystems continue to provide key benefits in the face of a changing climate.

Identify Corridors for Species

In anticipation of further growth in the Region, there is a need for a balance between growth of urban areas and the environment to maintain viable habitat for native plant and wildlife species, and to maintain a high quality of life for watershed residents and visitors. An effective means of establishing this balance is the development of open space corridors that allow for multiple species habitat, wetlands, storm flow capture and aquifer recharge, water quality improvements, and passive and active recreational facilities and open spaces. This strategy is currently being implemented through two habitat conservation plans by identifying corridors used by sensitive wildlife species to move from place to place.

Restore Ecosystems

Ecosystem restoration affects the return of selected ecosystems to a condition similar to their undisturbed state, directly improving habitat and open space. Some ecosystems within the Region remain undisturbed; however, much of the low-lying areas are urbanized and therefore highly disturbed. Additionally, fire suppression in the San Bernardino forest has resulted in tree overgrowth that contributes to basins being clogged with debris as mentioned above. Ecosystem restoration, where possible, will indirectly improve stormwater recharge and the preservation of flood plains, and will support climate change mitigation through the sequestration of carbon into plants and trees.

Protect Recharge Areas

The protection of recharge areas focuses on safeguarding of lands that are important locations for groundwater recharge. Natural recharge areas include stream beds and open spaces that allow water to permeate into the ground, while artificial recharge areas can include ponds or basins that collect water and allow it to permeate. These recharge areas can be protected through land use planning, land conservation and habitat protection programs. If recharge areas cease functioning properly, there may not be sufficient groundwater for storage or use.

In the Region, the United States Geological Survey (USGS) determined that most of the natural recharge occurs in the unlined streams and creeks within the San Bernardino Valley. Recharge also occurs in the flood control detention basins along the foothills. Protection of recharge areas include two primary goals: 1) ensuring that the streams, creeks, and flood control detention basins are not lined with concrete; and 2) preventing pollutants from entering groundwater to avoid expensive treatment that may be needed prior to potable, agricultural, or industrial beneficial uses.

Due to the Region's high utilization of local groundwater basins, recharge area protection is a key strategy to ensure the sustainability and reliability of the groundwater supply. Protecting recharge areas will help the Region increase utilization of the local water source and contribute to multi-use opportunities such as habitat and recreation.

Implement Agricultural Lands Stewardship

Agricultural lands stewardship protects and promotes agricultural production through integrating positive water resource management strategies into agricultural activities. This includes preserving agricultural land, maintaining and creating wildlife habitat within agricultural land, reducing land erosion and runoff pollution, removing invasive species, and creating riparian buffers. Since agriculture is not a large industry in the Region, practicing agricultural lands stewardship will provide limited benefit to the Region.

Continue Forest Management and Hazardous Fuels Reduction in Forest

SBCFCD uses the Fuels Management Program to proactively thin trees in the forest that would have historically been thinned by wildfire. This practice reduces flood risk by reducing, or eliminating, debris that runs down streams and fills debris/detention basins following wildfire. Because proactively thinning the forest is a fraction of the cost of cleaning debris, the Region should continue to proactively thin the forest to decrease the potential risk of debris inundating basins after a wildfire. Implementation of this strategy will reduce flood risk and improve the functionality of flood control basins so that more stormwater can recharge the groundwater basins and reduce sediment flowing into channels.

Effective forest management can also help the Region mitigate climate change. Maintaining healthy forested lands and woodlands can help sequester carbon from the atmosphere, reducing GHGs in the atmosphere and mitigating climate change. Wildfire risk is anticipated to increase particularly in the urban-wildland interface communities as a result of climate change. The Hazardous Fuels Reduction program can also help the Region adapt to climate change through the removal of dead, dying, and diseased trees, and any vegetation which creates a hazardous fuel for fires.

Coordinate Land Use Planning and Management with Water Resources Management

Land use planning and management uses land controls to manage, minimize, or control activities that may negatively affect the quality and availability of groundwater and surface waters, natural resources, or endangered/threatened species. More efficient and effective land use patterns promote integrated regional water management and has been incorporated into guidelines for programs such as IRWM and SGMA. Integrating land use and water management consists of planning for housing and economic development needs of a growing population while providing for the efficient use of water, water quality, energy, and other resources.

Through the land use planning and management strategy, the Region intends to work more closely with land use planning agencies to ensure that they consider and implement low impact development policies and other BMPs that improve stormwater infiltration and reduce runoff flows, as well as look for opportunities to expand recreation and public access.

Incorporate Environmental Opportunities and Constraints into the Design Process for Facilities

There may be opportunities to improve environmental resources when designing stormwater capture and recharge facilities. When possible, facilities may be designed to reduce environmental impacts and promote natural habitat.

Incorporate Opportunities to Improve Habitat and Increase Recreation and Public Access During the Facilities Design Process

The Region's expanding population means that new facilities will continue to be needed to manage water supplies. The Region has an opportunity to incorporate habitat improvement, and recreation and public access during the design process of these new facilities. This strategy will maintain and create new opportunities for the public to enjoy the area's waterways and other recreational amenities; enhance the watershed's natural features; and ensure access to the Region's wetlands, lakes, and streams.

Participate in SAWPA Basin Management Task Force

The SAWPA Basin Management Task Force compiles and collects monitoring data to evaluate water quality in the SAR and the groundwater basins. Participation in the Task Force contributes to understanding and reacting to surface and groundwater quality issues in the Region. This strategy will help the Region meet the objective to improve surface and groundwater quality and manage TDS and nitrogen in the groundwater.

People and Water

Provide Economic Incentives

Economic incentives, in the form of loans, grants, or water pricing support, are important for successful implementation of projects as a lack of adequate funds can prevent a project from moving forward. Incentives can result in lower operation costs or lower local costs of implementing a project. The economic incentives strategy can be used to help the Region meet all objectives, depending on the type of project to be implemented.

Maintain and Improve Water-Dependent Recreation

The strategy to maintain and improve water-dependent recreation seeks to enhance and protect water-dependent recreational opportunities and public access to recreational lands through water resources management. Water-dependent recreation within the Region includes opportunities to access or be alongside lakes and river corridors. This strategy is especially applicable to Big Bear Lake where people fish, swim, boat, and participate in other recreational within the reservoir.

Increase Outreach and Engagement

Effective public outreach and engagement increases public awareness of where water comes from and instills water conservation/water use efficiency as a public ethic, resulting in

decreasing demands on local and imported water supplies. Effective outreach and engagement can also prevent pollutants from entering water supplies at the source, helping the Region meet the objective to improve surface and groundwater quality.

The strategy to increase outreach and engagement can also encourage the involvement of community members in meaningful water resources and land use planning. This strategy ensures that the development of recreational and open spaces not only meets the needs of the community but is also widely supported by the general public.

Consider Water and Culture

Linking cultural considerations to water management helps project expected water demands for cultural activities and improves understanding of the perspectives that influence water conservation. This strategy can help the Region meet the objective to comply with conservation legislative requirements. Consideration of water and culture also identifies customer expectations for water quality and land use as they relate to subsistence activities, recreational activities, spiritual activities, historic preservation, public art, and lifeways.